



MACHINING AND CLAMPING TECHNOLOGY

1

Catalogue 56

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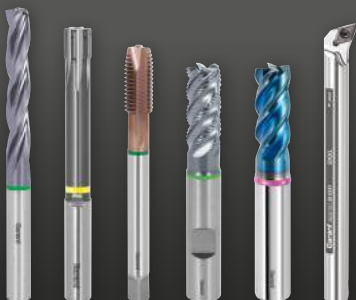


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PLANNING

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- **The quality promise:**
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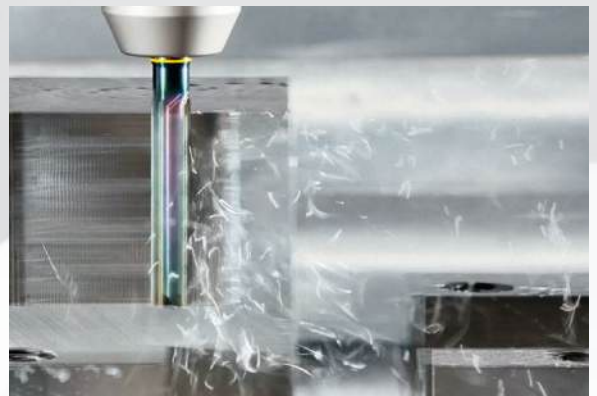
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- **A wide range:** More than 17,000 tools for every standard application.
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* 10-year warranty on materials and manufacture of GARANT products when used as intended, excluding regular wear as a result of mechanical stress and excluding workstations and storage solutions installed in containers as well as all electronic components.

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Expert knowledge from machining specialists

- Our **application technicians** are specialists for **boring, milling** and **turning**, as well as **clamping technology**.
- **Valuable expertise** on the use of high-quality cutting edge technologies and clamping technologies.
- **Innovative solutions** for improving the production process.





Garant

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- **GARANT Softcut:** high-precision shoulder mill with irregular pitch for very smooth cutting. High-performance inserts, ideal for general-purpose use in all material groups and automated production lines.
- **GARANT HB7020-2:** high-performance turning grade for machining steel, designed for maximum productivity.
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Industrial Tooling & Equipment by Hoffmann Group





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Simply clever machining

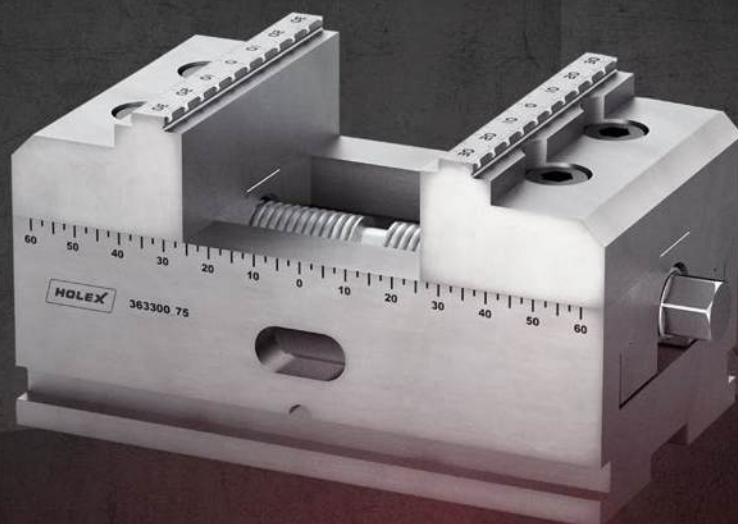
- **HOLEX Clever Tap:** Sturdy tap for conventional standard applications.
- **HOLEX Pro toolholder:** Targeted cooling on the cutting edge.
- **HOLEX centring vice:** Clamps blanks and finished parts with the least possible lifting of the jaws/component, very good accessibility and exactly symmetrical.

More than 17,000 products for day-to-day working life: HOLEX has the right products for every standard application at a great price and good industrial quality.



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- LogisticCity, **Europe's largest tool logistics centre** in Nuremberg.
- Numerous logistics sites **worldwide**.



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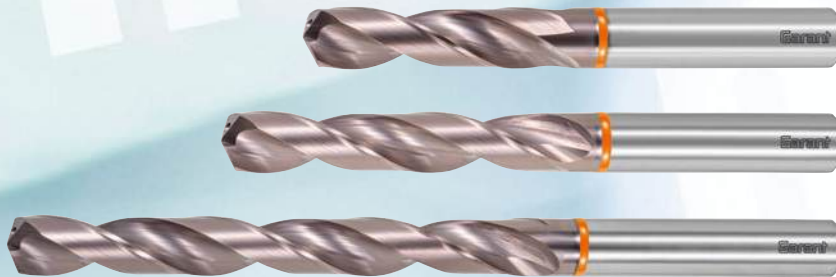
New products – Machining – Drilling

NEW

We use this symbol to tag new items
in our range of catalogue products

Group 12

Garant UNI HERO



Pages 96 / 118 / 132

GARANT Uni Hero solid carbide multi-purpose drill 4xD, 6xD and 8xD

- Maximum universality and tool efficiency.
- Convex-concave main cutting edges and special pointed tip.
- Optimised chip groove geometry and polished flutes for optimum chip evacuation.
- Ultra-smooth, latest-generation TiAlSiN high-performance coating.

Garant MASTER STEEL



Pages 135 / 142

GARANT Master Steel solid carbide high-performance drill 8xD and 12xD

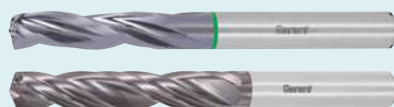
- Extremely sturdy tool design and optimised special point geometry.
- Patented face geometry for optimum chip formation and reliable chip breakage.
- Special flute geometry for reliable chip evacuation.
- High performance with a focus on steel materials.

Machining – Drilling

Machining / clamping technology
for optimal processes.
Now sorted by application drilling, tapping, milling,
turning and clamping.


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HSS Mono drilling
Technical literature,
HSS drills
Overview
page 28/29

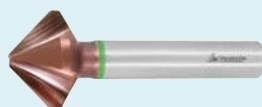
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**Solid carbide
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Member BMC Group

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Garant

Modular reaming

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Pictograms and graphics



Version										
Tool material	HSS E	High-performance tool steel with 5 % cobalt	HSS E-PM	Powder metallurgy HSS	Solid carbide	Micrograin solid carbide in the range K10-K40 and P40	HSS E-SPM	Special powder metallurgy substrate with high cobalt content		
Type	Type N	Type N = Standard		Solid carbide router cutter with high performance diamond cut	HR	Fine knuckle form		Left-hand cutting		
Standard	DIN 206 B	Satisfies DIN 206	EN 22568	Satisfies Euro Standard 22568		Manufacturer's standard	DIN 371	Satisfies DIN 371		
Shank	Solid carbide drill and milling cutter with shank DIN 6535-HA (from shank $\varnothing \geq 6$ mm) on request with drive flat HB or HE: Please note the respective instruction text concerning the desired cutting tool. Required: 1 x drill No. 122659 size 10 with HE drive flat: Ordering example: 1 pc. No. 12 2659 size 10 + 1 pc. No. 12 9100 HE Generating a drive flat: Made to order – cannot be returned.						Shank in h6 tolerance with DIN 1835-B drive flat		Tolerance h7 shank with 3 drive flats for use in a 3-jaw chuck	
Diameter/length		Nominal diameter divergent from standard Dc Semi-standard		Flute length 25x $\varnothing$ (deep hole drill)		Indexable drill 4xD				
Angle		180° Stepped tool for 180° countersink angle		90° Insert NC spotting drill 90°		60° Countersink with 60° point angle		90° Counterbore		118° point angle
		90° High-accuracy tool tolerance in the μ m range		Dynamic helical pitch		45° Corner chamfer width at 45°		Defined corner radius		Corners rounded off
Form / teeth		Special drill tip – for aramide fibres		Tool with 3 teeth		Form C		High-performance drill with 6 guide chamfers and IC		Countersinks with unequal spacing for precision counterbores
Threads		MF Metric fine threads		EG-M Metric thread for wire inserts		60° With 60° flank angle		CS 2-3 pitch chamfer lead Form C with spiral point		For through holes up to 3xD thread depth
	Note on the use of taps with coolant holes on synchronised spindles: For optimum lubrication (for longest service life and highest process reliability) using cutting oil or MQL, we recommend GARANT quick-change tapping heads with minimum quantity lubrication system and minimum length compensation (MLA) No. 33 8100 – 8121.						Voll-profil Creates a full profile			
		Dynamic. Cost-effective machining for highly demanding work.		Synchronous. Very high performance, for use on machines with synchronised spindles.		Thread mills with unequally spaced cutting edges				
Tolerance	H7	For manufacturing to fit H7	ISO 2 6H	Metric ISO threads application class 2 6H = medium tolerance	m7	Cutter $\varnothing$ tolerance m7	-0.007 +0.002	Cutter $\varnothing$ tolerance dimensioning		
Application	HPC	High Performance Cutting for very high machining volumes	MTC	Multi Task Cutting MTC tool with cutting force reduction	TPC		Trochoidal Performance Cutting A synthesis of a HPC and MTC tool			
		Pilot hole and co-pilot hole required		25 bar With internal coolant supply at 25 bar minimum pressure. For drills from 12xD a filter with 20 – 25 μm must be used in the coolant system.		Centre hole ■ Use half feed rate				
		Aperture: 1. Drill the outer holes, 2. Drill intermediate holes, offset maximum 0.8xD		Drilling through cross holes		Cross drilling ■ Use half feed rate ■ Cross bore maximum 1/3 of the bore $\varnothing$ ■ Eccentric cross bores not possible				
Balancing quality	G 2.5	G 2.5	Milling cutter with balancing quality G 2.5 maintained up to the stated speed n_{max} (as shown on the shank marking). Adequate balancing quality of the overall tooling system (arbor and tool) is important at high speeds. The diagram shows examples of the relationship between various balancing qualities and the resulting overall balancing quality.							
	Example: Arbor G 2.5 + tool G 2.5 = overall balancing quality G 1.73									
	Spindle	Arbor m = 1 kg	Tool m = 0.5 kg	Overall balancing quality at n = 30000 rpm						
Spindle mass 15 kg Balancing quality rotating parts: G 0.4	Eccentricity 2 μ m	G 2.5		G 1		G 1.68				
				G 2.5		G 1.73				
				G 6.3		G 1.84				
				G 16		G 2.14				
Note: Precondition for achieving an overall balancing quality $\leq$ G2.5 is a balanced toolholder with a balancing quality G2.5.										
For more information see machining handbook No. 11 0010										



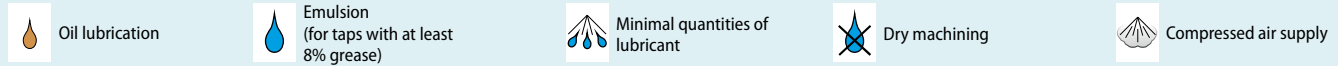
Garant ToolScout – Special application tables for mono machining

Polymer materials

easy → difficult																							
	Thermoplastics				Ther-mo	Plastics and fibres (GF / CF in %)						Sandwich		General									
Suitability/ v_c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey-comb sandwich	MMC	GRP CRP	Graphite	Uni					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N						
20 9785							200	190	170	150	180	160	●	350		190	340				●	●	●

Icons:

How the tool can be used


Copper materials

easy																							difficult				
		Machining group I						Machining group II						Machining group III													
Suitable for/ v _c [m/min]	Alu plastics <i>WZ</i>	AlCuPb AW2011 Index 50	CuZnPb CW603N Index 100	CuNiZn CW400J Index 90	CuSnZn CC493K Index 90	CuPb CW113C Index 80	CuSnPb CW458K Index 70	CuNiZn CW408J Index 60	CuZnPb CW604N Index 60	CuZnMn CW713R Index 50	CuAlFe CC333G Index 50	CuZnAl CC766S Index 40	CuBe CW101C Index 30	CuSiMn CW116C Index 30	ECu58 CW005A Index 20	ECu57 CW004A Index 20	WCu WCu80/20 Index 19	GRP CRP									
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N									
	13 2610	18	11	14	18	18	14	14	18	11	11	11			14	14				●	○						

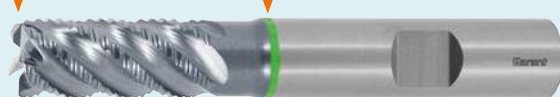
Non-ferrous / steel materials

easy → difficult																							
Assignment of the ISO code																							
Suitability/ v_c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10% Si										INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	P	P	P	P	M	M	S	K							
20 5548				200	180	160	140	110					50	35		200	●		●	○	●	●	●

$v_c = 160$ m/min
Average cutting speed
as application
recommendation

The GARANT colour code family:
Trouble-free **specification** and **application fields**
at a glance.

● / Bold script = highly suitable;
○ / Normal script = suitable only under restricted conditions



Application recommendations for all cutting tools



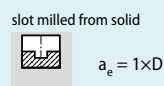
$f_z = 0.07$ mm
Average feed rate
as application recommendation
for full-slot machining, for Ø 12 mm.



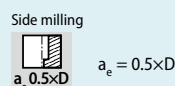
$f_z = 0.09$ mm
Average feed rate
as application recommendation
for side milling, for Ø 12 mm.

Ø d11 D _c	11X	20 5548	L _c	L	Ø D _s	Corner chamfer width at 45°		
		GARANT Master Steel SlotMachine solid carbide roughing end mill						
		HPC TiAlN						
mm			mm	mm	mm	mm	mm	mm
12		current price	16	73	12	0.6	0.07	0.09
14		current price	18	75	14	0.7	0.08	0.1

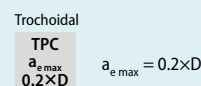
→ Lateral infeed a_e :
(respective pictograms)



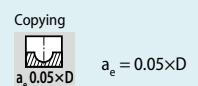
$a_e = 1 \times D$



$a_e = 0.5 \times D$



$a_{e \max} = 0.2 \times D$



$a_e = 0.05 \times D$

↓ Uniform depth of cut a_p :
(for variations see notes)



$a_p = 1 \times D$



$a_p = 1 \times D$



$a_p = L_c$



$a_p = a_e$

Note: For longer tool life and optimum results, we recommend for milling cutters with $\phi \leq 4$ mm: $a_p = 0.5 \times D$.

ISO fits and tool overview for drilling

Tolerances and fits

In addition to the general ISO standards for describing the geometric tolerancing and quality of surfaces, the **ISO system of fits** is a basic requirement for components to work smoothly together.

A distinction can be made between **general tolerances according to ISO-2768**, **ISO tolerances** and **freely tolerated dimensions**. In this case, the respective tolerances define the permissible deviations from nominal dimensions.

Zero line

Nominal dimension of the hole or shaft,
Reference value for tolerance and dimension.

Dimensional tolerance

Difference between maximum and minimum.

Basic dimension

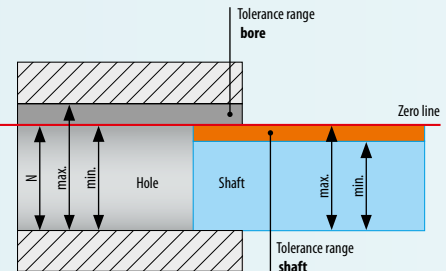
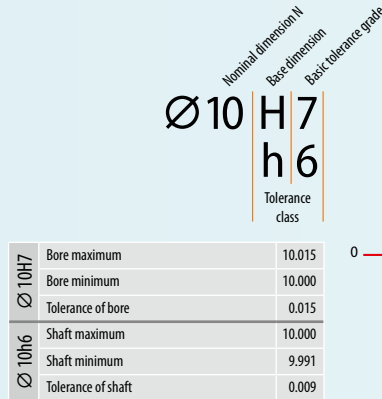
Displays the position of the tolerance zone in relation to the zero line. Example for hole **H**

Basic tolerance grade

Specifies the basic tolerance range: Example: **IT7**

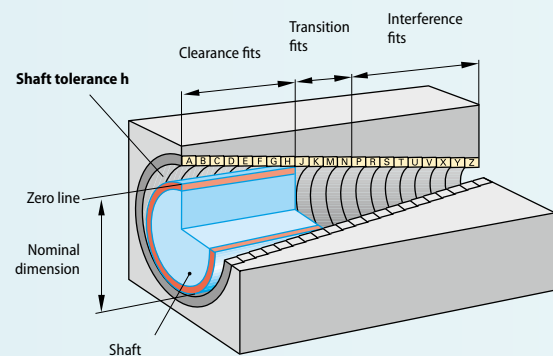
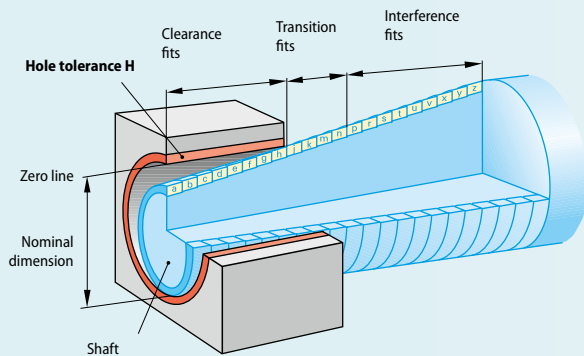
Tolerance class

Limit deviation in μm (combination of basic dimension and tolerance grade) Example: Hole **H7**



ISO system of fits, standard bore and standard shaft

Systems of fit for optimised, cost-effective production. The basic idea is to produce one of the associated workpieces in a standardised manner and to transfer the appropriate tolerance to the other workpiece. Typical applications include shaft-hub connections.



Standard bore holes system (see DIN ISO 286-1)

The tolerance for the **hole diameter** is standardised with a **H tolerance class** based on the IT Grade system. The minimum dimension of the hole goes exactly up to the zero line and the maximum dimension of the hole is limited upwards by the tolerance grade (example 10H7 - $\varnothing$ max: 10.015/ min: 10.000). A tolerance field position is selected as required for the counterpart (shaft).

Standard shaft system (see DIN ISO 286-1)

An **h tolerance class** is provided for the **shaft diameter**. The maximum dimension of the shaft goes exactly up to the zero line and the minimum dimension of the shaft is limited downwards by the tolerance grade (example 10h6 - $\varnothing$ max: 10.000/ min: 9.991). The counterpart (hole) then receives an individual tolerance zone.

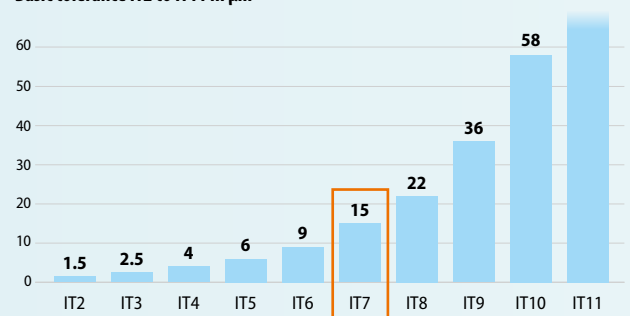
The IT basic tolerance grade

In the ISO tolerance system, the tolerance grade (e.g. IT7) defines the accuracy level (basic tolerance). The range up to IT11 is decisive for tool making and mechanical engineering.

Nominal dimension (mm)		Finish machining (grinding, lapping, honing)								Tool, machine and vehicle construction (reaming, milling, drilling, turning)						
		Basic tolerance grades														
		IT01	IT0	IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10	IT11		
More than	Up to and including	Basic tolerances														
		μm														
—	3	0.3	0.5	0.8	1.2	2	3	4	6	10	14	25	40	60		
3	6	0.4	0.6	1	1.5	2.5	4	5	8	12	18	30	48	75		
6	10	0.4	0.6	1	1.5	2.5	4	6	9	15	22	36	58	90		
10	18	0.5	0.8	1.2	2	3	5	8	11	18	27	43	70	110		
18	30	0.6	1	1.5	2.5	4	6	9	13	21	33	52	84	130		
30	50	0.6	1	1.5	2.5	4	7	11	16	25	39	62	100	160		

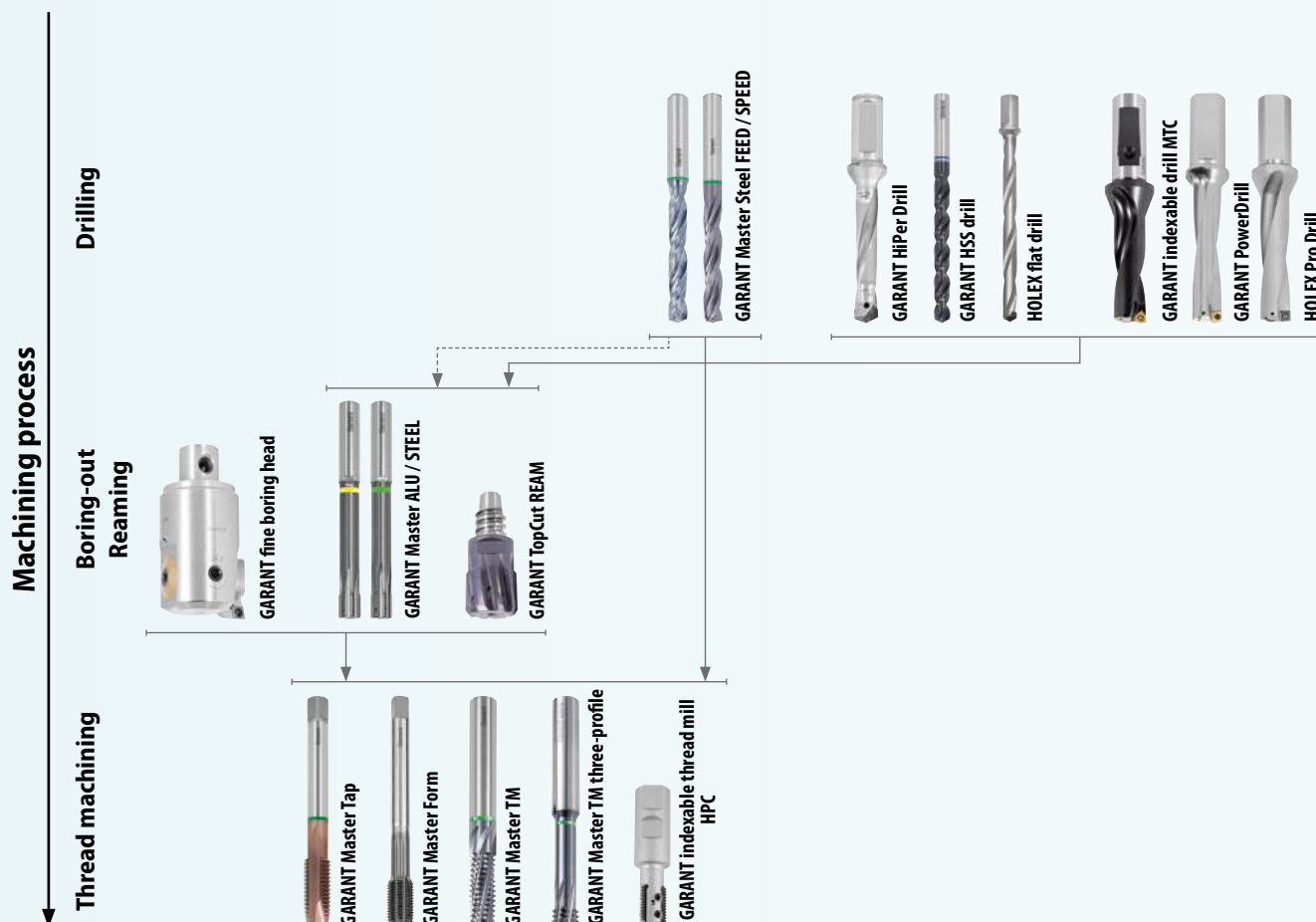
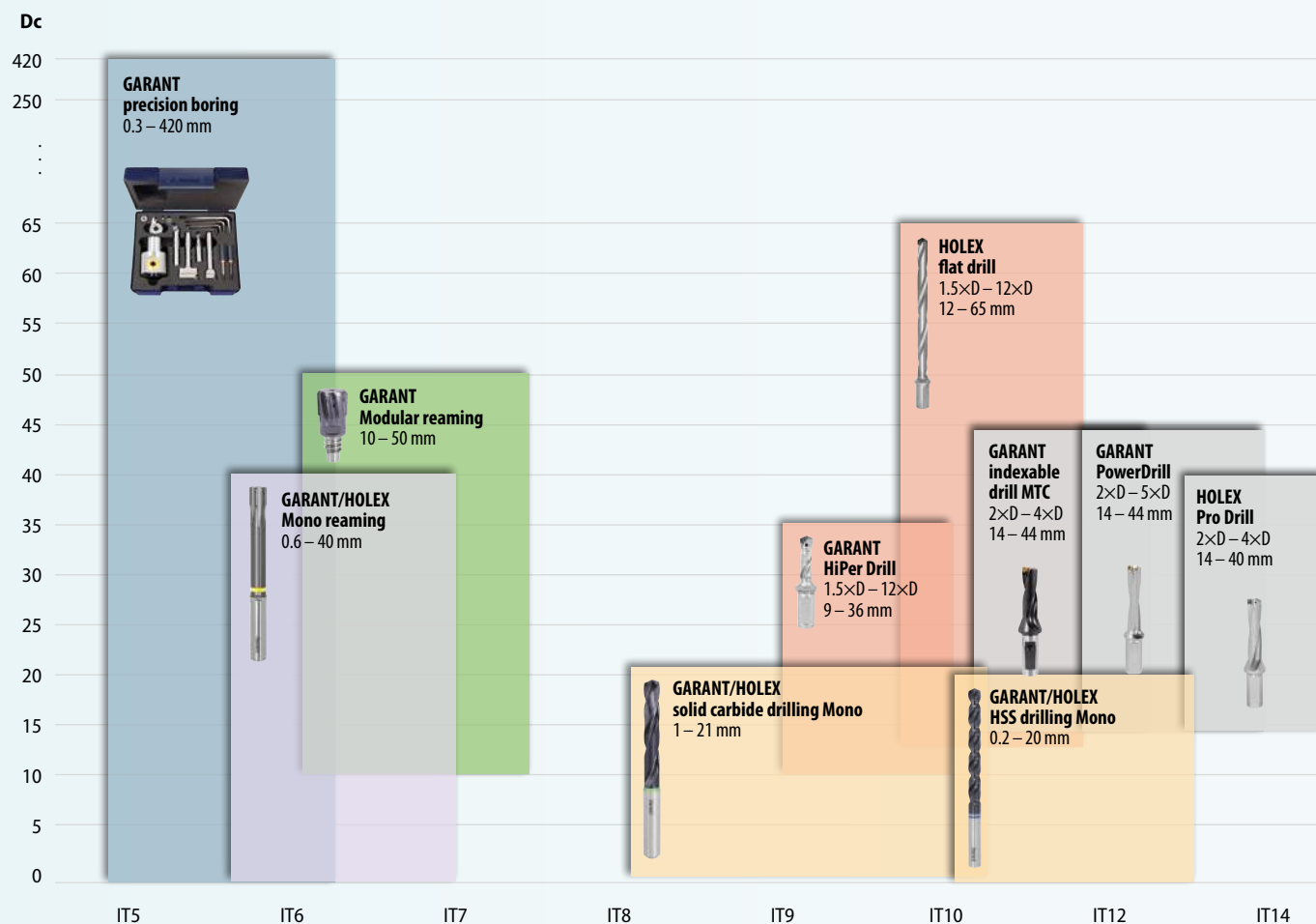
(Table: Extract from DIN ISO 286)

Basic tolerance IT2 to IT11 in μm



Example: $\varnothing > 6 - 10 \text{ mm}$ / basic tolerance grade IT7 / basic tolerance = $15 \mu\text{m}$

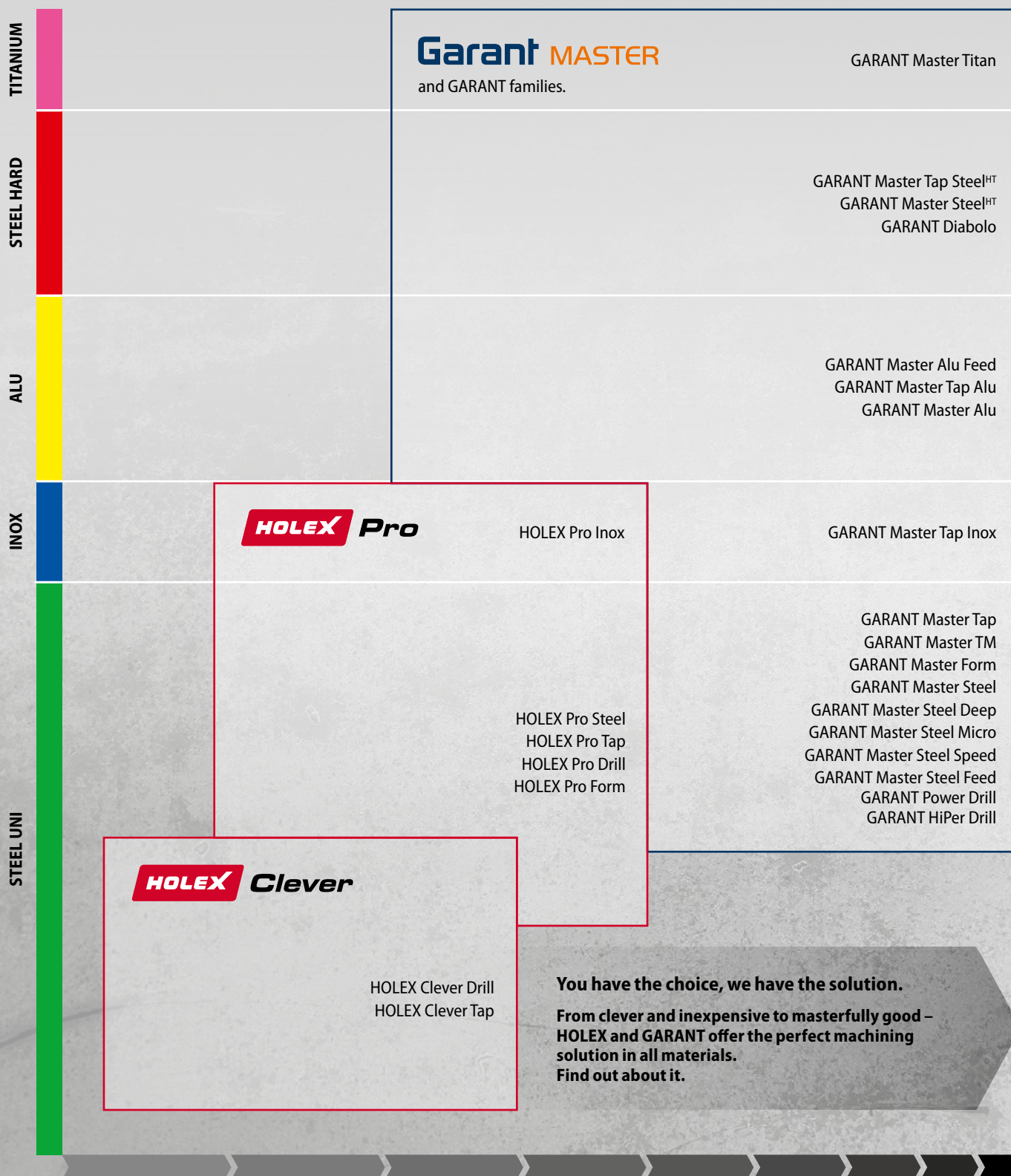
Change in accuracy level (for $\varnothing$ range $> 6 - 10 \text{ mm}$)



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The specialists

Cutter geometries that are **individually designed for demanding materials** and perfectly matched coatings ensure the highest level of process reliability in any situation.

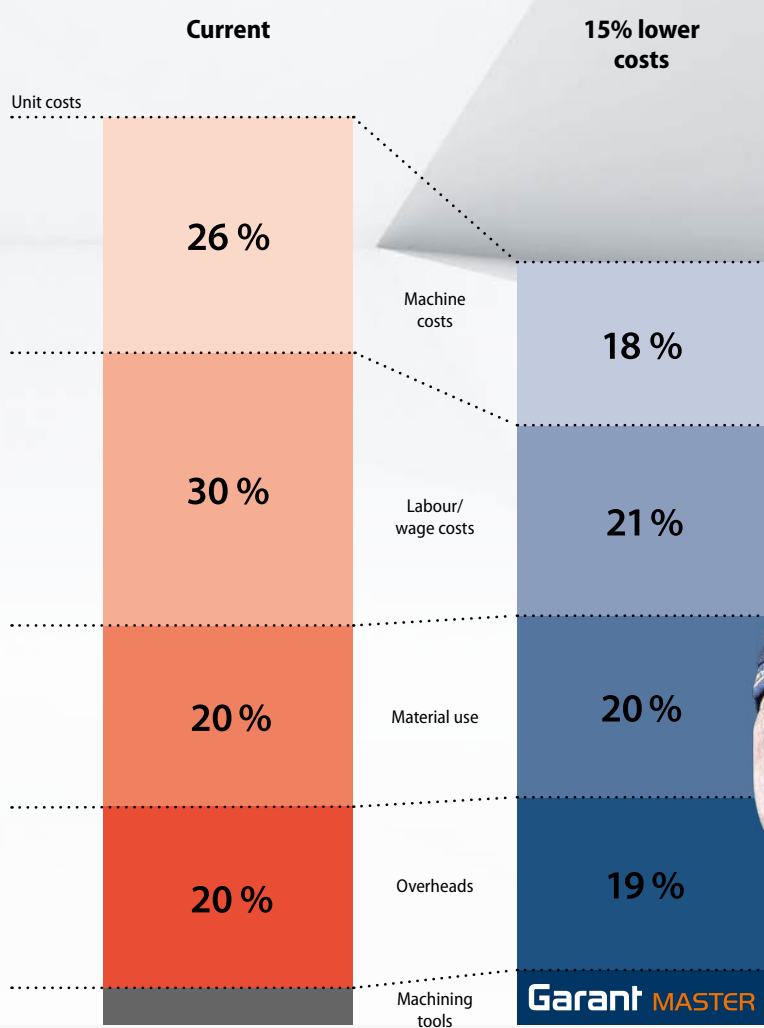


The potential applications and uses in each case are detailed on the product pages.

Garant MASTER INNOVATION THAT MAKES A REAL DIFFERENCE.

Given that the price of the tool only makes up a small proportion of the overall costs, even significant price reductions will not noticeably reduce the overall costs.

In contrast, the uncompromising dynamics of GARANT Master machining tools optimise the machining time and material use and help bring about significant improvements under corresponding operating conditions.



Standard tool without improved efficiency.

Even a 30% reduction in the tool purchase price **reduces unit costs by 1.5% at most.**

GARANT Master for maximum productivity.

GARANT Master machining tools reduce unit costs by up to 15% thanks to:

- **Longer** tool life
→ less time spent changing tools.
- **Higher** metal removal rate
→ higher productivity.
- **Improved** cutting parameters
→ more efficient machines.





Garant MASTER

- **Comprehensive range** – drilling, countersinking, reaming, thread machining and much more.
- **Protection against wear**, even at high temperatures, thanks to high-quality coatings.
- **Optimum bending strength and toughness** thanks to high-performance substrates.
- **Reliable chip evacuation and optimum metal removal rate** thanks to optimised cutting edge and flute geometries.

Garant MASTER + Automation

- Increased machine capacity thanks to additional unstaffed shifts.
- Free employees from routine tasks / no overtime in the event of order peaks.
- Reduce manufacturing costs.
- Increase profit.



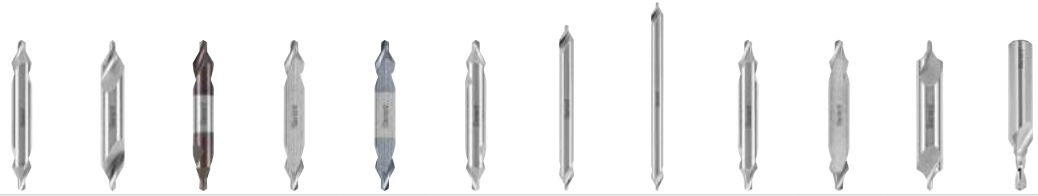
Conclusion: An additional automation solution significantly increases the potential savings once more! We would be pleased to show you how it works. **Simply contact us!**



Garant

HOLEX

Overview – HSS jobber drill range



Designation		Centre drills											
DIN >		333					Man. std			333			332/2
Item number		111000 / 111005	111050	111100	111200	111205	111250	111290	111300	111350	111450	111520	111310
Drill type		A	A	A	A (surface)	A (surface)	A / left-hand	A / long	A / long	R	R (surface)	B	A
Tool material		HSS	HSS-E	HSS-E	HSS-E	HSS-E	HSS	HSS-E	HSS-E	HSS	HSS-E	HSS	HSS-E
Coating				TiAlN		TiAlN							
Centring angle / point angle		60°	60°	60°	60°	60°	60°	60°	60°	60°	60°	120° / 60°	60°
Size range (Ø mm)		0.5 – 10	0.5 – 6.3	0.5 – 5	1.6 – 6.3	1.6 – 6.3	0.5 – 8	0.75 – 3	1 – 5	0.5 – 6.3	1.6 – 6.3	1 – 5	M3 – M12
for hand-held machines													
Page	ISO 513	30	30	30	31	31	31	31	31	32	33	33	32
Aluminium, plastics	N	●	●	●	●	●	●	●	●	●	●	●	●
Steel < 500 N/mm²	P	●	●	●	●	●	●	●	●	●	●	●	●
Steel < 900 N/mm²	P	●	●	●	●	●	●	●	●	●	●	●	●
Steel < 1400 N/mm²	P	○	●	●	●	●	○	●	●	○	●	○	●
INOX	M		●	●	●	●		●	●		●		●
Ti	S			●		●							
GG (G)	K		○	●	○	●		○	○		○		●
CuZn	N	●	●	●	●	●	●	●	●	●	●	●	●
UNI													●



Designation DIN >		Jobber drills, short			Jobber drills												
		1897			338												
Item number		113265	113341/ 113421	113001	114001	114004	114008	114000	114020	114031	114150	114200		114360	114400	114405	114450
Drill type				N	N	N	N	N	N	N	N	W		N	N	N	FS
Tool material		HSS-E	HSS	HSS-E	HSS-E	HSS	HSS-E	HSS	HSS	HSS	HSS	HSS		HSS	HSS-E	HSS-E	HSS-E
Coating		TiAlN												TiN			
Point angle		118°	135°	130°	130°	118°	118°	118°	118°	118°	118°	130°		118°	130°	135°	130°
Size range (Ø mm)		1 – 13	2.5 – 9.6	1 – 20	1 – 20	1 – 13	1 – 13	1 – 13	1 – 13	1 – 20	1 – 20	0.2 – 20	0.9 – 13	1 – 16	1 – 16	1 – 13	1 – 13
for hand-held machines			●	●	●	●	●			●		●					
Page	ISO 513	40	41	42	43	44	44	46	46	47	47	49		49	50	50	50
Aluminium, plastics	N	○	○	○	○	○	○	○	○	○	○	●		○			●
Steel < 500 N/mm²	P	●	●	●	○	●	●	●	●	●	●	●		●	○	●	●
Steel < 900 N/mm²	P	●	○	●	●	●	●	●	●	●	●	●		●	●	●	○
Steel < 1400 N/mm²	P	○		●	●		○				○			○	●	●	
INOX	M	○		○	○		●							○	○	○	
Ti	S	○												○	○		
GG (G)	K	●		○	○	●	●	○	○	○	●			●	●		●
CuZn	N			○	○	○	●			●	●			○	○		
UNI		●		●	●										●		



Designation		Jobber drills with MT shank								Stepped drills 90°						
DIN >		345		Man. std		343	341	1870		1897	8378	1897		Man. std	8374	
Item number		116340	116320	116360	116380	116620	116700	116720	116760	117020	117040	117060	117120	117140	117160	117180
Drill type		N	N	VA	H	N	N	FS	N	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS
Tool material		HSS	HSS	HSS-E	HSS-Co8	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS
Coating										vaporised	TiAlN	vaporised	vaporised	TiAlN		vaporised
Point angle		118°	118°	135°	130°	120°	118°	130°	118°	118°	118°	118°	118°	118°	118°	118°
Size range (Ø mm)		5 – 70	13 – 70	10 – 35	8.5 – 30	7.8 – 50	10 – 50	10 – 30	8 – 30	3 – 12	3 – 12	3 – 12	3 – 10	3 – 10	4 – 10	3 – 10
for hand-held machines																
Page	ISO 513	62	62	63	63	64	65	65	66	66	66	67	67	67	68	68
Aluminium, plastics	N	○				○				○	○	○	○	○	○	○
Steel < 500 N/mm²	P	●	●	●		●	●	●	●	●	●	●	●	●	●	●
Steel < 900 N/mm²	P	●	○	●		●	●	●	●	●	●	●	●	●	●	●
Steel < 1400 N/mm²	P			○	●	○					○			○		
INOX	M			●		○										
Ti	S			●	●											
GG (G)	K	●	○	●		○	●		●	●	●	●	●	●	●	●
CuZn	N			●						○	○	○	○	○	○	○
UNI																



NC spotting drills Man. std								1899/A	Jobber drills, short 1897						
112000	112020	112060	112100	112110	112160	112140		112305	113006	113020	113140	113150	113230	113260	
N	N	N	N / long	N	N / long	N		N	N	FS	FS	N	N		
HSS-E	HSS-E	HSS-E-PM	HSS-E	HSS-E	HSS-E	HSS-E		HSS-E-PM	HSS	HSS	HSS-Co8	HSS-E	HSS-E	HSS-E	
TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN					TiAIN		TiN	TiAIN	
90°	90°	90°	90°	120°	120°	142°		118°	118°	135°	130°	130°	130°	130°	
3 – 20	3 – 20	3 – 20	3 – 20	3 – 20	4 – 16	3 – 16		0.15 – 1.8	2 – 20	1 – 20	1 – 12	1 – 20	1 – 20	1 – 13	
34	34	34	34	35	35	35		36	37	38	38	39	39	40	
●	●	●	●	●	●	●		●	○	●	○	○	●	○	
●	●	●	●	●	●	●		●	●	○	●	●	●	○	
●	●	●	●	●	●	●		●	●	○	○	○	○	○	
●	●	●	●	●	●	●		●	●	○	○	○	○	○	
●	●	●	●	●	●	●		○	○	●	○	○	○	○	
●	●	●	●	●	●	●		●	●	●	○	○	○	○	
●	●	●	●	●	●	●		●	●	●	○	○	○	○	



Jobber drills, long 340												Jobber drills, extra long 1869						1898A
114500	114550	114580	114610	114620	116000	116040	116051	116061	116063	116065	116070	116240	116245	116250	116280	116285	116310	
HSS-E	HSS-Co8	HSS-E	HSS-E-PM	HSS-E-PM	N	W	N	FS	FS	N	VA	FS	N	FS	FS	N		
TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	HSS	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS	
130°	135°	118°	130°	130°	118°	130°	118°	130°	130°	118°	130°	130°	118°	130°	135°	118°	118°	
1 – 13	1 – 13	1 – 13	1 – 13	2 – 13	0.6 – 16	2.5 – 10	2 – 16	1 – 14	1 – 13	1 – 12	1 – 12	2.5 – 12	2 – 12	2.5 – 10.2	3 – 10.2	3 – 10	3 – 12	
51	51	52	53	53	57	57	57	58	58	59	59	60	60	60	61	61	61	
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	



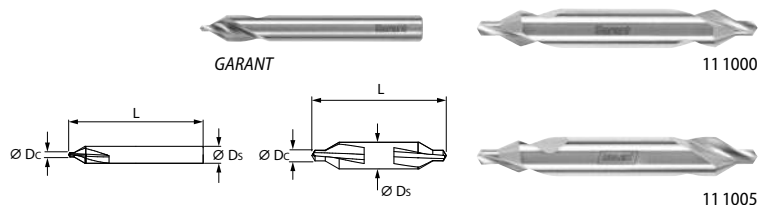
Stepped drills 180° 1897				Taper sheet and tube drills Man. std			Stepped drills Man. std		Hole saws / core drills Man. std						
117240	117260	117280	117320	118020	118030	118040	118320	118324	118400 – 118505	118782	118792	118802 / 118822	119000	119010	
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS	Carbide	35 mm Carbide	30 mm HSS	30 / 55 mm HSS	35 mm Carbide	25 mm HSS	
vaporised	TiAIN	vaporised	vaporised		TiN	TiAIN		TiAIN		TiAIN		TiAIN			
118°	118°	118°	118°												
3 – 10	3 – 10	3 – 10	5 – 20	3 – 60	3 – 60	4 – 30.5	4 – 60	4 – 40	16 – 120	14 – 26	12 – 50	12 – 50	12 – 65	12 – 32	
69	69	69	69	70	70	70	71	71	72	73	73	73	74	74	
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	



Centre drill

Ground from solid and relief ground, spiral fluted.

Size 0,5; 0,8 – Single-ended.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
11 1000/1005	70	45	40	30	25	10	8									80						

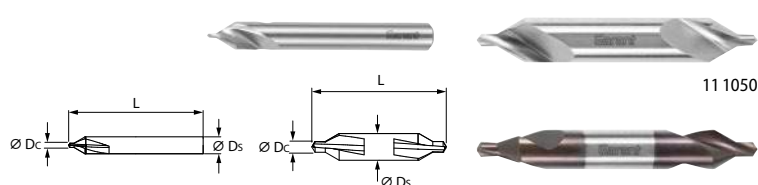
Nominal Ø D _c k12	11A 11 1000 Garant	12A 11 1005 HOLEX	for workpiece Ø	Ø D _s	L	f mm/rev.
mm	Centre drill A		mm	mm	mm	
0,5	eShop	eShop	< 4	3.15	25	0.01
0,8	eShop	—	4 – 6	3.15	25	0.01
1	eShop	eShop	6 – 8	3.15	31.5	0.02
1,25	eShop	eShop	8 – 10	3.15	31.5	0.02
1,6	eShop	eShop	10 – 15	4	35.5	0.02
2	eShop	eShop	15 – 20	5	40	0.02
2,5	eShop	eShop	20 – 30	6.3	45	0.03
3,15	eShop	eShop	30 – 40	8	50	0.03
4	eShop	eShop	40 – 63	10	56	0.03
5	eShop	eShop	63 – 100	12.5	63	0.04
6,3	eShop	eShop	100 – 150	16	71	0.05
8	eShop	eShop	150 – 250	20	80	0.06
10	eShop	eShop	> 250	25	100	0.09



Garant Centre drill

Ground from solid and relief ground, spiral fluted.

Size 0,5 – Single-ended.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 1050	70	45	40	40	30	25	10	8					12	8	5	25	80					
11 1100	70	45	40	40	30	25	10	8					12	8	5	25	80					

Nominal Ø D _c k12	11A 11 1050 Centre drill HSS-E	12A 11 1100 TiAlN	for workpiece Ø	Ø D _s	L	f mm/rev.
mm	A		mm	11 1050 mm	11 1100 mm	
0,5	eShop	eShop	< 4	3.15	3.15	0.01
0,75	eShop	eShop	4 – 6	3.5	3.5	0.01
1	eShop	eShop	6 – 8	4	3.15	0.02
1,5	eShop	eShop	8 – 15	5	5	0.02
1,6	eShop	eShop	10 – 15	4	4	0.02
2	eShop	eShop	15 – 20	6	5	0.02
2,5	eShop	eShop	20 – 30	8	6.3	0.03
3	eShop	eShop	20 – 40	8	8	0.03
3,15	eShop	eShop	30 – 40	8	8	0.03
4	eShop	eShop	40 – 63	10	10	0.03
5	eShop	eShop	63 – 100	12	12	0.04
6,3	eShop	—	100 – 150	16	—	0.05



Garant Set of centre drills in a case

Composed of centre drills DIN 333.

Content:

11 1055 – Centre drill No. 111050, 1 pc. each in size 0.75; 1; 1.5; 1.6; 2; 2.5; 3; 3.15; 4; 5.

11 1060 – Centre drill No. 111100, 1 pc. each in size 0.75; 1; 1.5; 1.6; 2; 2.5; 3; 3.15; 4; 5.

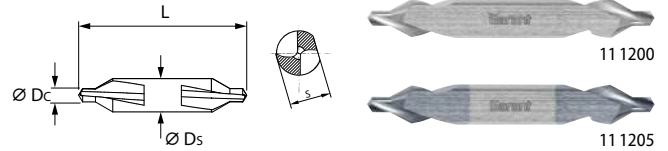
Number of drills			10
11A	11 1055	Centre drill set HSS-E No. 111050 in a case	eShop 
11A	11 1060	Centre drill set HSS-E No. 111100 in a case	TiAlN eShop 
Number of drills			10





Garant Centre drill with flat

Ground from solid and relief ground, spiral fluted.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 1200	70	45		40	30	25	10	8						12	8		25	80	●	●			
11 1205	70	45	40	40	30	25	10	8						12	8	5	25	80	●	●			

Nominal Ø D _c k12	11 1200	11 1205	Ø D _s	s – 0.1	L	f
mm	mm	mm	mm	mm	mm	mm/rev.
1,6	eShop	eShop	4	3.25	35	0.02
2	eShop	eShop	5	4.2	40	0.02
2,5	eShop	eShop	6.3	5.35	45	0.03
3,15	eShop	eShop	8.3	6.95	50	0.03

Nominal Ø D _c k12	11 1200	11 1205	Ø D _s	s – 0.1	L	f
mm	mm	mm	mm	mm	mm	mm/rev.
4	eShop	eShop	10	8.4	55	0.03
5	eShop	eShop	12.5	10.95	63	0.04
6,3	eShop	eShop	16	14	71	0.05

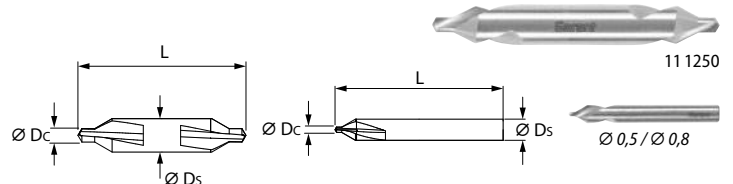


Garant Centre drill, left-hand cutting

Ground from solid and relief-ground.

Left-hand cutting, spiral fluted.

Size 0,5–0,8 – Single-ended.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
11 1250	70	45		40	30	25	10	8									80		●	●			

Nominal Ø D _c k12	11 1250	for workpiece Ø	Ø D _s	L	f
mm	mm	mm	mm	mm	mm/rev.
0,5	eShop	< 4	3.15	25	0.01
0,8	eShop	4 – 6	3.15	25	0.01
1	eShop	6 – 8	3.15	31.5	0.02
1,25	eShop	8 – 10	3.15	31.5	0.02
1,6	eShop	10 – 15	4	35.5	0.02
2	eShop	15 – 20	5	40	0.02

Nominal Ø D _c k12	11 1250	for workpiece Ø	Ø D _s	L	f
mm	mm	mm	mm	mm	mm/rev.
2,5	eShop	20 – 30	6.3	45	0.03
3,15	eShop	30 – 40	8	50	0.03
4	eShop	40 – 63	10	56	0.03
5	eShop	63 – 100	12.5	63	0.04
6,3	eShop	100 – 150	16	71	0.05
8	eShop	150 – 250	20	80	0.06



Garant Long and extra long centre drills

Ground from solid and relief-ground.

Spiral fluted, extra long shank, similar to DIN 333-A.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 1290/1300	70	45		40	30	25	10	8						12	8		25	80	●	●			

Nominal Ø D _c k12	11 1290	11 1300	for workpiece Ø	Ø D _s	L	f
mm	mm	mm	mm	mm	mm	mm/rev.
0,75	eShop	–	< 6	3.5	60	–
1	eShop	eShop	6 – 8	4	60	120
1,5	eShop	–	8 – 15	5	60	–
1,6	–	eShop	10	5	–	120
2	eShop	eShop	15 – 20	6	80	120

Nominal Ø D _c k12	11 1290	11 1300	for workpiece Ø	Ø D _s	L	f
mm	mm	mm	mm	mm	mm	mm/rev.
2,5	eShop	eShop	20 – 30	8	80	120
3	eShop	–	20 – 40	8	80	–
3,15	–	eShop	30 – 40	10	–	120
4	–	eShop	40 – 63	10	–	120
5	–	eShop	63 – 100	14	–	120

HSS E	DIN 332/2	Type A	0 -0.05	60°	h7
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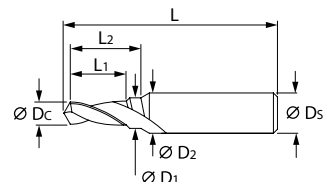
Garant Stepped centre drill for tapping hole, 60°

Stepped centre drill for tapping holes to Form A.

For **combined production** of centring, entry chamfer and tapping hole **all in a single operation**.



11 1310



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 1310	65	65	60	28	30	30	9	7						7			28	35	●	●			

for threads	11 1310					Ø D _c	Ø D ₁ ±0.05	Ø D ₂	L ₁	L ₂	for workpiece Ø	Ø D _s	L	 f
	Stepped centre drill for tapping holes HSS-E													
	A					mm	mm	mm	mm	mm	mm	mm	mm	mm/rev.
M3	eShop					2.5	3.2	6	8	9	30 – 40	6	55	0.03
M4	eShop					3.3	4.3	8	11	12.6	40 – 63	8	63	0.05
M5	eShop					4.2	5.3	10	13	15.1	63 – 100	10	67	0.07
M6	eShop					5	6.4	12.5	16	18.9	100 – 150	12.5	71	0.1
M8	eShop					6.8	8.4	14	19	23	150 – 180	14	88	0.12
M10	eShop					8.5	10.5	16	23	27.7	180 – 210	16	90	0.15
M12	eShop					10.2	13	20	28	34.5	210 – 250	20	105	0.2

HSS	DIN 333	Type R	k12	60°	h7
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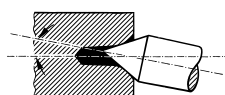
Garant Centre drill

Ground from solid and relief ground, spiral fluted.

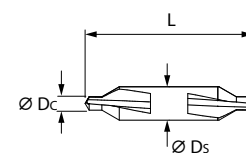
Centre drill with radius form R:

- The radius curve eliminates the sharp transition from drill point to countersink angle that is present on form A, so the risk of fracture is reduced.
- In the event of angular misalignment of the lathe centre, the ring bearing face avoids the component running only on the external or internal edge of the bearing face. Even if the lathe centres are not in line, good support is provided.

Size 0,5–0,8 – Single-ended.



11 1350



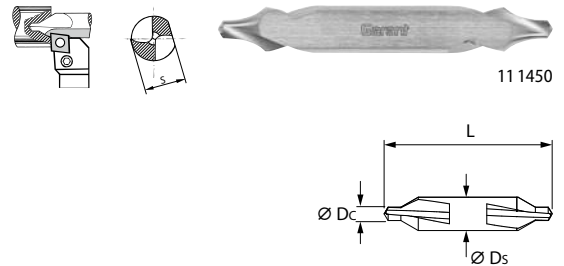
Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	Ti	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
11 1350	70	45		40	30	25	10	8									80		●	●			

Nominal Ø D _c k12	11A	11 1350	for workpiece Ø	Ø D _s	L	 < 900 N f
mm	Centre drill HSS R		mm	mm	mm	mm/rev.
0,5	eShop		< 4	3.15	25	0.01
0,8	eShop		4 – 6	3.15	25	0.01
1	eShop		6 – 8	3.15	31.5	0.02
1,25	eShop		8 – 10	3.15	31.5	0.02
1,6	eShop		10 – 15	4	35.5	0.02
2	eShop		15 – 20	5	40	0.02
2,5	eShop		20 – 30	6.3	45	0.03
3,15	eShop		30 – 40	8	50	0.03
4	eShop		40 – 63	10	56	0.03
5	eShop		63 – 100	12.5	63	0.04
6.3	eShop		100 – 150	16	71	0.05



Garant Centre drill with flat

Ground from solid and relief ground, spiral fluted.
Features of centre drills with radius form R: See No. 111350.



11 1450

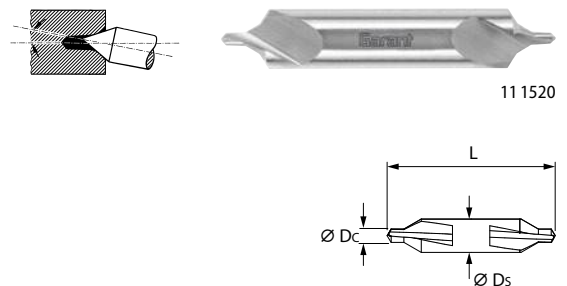
Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 1450	70	45	40	30	25	10	8						12	8		25	80					

Nominal $\varnothing D_c$ k12	11A	11 1450	for workpiece $\varnothing$	$\varnothing D_s$	s – 0.1	L	 f
mm		R with flat	mm	mm	mm	mm	mm/rev.
1,6		eShop	10 – 15	4	3.25	35.5	0.02
2		eShop	15 – 20	5	4.2	40	0.02
2,5		eShop	20 – 30	6.3	5.35	45	0.03
3,15		eShop	30 – 40	8	6.95	50	0.03
4		eShop	40 – 63	10	8.4	55	0.03
5		eShop	63 – 100	12.5	10.95	63	0.04
6,3		eShop	100 – 150	16	14	71	0.05



Garant Centre drill with protective countersink

Ground from solid and relief-ground.
With additional centre protection (120° countersink angle), spiral fluted.



11 1520

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
11 1520	70	45	40	30	25	10	8									80						

Nominal $\varnothing D_c$ k12	11A	11 1520	for workpiece $\varnothing$	$\varnothing D_s$	L	 f
mm		B	mm	mm	mm	mm/rev.
1		eShop	6 – 8	4	35	0.02
1,25		eShop	8 – 10	5	40	0.02
1,6		eShop	10 – 15	6.3	45	0.02
2		eShop	15 – 20	8	50	0.02
2,5		eShop	20 – 30	10	56	0.03
3,15		eShop	30 – 40	11.2	60	0.03
4		eShop	40 – 63	14	67	0.03
5		eShop	63 – 100	18	76	0.04



11



Garant NC spotting drill plain shank

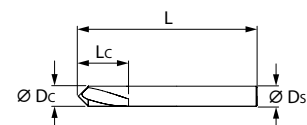
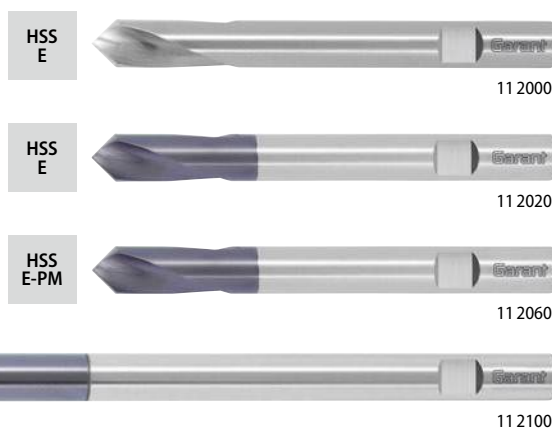
≥ Ø 6 mm with **drive flat to DIN 1835-B**.

Precision centred ground point with thin chisel edge - gives easy spot drilling and high accuracy of the centre hole form. Very sturdy due to short flutes.

11 2060 – **High-performance NC spotting drill.**

Tool substrate made of sintered powder metallurgy **for applications** demanding high standards of tool life and accurate centring. Very good wear resistance in stainless steels.

Note: Use speed for the actual hole Ø (not necessarily the speed for the drill outer Ø).



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	St < 500 N	St < 750 N	St < 900 N	St < 1100 N	St < 1400 N	St < 55 HRC	St < 60 HRC	St < 65 HRC	St < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni	Oil	Water	Emulsion	High Pressure	High Speed
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
11 2000	70	45	50	40	30	25	10	8					12	8	5	3	80	•	•	•	•	•	•
11 2020/2100	87	56	50	50	37	31	12	10					15	10	6	31	100	•	•	•	•	•	•
11 2060	96	62	55	55	42	35	14	12					18	13	8	35	112	•	•	•	•	•	•

Ø D _c h6	TiA 11 2000	TiA 11 2020	TiA 11 2060	TiA 11 2100	L _c	L	Ø D _s	f
	NC spotting drill HSS-E			NC spotting drill HSS-E-PM				
	90° N							
mm		TiAlN	TiAlN	TiAlN	mm	mm	mm	mm/rev.
3	eShop	eShop	eShop	eShop	12	46	80	3
4	eShop	eShop	eShop	eShop	12	55	100	4
5	eShop	eShop	eShop	eShop	15	60	120	5
6	eShop	eShop	eShop	eShop	20	66	140	6
8	eShop	eShop	eShop	eShop	25	79	140	8
10	eShop	eShop	eShop	eShop	25	89	170	10
12	eShop	eShop	eShop	eShop	30	102	170	12
16	eShop	eShop	eShop	eShop	35	115	200	16
20	eShop	eShop	eShop	eShop	40	131	200	20



Garant NC spotting drill sets

With **drive flats to DIN 1835-B**.

Precision centred ground point with thin chisel edge – gives easy spot drilling and high accuracy of the centre hole form. Very sturdy due to short flutes.

Supplied with: 4-piece set of NC spotting drills in a plastic box.

Note: Use speed for the actual hole Ø (not generally the speed for the drill outer Ø).



Type		6-12
TiA 11 2107	NC spotting drill HSS-E No. 112000 with plastic box 90°	eShop
TiA 11 2108	NC spotting drill HSS-E No. 112020 with plastic box 90°	TiAlN eShop
Content:	1 each NC spotting drills	Size 6; 8; 10; 12.



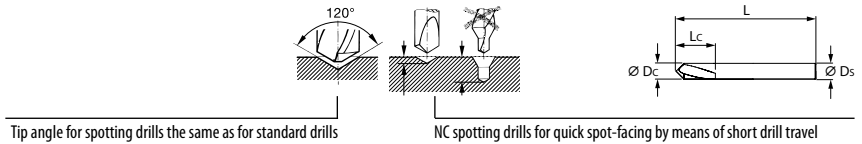
Garant NC spotting drill plain shank

≥ Ø 6 mm with drive flat to DIN 1835-B.

Precision centred ground point with thin chisel edge - gives easy spot drilling and high accuracy of the centre hole form. Very sturdy due to short flutes.

Application: Point angle 120° so that the cutting edges of the following drill engage easily.

Note: Use speed for the actual hole Ø (not necessarily the speed for the drill outer Ø).



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
11 2110/2160	87	56	50	50	37	31	12	10					15	10	6	31	100						

Ø D _c h6	TIA	11 2110	TIA	11 2160	L _c	L	Ø D _s	f
		NC spotting drill HSS-E						
		120° N						
mm		TiAlN		TiAlN	mm	11 2110 mm	11 2160 mm	mm/rev.
3		eShop		—	12	46	—	0.03
4		eShop		eShop	12	55	100	0.04
5		eShop		eShop	15	60	120	0.04
6		eShop		eShop	20	66	140	0.04
8		eShop		eShop	25	79	140	0.05
10		eShop		eShop	25	89	170	0.06
12		eShop		eShop	30	102	170	0.06
16		eShop		eShop	35	115	200	0.07
20		eShop		—	40	131	—	0.07



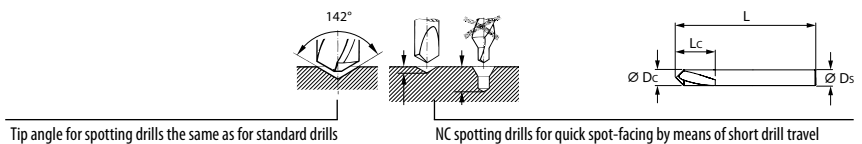
Garant NC spotting drill plain shank

≥ Ø 6 mm with drive flat to DIN 1835-B.

Precision centred ground point with thin chisel edge - gives easy spot drilling and high accuracy of the centre hole form. Very sturdy due to short flutes.

Application: Point angle 142° so that the cutting edges of the following drill engage easily.

Note: Use speed for the actual hole Ø (not necessarily the speed for the drill outer Ø).



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
11 2140	87	56	50	50	37	31	12	10					15	10	6	31	100						

Ø D _c h6	TIA	11 2140	L _c	L	Ø D _s	f
		NC spotting drill HSS-E				
		142° N				
mm		TiAlN	mm	mm	mm	mm/rev.
3		eShop	12	46	3	0.03
4		eShop	12	55	4	0.04
5		eShop	15	60	5	0.04
6		eShop	20	66	6	0.04
8		eShop	25	79	8	0.05
10		eShop	25	89	10	0.06
12		eShop	30	102	12	0.06
16		eShop	35	115	16	0.07

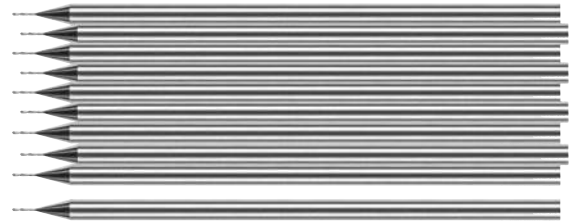
HSS E-PM	DIN 1899 A	Type N	0 -0.004	 118°		
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Garant Micro drill

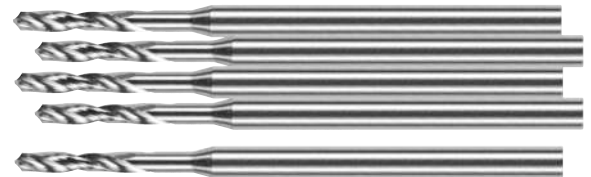
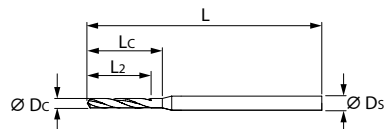
Special drill with reinforced shank, high concentricity and precision ground point.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



11 2305_0,15



11 2305_1,00

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
11 2305	70	45	40	40	30	25	10	8					12	8	5	25	80	○	●	●			

Ø D _c -0.004	11A	11 2305	Number of drills	L _c	L	Ø D _s	 f
mm		N		mm	mm	mm	mm/rev.
0,15		eShop	10	1	25	1	0.006
0,20		eShop	5	1.8	25	1	0.007
0,25		eShop	5	2.2	25	1	0.009
0,30		eShop	5	2.2	25	1	0.011
0,35		eShop	5	2.8	25	1	0.011
0,40		eShop	5	3.6	25	1	0.011
0,45		eShop	5	3.6	25	1	0.011
0,50		eShop	5	4	25	1	0.014
0,55		eShop	5	4.5	25	1	0.014
0,60		eShop	5	4.5	25	1	0.014
0,65		eShop	5	5	25	1	0.02
0,70		eShop	5	5.6	25	1	0.02
0,75		eShop	5	5.6	25	1	0.02
0,80		eShop	5	6.3	25	1.5	0.024
0,85		eShop	5	6.3	25	1.5	0.024
0,90		eShop	5	7.1	25	1.5	0.024
0,95		eShop	5	7.1	25	1.5	0.024
1,00		eShop	5	8	25	1.5	0.041
1,05		eShop	5	8	25	1.5	0.041
1,10		eShop	5	9	25	1.5	0.041
1,15		eShop	5	9	25	1.5	0.041
1,20		eShop	5	10	25	1.5	0.041
1,25		eShop	5	10	25	1.5	0.041
1,30		eShop	5	10	25	1.5	0.041
1,35		eShop	5	11.2	25	1.5	0.041
1,40		eShop	5	11.2	25	1.5	0.041
1,45		eShop	5	11.2	25	1.5	0.041
1,50		eShop	5	11.2	30	2	0.052
1,55		eShop	5	12.4	30	2	0.052
1,70		eShop	5	12.4	30	2	0.052
1,80		eShop	5	13.8	30	2	0.052



HOLEX HOLEX CleverDrill jobber drill, plain shank

Sturdy drills for all standard applications. Improved spot drilling behaviour due to cross-ground form. Standard core thickness and core taper. Profile ground. Surface: Bronze-coloured tempered helical flutes.

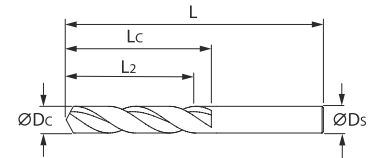
Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$

Note: Successor product to No. 11 3005.



11 3006



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX	INOX	Ti	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 3006	80	63	50	35	32	25	20										30	40					

Ø D _c h8	12B 11 3006		L _c	L	f
mm	HOLEX CleverDrill HSS jobber drill		mm	mm	mm/rev.
2	eShop	10	12	38	0.05
2,1	eShop	10	12	38	0.05
2,2	eShop	10	13	40	0.05
2,3	eShop	10	13	40	0.05
2,4	eShop	10	14	43	0.05
2,5	eShop	10	14	43	0.05
2,6	eShop	10	14	43	0.05
2,7	eShop	10	16	46	0.05
2,8	eShop	10	16	46	0.05
2,9	eShop	10	16	46	0.05
3	eShop	10	16	46	0.05
3,1	eShop	10	18	49	0.05
3,2	eShop	10	18	49	0.05
3,3	eShop	10	18	49	0.05
3,4	eShop	10	20	52	0.05
3,5	eShop	10	20	52	0.05
3,6	eShop	10	20	52	0.05
3,7	eShop	10	20	52	0.05
3,8	eShop	10	22	55	0.05
3,9	eShop	10	22	55	0.05
4	eShop	10	22	55	0.05
4,1	eShop	10	22	55	0.05
4,2	eShop	10	22	55	0.05
4,3	eShop	10	24	58	0.05
4,4	eShop	10	24	58	0.05
4,5	eShop	10	24	58	0.05
4,6	eShop	10	24	58	0.05
4,7	eShop	10	24	58	0.05
4,8	eShop	10	26	62	0.05
4,9	eShop	10	26	62	0.05
5	eShop	10	26	62	0.08
5,1	eShop	10	26	62	0.08
5,2	eShop	10	26	62	0.08
5,3	eShop	10	26	62	0.08
5,4	eShop	10	28	66	0.08
5,5	eShop	10	28	66	0.08
5,6	eShop	10	28	66	0.08
5,7	eShop	10	28	66	0.08
5,8	eShop	10	28	66	0.08
5,9	eShop	10	28	66	0.08
6	eShop	10	28	66	0.08
6,1	eShop	10	31	70	0.08
6,2	eShop	10	31	70	0.08
6,3	eShop	10	31	70	0.08
6,4	eShop	10	31	70	0.08
6,5	eShop	10	31	70	0.08
6,6	eShop	10	31	70	0.08
6,7	eShop	10	31	70	0.08
6,8	eShop	10	34	74	0.08
6,9	eShop	10	34	74	0.08
7	eShop	10	34	74	0.08

Ø D _c h8	12B 11 3006		L _c	L	f
mm	HOLEX CleverDrill HSS jobber drill		mm	mm	mm/rev.
7,1	eShop	10	34	74	0.08
7,2	eShop	10	34	74	0.08
7,3	eShop	10	34	74	0.08
7,4	eShop	10	34	74	0.08
7,5	eShop	10	34	74	0.08
7,6	eShop	5	37	79	0.08
7,7	eShop	5	37	79	0.08
7,8	eShop	5	37	79	0.08
7,9	eShop	5	37	79	0.08
8	eShop	5	37	79	0.1
8,1	eShop	5	37	79	0.1
8,2	eShop	5	37	79	0.1
8,3	eShop	5	37	79	0.1
8,4	eShop	5	37	79	0.1
8,5	eShop	5	37	79	0.1
8,6	eShop	5	40	84	0.1
8,7	eShop	5	40	84	0.1
8,8	eShop	5	40	84	0.1
8,9	eShop	5	40	84	0.1
9	eShop	5	40	84	0.1
9,1	eShop	5	40	84	0.1
9,2	eShop	5	40	84	0.1
9,3	eShop	5	40	84	0.1
9,4	eShop	5	40	84	0.1
9,5	eShop	5	40	84	0.1
9,7	eShop	5	43	89	0.1
9,8	eShop	5	43	89	0.1
10	eShop	5	43	89	0.1
10,2	eShop	5	43	89	0.1
10,5	eShop	5	43	89	0.1
11	eShop	5	47	95	0.1
11,5	eShop	5	47	95	0.1
11,8	eShop	5	47	95	0.1
12	eShop	5	51	102	0.16
12,5	eShop	5	51	102	0.16
13	eShop	5	51	102	0.16
13,5	eShop	5	54	107	0.16
13,8	eShop	5	54	107	0.16
14	eShop	5	54	107	0.16
14,5	eShop	5	56	111	0.16
15	eShop	5	56	111	0.16
15,5	eShop	1	58	115	0.16
16	eShop	1	58	115	0.2
16,5	eShop	1	60	119	0.2
17	eShop	1	60	119	0.2
17,5	eShop	1	62	123	0.2
18	eShop	1	62	123	0.2
18,5	eShop	1	64	127	0.2
19	eShop	1	64	127	0.2
19,5	eShop	1	66	131	0.2
20	eShop	1	66	131	0.2



11



Garant Stub drill plain shank

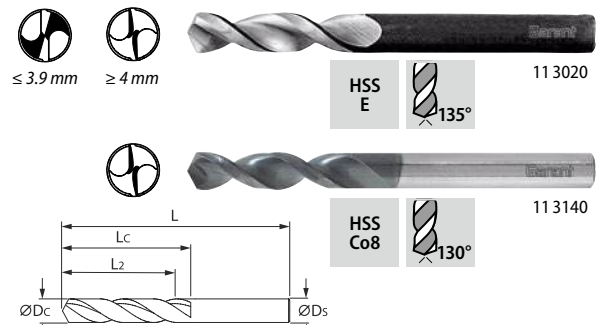
Particularly **robust and strong** due to **strengthened core**.
Ground flutes, with high concentricity.

11 3020 – Bright finish flutes, nitrided lands.

Advantage: **Ideal for drilling shallow holes (approx. 2 - 4×D)**
on NC machines and automatic machines.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 3020	70	45	40	30	30	30	30	30	30	30	30	30	30	15	10	6	25						
11 3140	87	56	50	50	35	30	12																

Ø D _c h8	11 3020	11 3140		L _c	L		Ø D _c h8	11 3020	11 3140		L _c	L	
mm	Stub drill HSS-E	Stub drill HSS-Co8		mm	mm	mm/rev.	mm	Stub drill HSS-E	Stub drill HSS-Co8		mm	mm	mm/rev.
1	eShop	TiAlN	10	6	26	0.03	7,3	eShop	eShop	10	34	74	0.07
1,1	eShop	eShop	10	7	28	0.03	7,4	eShop	—	10	34	74	0.07
1,2	eShop	eShop	10	8	30	0.03	7,45	eShop	—	10	34	74	0.07
1,3	eShop	eShop	10	8	30	0.03	7,5	eShop	eShop	10	34	74	0.07
1,4	eShop	eShop	10	9	32	0.03	7,6	eShop	—	5	37	79	0.07
1,5	eShop	eShop	10	9	32	0.03	7,7	eShop	eShop	5	37	79	0.07
1,6	eShop	eShop	10	10	34	0.03	7,8	eShop	eShop	5	37	79	0.07
1,7	eShop	eShop	10	10	34	0.03	7,9	eShop	eShop	5	37	79	0.07
1,8	eShop	eShop	10	11	36	0.03	8	eShop	eShop	5	37	79	0.1
1,9	eShop	eShop	10	11	36	0.03	8,1	eShop	eShop	5	37	79	0.1
2	eShop	eShop	10	12	38	0.03	8,2	eShop	eShop	5	37	79	0.1
2,1	eShop	eShop	10	12	38	0.03	8,3	eShop	eShop	5	37	79	0.1
2,2	eShop	eShop	10	13	40	0.03	8,4	eShop	eShop	5	37	79	0.1
2,3	eShop	eShop	10	13	40	0.03	8,5	eShop	eShop	5	37	79	0.1
2,4	eShop	eShop	10	14	43	0.03	8,6	eShop	eShop	5	40	84	0.1
2,5	eShop	eShop	10	14	43	0.03	8,7	eShop	eShop	5	40	84	0.1
2,6	eShop	eShop	10	14	43	0.03	8,8	eShop	eShop	5	40	84	0.1
2,7	eShop	eShop	10	16	46	0.03	8,9	eShop	—	5	40	84	0.1
2,8	eShop	eShop	10	16	46	0.03	9	eShop	eShop	5	40	84	0.1
2,9	eShop	eShop	10	16	46	0.03	9,1	eShop	eShop	5	40	84	0.1
3	eShop	eShop	10	16	46	0.03	9,2	eShop	—	5	40	84	0.1
3,1	eShop	eShop	10	18	49	0.03	9,25	eShop	—	5	40	84	0.1
3,2	eShop	eShop	10	18	49	0.03	9,3	eShop	—	5	40	84	0.1
3,3	eShop	eShop	10	18	49	0.03	9,4	eShop	eShop	5	40	84	0.1
3,4	eShop	eShop	10	20	52	0.03	9,5	eShop	eShop	5	40	84	0.1
3,5	eShop	eShop	10	20	52	0.03	9,6	eShop	—	5	43	89	0.1
3,6	eShop	eShop	10	20	52	0.03	9,7	eShop	—	5	43	89	0.1
3,7	eShop	eShop	10	20	52	0.03	9,8	eShop	eShop	5	43	89	0.1
3,8	eShop	eShop	10	22	55	0.03	9,9	eShop	eShop	5	43	89	0.1
3,9	eShop	eShop	10	22	55	0.03	10	eShop	eShop	5	43	89	0.1
4	eShop	eShop	10	22	55	0.05	10,1	eShop	—	5	43	89	0.1
4,1	eShop	eShop	10	22	55	0.05	10,2	eShop	eShop	5	43	89	0.1
4,2	eShop	eShop	10	22	55	0.05	10,3	eShop	—	5	43	89	0.1
4,3	eShop	eShop	10	24	58	0.05	10,5	eShop	—	5	43	89	0.1
4,4	eShop	eShop	10	24	58	0.05	10,8	eShop	—	5	47	95	0.1
4,5	eShop	eShop	10	24	58	0.05	11	eShop	eShop	5	47	95	0.1
4,6	eShop	eShop	10	24	58	0.05	11,2	eShop	—	5	47	95	0.1
4,65	eShop	—	10	24	58	0.05	11,3	eShop	—	5	47	95	0.1
4,7	eShop	eShop	10	24	58	0.05	11,5	eShop	eShop	5	47	95	0.1
4,8	eShop	eShop	10	26	62	0.05	11,8	eShop	eShop	5	47	95	0.1
4,9	eShop	eShop	10	26	62	0.05	12	eShop	eShop	5	51	102	0.16
5	eShop	eShop	10	26	62	0.05	12,5	eShop	—	5	51	102	0.16
5,1	eShop	eShop	10	26	62	0.05	12,8	eShop	—	5	51	102	0.16
5,2	eShop	eShop	10	26	62	0.05	13	eShop	—	5	51	102	0.16
5,3	eShop	eShop	10	26	62	0.05	13,3	eShop	—	5	54	107	0.16
5,4	eShop	eShop	10	28	66	0.05	13,5	eShop	—	5	54	107	0.16
5,5	eShop	eShop	10	28	66	0.05	13,8	eShop	—	5	54	107	0.16
5,6	eShop	eShop	10	28	66	0.05	14	eShop	—	5	54	107	0.16
5,7	eShop	eShop	10	28	66	0.05	14,5	eShop	—	5	56	111	0.16
5,8	eShop	eShop	10	28	66	0.05	14,8	eShop	—	5	56	111	0.16
5,9	eShop	eShop	10	28	66	0.05	15	eShop	—	5	56	111	0.16
6	eShop	eShop	10	28	66	0.07	15,3	eShop	—	5	58	115	0.16
6,1	eShop	eShop	10	31	70	0.07	15,5	eShop	—	5	58	115	0.16
6,2	eShop	eShop	10	31	70	0.07	15,75	eShop	—	5	58	115	0.16
6,3	eShop	eShop	10	31	70	0.07	16	eShop	—	1	58	115	0.2
6,4	eShop	eShop	10	31	70	0.07	16,5	eShop	—	1	60	119	0.2
6,5	eShop	eShop	10	31	70	0.07	17	eShop	—	1	60	119	0.2
6,6	eShop	eShop	10	31	70	0.07	17,5	eShop	—	1	62	123	0.2
6,7	eShop	eShop	10	31	70	0.07	17,75	eShop	—	1	62	123	0.2
6,8	eShop	eShop	10	34	74	0.07	18	eShop	—	1	62	123	0.2
6,9	eShop	eShop	10	34	74	0.07	18,5	eShop	—	1	64	127	0.2
7	eShop	eShop	10	34	74	0.07	19	eShop	—	1	64	127	0.2
7,1	eShop	eShop	10	34	74	0.07	19,5	eShop	—	1	66	131	0.2
7,2	eShop	eShop	10	34	74	0.07	19,75	eShop	—	1	66	131	0.2
							20	eShop	—	1	66	131	0.2



Garant Stub drill plain shank

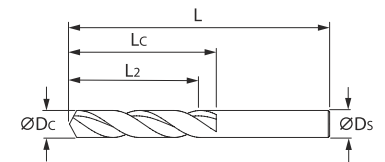
Particularly robust and strong due to strengthened core.
Ground flutes, with high concentricity.

11 3150 – Bright finish.

Advantage: Ideal for drilling shallow holes (approx. 2 - 4×D) on NC machines and automatic machines.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



11 3150



11 3230

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
11 3150	80	45	50	40	30	25	10	8					12	8	5	25	80						
11 3230				50	37	31	12	10					15	10	6	31	100						

Ø D _c h8	11B 11 3150	11B 11 3230		L _c	L	f
	Stub drill HSS-E					
mm	N	TiN		mm	mm	mm/rev.
1	eShop	eShop	10	6	26	0.03
1,1	eShop	eShop	10	7	28	0.03
1,2	eShop	eShop	10	8	30	0.03
1,3	eShop	eShop	10	8	30	0.03
1,4	eShop	eShop	10	9	32	0.03
1,5	eShop	eShop	10	9	32	0.03
1,6	eShop	eShop	10	10	34	0.03
1,7	eShop	eShop	10	10	34	0.03
1,8	eShop	eShop	10	11	36	0.03
1,85	—	eShop	10	11	36	0.03
1,9	eShop	eShop	10	11	36	0.03
2	eShop	eShop	10	12	38	0.03
2,1	eShop	eShop	10	12	38	0.03
2,2	eShop	eShop	10	13	40	0.03
2,3	eShop	eShop	10	13	40	0.03
2,4	eShop	eShop	10	14	43	0.03
2,5	eShop	eShop	10	14	43	0.03
2,6	eShop	eShop	10	14	43	0.03
2,7	eShop	eShop	10	16	46	0.03
2,8	eShop	eShop	10	16	46	0.03
2,9	eShop	eShop	10	16	46	0.03
3	eShop	eShop	10	16	46	0.03
3,1	eShop	eShop	10	18	49	0.03
3,2	eShop	eShop	10	18	49	0.03
3,3	eShop	eShop	10	18	49	0.03
3,4	eShop	eShop	10	20	52	0.03
3,5	eShop	eShop	10	20	52	0.03
3,6	eShop	eShop	10	20	52	0.03
3,7	eShop	eShop	10	20	52	0.03
3,8	eShop	eShop	10	22	55	0.03
3,9	eShop	eShop	10	22	55	0.03
4	eShop	eShop	10	22	55	0.05
4,1	eShop	eShop	10	22	55	0.05
4,2	eShop	eShop	10	22	55	0.05
4,3	eShop	eShop	10	24	58	0.05
4,4	eShop	eShop	10	24	58	0.05
4,5	eShop	eShop	10	24	58	0.05
4,6	eShop	eShop	10	24	58	0.05
4,65	eShop	eShop	10	24	58	0.05
4,7	eShop	eShop	10	24	58	0.05
4,8	eShop	eShop	10	26	62	0.05
4,9	eShop	eShop	10	26	62	0.05
5	eShop	eShop	10	26	62	0.05
5,1	eShop	eShop	10	26	62	0.05
5,2	eShop	eShop	10	26	62	0.05
5,3	eShop	eShop	10	26	62	0.05
5,4	eShop	eShop	10	28	66	0.05
5,5	eShop	eShop	10	28	66	0.05
5,55	eShop	eShop	10	28	66	0.05
5,6	eShop	eShop	10	28	66	0.05
5,7	eShop	eShop	10	28	66	0.05
5,8	eShop	eShop	10	28	66	0.05
5,9	eShop	eShop	10	28	66	0.05
6	eShop	eShop	10	28	66	0.07
6,1	eShop	eShop	10	31	70	0.07
6,2	eShop	eShop	10	31	70	0.07
6,3	eShop	eShop	10	31	70	0.07
6,4	eShop	eShop	10	31	70	0.07
6,5	eShop	eShop	10	31	70	0.07
6,6	eShop	eShop	10	31	70	0.07
6,7	eShop	eShop	10	31	70	0.07

Ø D _c h8	11B 11 3150	11B 11 3230		L _c	L	f
	Stub drill HSS-E					
mm	N	TiN		mm	mm	mm/rev.
6,8	eShop	eShop	10	34	74	0.07
6,9	eShop	eShop	10	34	74	0.07
7	eShop	eShop	10	34	74	0.07
7,1	eShop	eShop	10	34	74	0.07
7,2	eShop	eShop	10	34	74	0.07
7,3	eShop	eShop	10	34	74	0.07
7,4	eShop	eShop	10	34	74	0.07
7,45	eShop	eShop	10	34	74	0.07
7,5	eShop	eShop	10	34	74	0.07
7,6	eShop	eShop	5	37	79	0.07
7,7	eShop	eShop	5	37	79	0.07
7,8	eShop	eShop	5	37	79	0.07
7,9	eShop	eShop	5	37	79	0.07
8	eShop	eShop	5	37	79	0.1
8,1	eShop	eShop	5	37	79	0.1
8,2	eShop	eShop	5	37	79	0.1
8,3	eShop	eShop	5	37	79	0.1
8,4	eShop	eShop	5	37	79	0.1
8,5	eShop	eShop	5	37	79	0.1
8,6	eShop	eShop	5	40	84	0.1
8,7	eShop	eShop	5	40	84	0.1
8,8	eShop	eShop	5	40	84	0.1
8,9	eShop	eShop	5	40	84	0.1
9	eShop	eShop	5	40	84	0.1
9,1	eShop	eShop	5	40	84	0.1
9,2	eShop	eShop	5	40	84	0.1
9,25	eShop	eShop	5	40	84	0.1
9,3	eShop	eShop	5	40	84	0.1
9,4	eShop	eShop	5	40	84	0.1
9,5	eShop	eShop	5	40	84	0.1
9,6	eShop	eShop	5	43	89	0.1
9,7	eShop	eShop	5	43	89	0.1
9,8	eShop	eShop	5	43	89	0.1
9,9	eShop	eShop	5	43	89	0.1
10	eShop	eShop	5	43	89	0.1
10,2	eShop	eShop	5	43	89	0.1
10,5	eShop	eShop	5	43	89	0.1
11	eShop	eShop	5	47	95	0.1
11,5	eShop	eShop	5	47	95	0.1
11,8	eShop	eShop	5	47	95	0.1
12	eShop	eShop	5	51	102	0.16
12,5	eShop	eShop	5	51	102	0.16
13	eShop	eShop	5	51	102	0.16
13,5	eShop	eShop	5	54	107	0.16
13,8	eShop	eShop	5	54	107	0.16
14	eShop	eShop	5	54	107	0.16
14,5	eShop	eShop	5	56	111	0.16
15	eShop	eShop	5	56	111	0.16
15,5	eShop	eShop	5	58	115	0.16
15,75	eShop	eShop	5	58	115	0.16
16	eShop	eShop	1	58	115	0.2
16,5	eShop	eShop	1	60	119	0.2
17	eShop	eShop	1	60	119	0.2
17,5	eShop	eShop	1	62	123	0.2
17,75	eShop	eShop	1	62	123	0.2
18	eShop	eShop	1	62	123	0.2
18,5	eShop	eShop	1	64	127	0.2
19	eShop	eShop	1	64	127	0.2
19,5	eShop	eShop	1	66	131	0.2
19,75	eShop	eShop	1	66	131	0.2
20	eShop	eShop	1	66	131	0.2



11

HSS
EDIN
1897

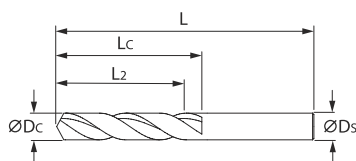
h8

**Garant High performance stub drills**

High concentricity and special chip flutes ensure precise bores.

Advantage: Ideal for drilling shallow holes (approx. 2 - 4×D) on NC machines and automatic machines.**Recommendation:** Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



11 3260



11 3265



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
11 3260	75	65	60	50	37	31	12	16					17	13	6	40	100						
11 3265				50	40	35	16						17	13	8	40	50						

Ø D _c h8	11B 11 3260	11B 11 3265		L _c	L	INOX < 900 N
mm	TiAlN	TiAlN		mm	mm	f mm/rev.
1	eShop	eShop	10	6	26	0.02
1,1	eShop	eShop	10	7	28	0.02
1,2	eShop	eShop	10	8	30	0.02
1,3	eShop	eShop	10	8	30	0.02
1,4	eShop	eShop	10	9	32	0.02
1,5	eShop	eShop	10	9	32	0.02
1,6	eShop	eShop	10	10	34	0.02
1,7	eShop	eShop	10	10	34	0.02
1,8	eShop	eShop	10	11	36	0.02
1,9	eShop	eShop	10	11	36	0.02
2	eShop	eShop	10	12	38	0.02
2,1	eShop	eShop	10	12	38	0.02
2,2	eShop	eShop	10	13	40	0.02
2,3	eShop	eShop	10	13	40	0.02
2,4	eShop	eShop	10	14	43	0.02
2,5	eShop	eShop	10	14	43	0.02
2,6	eShop	eShop	10	14	43	0.02
2,7	eShop	eShop	10	16	46	0.02
2,8	eShop	eShop	10	16	46	0.02
2,9	eShop	eShop	10	16	46	0.02
3	eShop	eShop	10	16	46	0.02
3,1	eShop	eShop	10	18	49	0.02
3,2	eShop	eShop	10	18	49	0.02
3,3	eShop	eShop	10	18	49	0.02
3,4	eShop	eShop	10	20	52	0.02
3,5	eShop	eShop	10	20	52	0.02
3,6	eShop	eShop	10	20	52	0.02
3,7	eShop	eShop	10	20	52	0.02
3,8	eShop	eShop	10	22	55	0.02
3,9	eShop	eShop	10	22	55	0.02
4	eShop	eShop	10	22	55	0.03
4,1	eShop	eShop	10	22	55	0.03
4,2	eShop	eShop	10	22	55	0.03
4,3	eShop	eShop	10	24	58	0.03
4,4	eShop	eShop	10	24	58	0.03
4,5	eShop	eShop	10	24	58	0.03
4,6	eShop	eShop	10	24	58	0.03
4,65	eShop	—	10	24	58	0.03
4,7	eShop	eShop	10	24	58	0.03
4,8	eShop	eShop	10	26	62	0.03
4,9	eShop	eShop	10	26	62	0.03
5	eShop	eShop	10	26	62	0.04
5,1	eShop	eShop	10	26	62	0.04
5,2	eShop	eShop	10	26	62	0.04
5,3	eShop	eShop	10	26	62	0.04
5,4	eShop	eShop	10	28	66	0.04
5,5	eShop	eShop	10	28	66	0.04
5,55	eShop	—	10	28	66	0.04
5,6	eShop	eShop	10	28	66	0.04
5,7	eShop	eShop	10	28	66	0.04
5,8	eShop	eShop	10	28	66	0.04
5,9	eShop	eShop	10	28	66	0.04
6	eShop	eShop	10	28	66	0.05
6,1	eShop	eShop	10	31	70	0.05
6,2	eShop	eShop	10	31	70	0.05

Ø D _c h8	11B 11 3260	11B 11 3265		L _c	L	INOX < 900 N
mm	TiAlN	TiAlN		mm	mm	f mm/rev.
6,3	eShop	eShop	10	31	70	0.05
6,4	eShop	eShop	10	31	70	0.05
6,5	eShop	eShop	10	31	70	0.05
6,6	eShop	eShop	10	31	70	0.05
6,7	eShop	eShop	10	31	70	0.05
6,8	eShop	eShop	10	34	74	0.05
6,9	eShop	eShop	10	34	74	0.05
7	eShop	eShop	10	34	74	0.05
7,1	eShop	eShop	10	34	74	0.05
7,2	eShop	eShop	10	34	74	0.05
7,3	eShop	eShop	10	34	74	0.05
7,4	eShop	eShop	10	34	74	0.05
7,45	eShop	—	10	34	74	0.05
7,5	eShop	eShop	10	34	74	0.05
7,6	eShop	eShop	5	37	79	0.05
7,7	eShop	eShop	5	37	79	0.05
7,8	eShop	eShop	5	37	79	0.05
7,9	eShop	eShop	5	37	79	0.05
8	eShop	eShop	5	37	79	0.09
8,1	eShop	eShop	5	37	79	0.09
8,2	eShop	eShop	5	37	79	0.09
8,3	eShop	eShop	5	37	79	0.09
8,4	eShop	eShop	5	37	79	0.09
8,5	eShop	eShop	5	37	79	0.09
8,6	eShop	eShop	5	40	84	0.09
8,7	eShop	eShop	5	40	84	0.09
8,8	eShop	eShop	5	40	84	0.09
8,9	eShop	eShop	5	40	84	0.09
9	eShop	eShop	5	40	84	0.09
9,1	eShop	eShop	5	40	84	0.09
9,2	eShop	eShop	5	40	84	0.09
9,25	eShop	—	5	40	84	0.09
9,3	eShop	eShop	5	40	84	0.09
9,4	eShop	eShop	5	40	84	0.09
9,5	eShop	eShop	5	40	84	0.09
9,6	eShop	eShop	5	43	89	0.09
9,7	eShop	eShop	5	43	89	0.09
9,8	eShop	eShop	5	43	89	0.09
9,9	eShop	eShop	5	43	89	0.09
10	eShop	eShop	5	43	89	0.09
10,1	—	eShop	5	43	89	0.09
10,2	eShop	eShop	5	43	89	0.09
10,3	eShop	eShop	5	43	89	0.09
10,4	—	eShop	5	43	89	0.09
10,5	eShop	eShop	5	43	89	0.09
11	eShop	eShop	5	47	95	0.09
11,2	—	eShop	5	47	95	0.09
11,5	eShop	eShop	5	47	95	0.09
11,8	eShop	eShop	5	47	95	0.09
12	eShop	eShop	5	51	102	0.13
12,1	eShop	—	5	51	102	0.13
12,3	—	eShop	5	51	102	0.13
12,5	eShop	eShop	5	51	102	0.13
12,7	—	eShop	5	51	102	0.13
13	eShop	eShop	5	51	102	0.13



HOLEX Sheet metal drill plain shank

Extremely break-resistant due to short helix and strong core taper. Self-centring point. **Cylindrically ground on circumference** (without chamfers) to prevent jamming.

Vaporised surface.

Dimensions similar to DIN 1897.

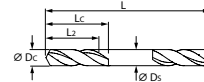
Application: Especially for drilling sheet metal.



Drill positioning without centre punching.



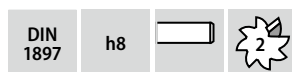
No material deformation due to easy drilling without pressure.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	Alu cast < 65 HRC	Alu cast < 67 HRC	Alu cast < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
11 3341/3421	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Ø D _c h8	12B 11 3341	12B 11 3421		L _c	L	Ø D _c h8	12B 11 3341	12B 11 3421		L _c	L
	Sheet metal drill HSS						Sheet metal drill HSS				
mm	single-sided	double-sided		mm	mm	mm	single-sided	double-sided		mm	mm
2,5	eShop	—	10	10	43	4,9	eShop	—	10	17	62
3	eShop	eShop	10	11	46	5	eShop	eShop	10	17	62
3,1	eShop	eShop	10	12	49	5,1	eShop	—	10	17	62
3,2	eShop	eShop	10	12	49	5,2	eShop	—	10	17	62
3,3	eShop	eShop	10	12	49	5,7	eShop	—	10	19	66
3,5	eShop	eShop	10	13	52	6	eShop	eShop	10	19	66
4	eShop	eShop	10	14	55	6,4	eShop	—	10	21	70
4,1	eShop	eShop	10	14	55	6,8	eShop	eShop	10	23	72
4,2	eShop	eShop	10	14	55	7,2	eShop	—	5	24	74
4,5	—	eShop	10	16	58	8,1	eShop	—	5	25	79
4,8	eShop	—	10	17	62	9,6	eShop	—	5	25	89

Sets of stub drills DIN 1897 in a case



Type	1-10
12B 11 3515 HOLEX HOLEX CleverDrill stub drill set HSS No. 113006, type N in a case	eShop
11B 11 3520 Garant Stub drill set HSS-E No. 113020, type FS with case	eShop
11B 11 3540 Stub drill set HSS-Co8 No. 113140, type FS with case	TiAlN eShop
Drill range	mm 1 – 10
Number of drills	19
Incremental steps of drills	mm 0.5



Type	1-10	1-10,5	1-13
11B 11 3730 Garant Stub drill set HSS-E No. 113150, type N as a refill set, without case	eShop	eShop	eShop
11B 11 3740 Stub drill set HSS-E No. 113230, type N with case	TiN eShop	—	—
Drill range	mm 1 – 10	mm 1 – 10.5	mm 1 – 13
Number of drills	19	24	121
Tapping hole Ø	mm —	mm 3.3; 4.2; 6.8; 10.2	mm —
Incremental steps of drills	mm 0.5	mm 0.5	mm 0.1



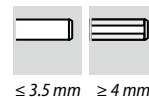
Type	1-10
11B 11 3760 Stub drill set HSS-E No. 113260, with case	TiAlN eShop
11B 11 3780 Garant Stub drill set HSS-E No. 113265, with case	TiAlN eShop
11B 11 3790 Stub drill set HSS-E No. 113265, refill set without a case	TiAlN eShop
Drill range	mm 1 – 10
Number of drills	19
Incremental steps of drills	mm 0.5

Empty case suitable for stub drills to DIN 1897

Type	1-10
12B 11 3825 HOLEX Empty case for stub drills to DIN 1897	eShop
11B 11 3830 Garant Empty case for stub drills to DIN 1897	eShop
for drills	mm 1 – 10
for number of drills	19
Incremental steps of drills	mm 0.5



11



Garant Stub drill, plain shank with 3 clamping faces

Stable and sturdy stub drill with **strengthened core diameter**.
Ground flutes, with high concentricity. Precision ground point.

Recommendation: Maximum drilling depth:

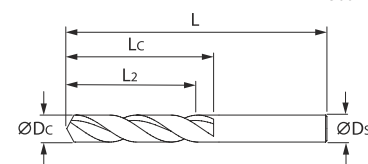
$$L_2 = L_c - 1.5 \times D_c$$

Note:

- Size 1–3,5 – Drills with plain shank, **without drive flats**.
- Size 4–20 – Three **drive flats on the shank** for use in a 3-jaw chuck.
- Size 13,5–16 – Shank Ø 9.5mm.
- Size 17–20 – Shank Ø 12.5mm.



11 3001



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
11 3001	70	45	40	40	30	25	10	8						12	8	25	80	●	●	●			

Ø D _c h8	11B 11 3001		L _c	L	f	Ø D _c h8	11B 11 3001		L _c	L	f
mm	Stub drill with 3 clamping faces HSS-E		mm	mm	mm/rev.	mm	Stub drill with 3 clamping faces HSS-E		mm	mm	mm/rev.
1	eShop	10	6	26	0.03	9	eShop	5	40	84	0.1
1,5	eShop	10	9	32	0.03	9,5	eShop	5	40	84	0.1
1,6	eShop	10	10	34	0.03	10	eShop	5	43	89	0.1
2	eShop	10	12	38	0.03	10,2	eShop	5	43	89	0.1
2,5	eShop	10	14	43	0.03	10,5	eShop	5	43	89	0.1
3	eShop	10	16	46	0.03	11	eShop	5	47	95	0.1
3,3	eShop	10	18	49	0.03	11,5	eShop	5	47	95	0.1
3,5	eShop	10	20	52	0.03	12	eShop	5	51	102	0.16
4	eShop	10	22	55	0.05	12,5	eShop	5	51	102	0.16
4,2	eShop	10	22	55	0.05	13	eShop	5	51	102	0.16
4,5	eShop	10	24	58	0.05	13,5	eShop	1	54	107	0.16
5	eShop	10	26	62	0.05	14	eShop	1	54	107	0.16
5,5	eShop	10	28	66	0.05	14,5	eShop	1	56	111	0.16
6	eShop	10	28	66	0.07	15	eShop	1	56	111	0.16
6,5	eShop	10	31	70	0.07	15,5	eShop	1	56	111	0.16
6,8	eShop	10	34	74	0.07	16	eShop	1	58	115	0.2
7	eShop	10	34	74	0.07	17	eShop	1	60	119	0.2
7,5	eShop	10	34	74	0.07	18	eShop	1	62	123	0.2
8	eShop	5	37	79	0.1	19	eShop	1	64	127	0.2
8,5	eShop	5	37	79	0.1	20	eShop	1	66	131	0.2



Garant Stub drill set, plain shank with 3 clamping faces

Composed of jobber drills DIN 1897.

Note: Ø 1 – 3.5 mm: Drills with plain shank, **without drive flats**.
Ø 4 – 10 mm: Drill with plain shank and 3 drive flats.

Type	1-10
11B 11 3010	eShop
Drill range	mm 1 – 10
Number of drills	19
Incremental steps of drills	mm 0.5



11 3010

Further accessories

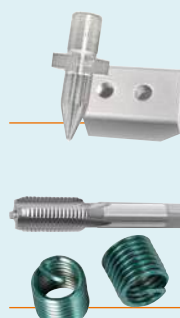
Our portfolio additions in the area of **manual drilling**, **flow drilling** as well as **thread repairs** can be found in catalogue volume 2 (Hand tools and Metrology) as well as in the eShop.



Drills for stone, concrete and wood in volume 2 section 78 Gripping, cutting, and striking tools.



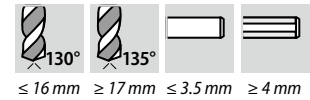
Cordless and mains-powered equipment for a wide range of drilling applications in volume 2 area 07 Power Tools & Workshop Accessories.



Flow drilling
Our flow drill range can be found in the eShop.

Thread repair/threaded inserts in volume 2 section 08 Power Tools & Workshop Accessories.

HSS E	DIN 338	Type N	h8	
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Garant Jobber drill, plain shank with 3 clamping faces

Particularly sturdy and robust due to the **strengthened core diameter**. Ground flutes, with high concentricity. Precision ground point.

Recommendation: Maximum drilling depth:

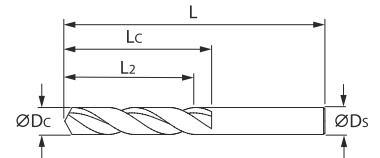
$$L_2 = L_c - 1.5 \times D_c$$

Note:

- Size 1–3,5 – Drills with plain shank, **without drive flats**
- Size 4–20 – Three **drive flats on the shank** for use in a 3-jaw chuck.
- Size 13,5–16 – Shank Ø 9.5 mm.
- Size 17–20 – Shank Ø 12.5 mm.



11 4001



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si											INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	K	N						
11 4001	70	45	40	40	30	25	10	8						12	8	25	80						

Ø D _c h8	11B 11 4001		L _c	L	
mm	Jobber drill with 3 clamping faces HSS-E		mm	mm	f < 900 N mm/rev.
1	eShop	5	12	34	0.03
1,5	eShop	5	18	40	0.03
1,6	eShop	5	20	43	0.03
2	eShop	5	24	49	0.03
2,5	eShop	5	30	57	0.03
3	eShop	10	33	61	0.03
3,2	eShop	10	36	65	0.03
3,3	eShop	10	36	65	0.03
3,5	eShop	10	39	70	0.03
4	eShop	10	43	75	0.05
4,2	eShop	10	43	75	0.05
4,5	eShop	10	47	80	0.05
5	eShop	10	52	86	0.05
5,2	eShop	10	52	86	0.05
5,5	eShop	10	57	93	0.05
6	eShop	10	57	93	0.07
6,5	eShop	10	63	101	0.07
6,8	eShop	10	69	109	0.07
7	eShop	10	69	109	0.07
7,5	eShop	10	69	109	0.07
8	eShop	5	75	117	0.1

Ø D _c h8	11B 11 4001		L _c	L	
mm	Jobber drill with 3 clamping faces HSS-E		mm	mm	f < 900 N mm/rev.
8,5	eShop	5	75	117	0.1
9	eShop	5	81	125	0.1
9,5	eShop	5	81	125	0.1
10	eShop	5	87	133	0.1
10,2	eShop	5	87	133	0.1
10,5	eShop	5	87	133	0.1
11	eShop	5	94	142	0.1
11,5	eShop	5	94	142	0.1
12	eShop	5	101	151	0.16
12,5	eShop	5	101	151	0.16
13	eShop	5	101	151	0.16
13,5	eShop	1	108	160	0.16
14	eShop	1	108	160	0.16
14,5	eShop	1	114	169	0.16
15	eShop	1	114	169	0.16
15,5	eShop	1	120	178	0.16
16	eShop	1	120	178	0.2
17	eShop	1	125	184	0.2
18	eShop	1	130	191	0.2
19	eShop	1	135	198	0.2
20	eShop	1	140	205	0.2

11

HSS E	DIN 338	Type N	h8	
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Garant Jobber drill set, plain shank with 3 clamping faces

Composed of jobber drills DIN 338.

Additionally with intermediate sizes for tapping drill holes Ø 1.6; 3.3; 4.2; 6.8; and 10.2 mm.

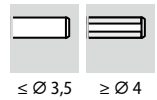
Note:

- Ø 1 – 3.5 mm: Drills with plain shank, **without drive flats**.
- Ø 4 – 10.5 mm: Drill with plain shank and 3 drive flats.

Type	1-10,5
11B 11 4010	Jobber drill set HSS-E No. 11 4001 with case
Drill range	mm 1 – 10.5
Number of drills	25
Tapping hole Ø	mm 1.6; 3.3; 4.2; 6.8; 10.2
Incremental steps of drills	mm 0.5



11 4010



Garant Jobber drill, plain shank with stepped tip

Chamfers are nitrided. Particularly sturdy and robust due to the **strengthened core diameter**. Ground flutes, with high concentricity. Precision ground point.

Three **drive flats on the shank** for use in a 3-jaw chuck.

- Ideal for producing precise holes in sheet metal, pipes, and profiles.
- Reliable spot drilling without centring or centre punching – even on curved surfaces – thanks to **innovative ground point**.
- **Oblique drilling** possible without any problems after the first level of the drill tip has penetrated the material.
- Drilling with significantly less force required than with conventional DIN338 HSS drills – up to a diameter of 13 mm directly in the cordless drill/driver.
- Stable and secure form fit in the 3-jaw chuck.
- **General use** across a wide spectrum of materials including plastic, wood and acrylic without tearing or splintering.
- The drill does not rattle or dig in – even in the case of thin-walled materials.
- Burr-free drill exit.
- Ideal for drilling out bolts and rivets.

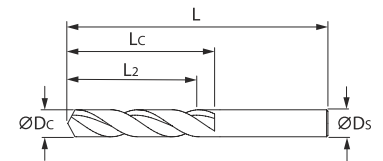
11 4008 – With special cutter geometry also for use in stainless steels.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$

Note:

- Size 1–3,5 – Drills with plain shank, **without drive flat**.
- Size 4–13 – Drill with plain shank and 3 drive flats.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 900 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 4004	70	70	50	30	27	22	10										25	50	●	●			
11 4008	70	70	50	35	32	25	15							14	12		30	50	●	●			

Ø D _c h8	11Q 11 4004	11Q 11 4008		L _c	L	f
mm	N	Stainless steel		mm	mm	mm/rev.
1	eShop	eShop	10	12	34	0.02
1,5	eShop	eShop	10	18	40	0.02
2	eShop	eShop	10	24	49	0.04
2,5	eShop	eShop	10	30	57	0.04
3	eShop	eShop	10	33	61	0.06
3,2	eShop	eShop	10	36	65	0.06
3,3	eShop	eShop	10	36	65	0.06
3,5	eShop	eShop	10	39	70	0.06
4	eShop	eShop	10	43	75	0.08
4,1	eShop	eShop	10	43	75	0.08
4,2	eShop	eShop	10	43	75	0.08
4,5	eShop	eShop	10	47	80	0.08
4,9	eShop	eShop	10	52	86	0.08
5	eShop	eShop	10	52	86	0.1
5,1	eShop	eShop	10	52	86	0.1
5,2	eShop	eShop	10	52	86	0.1
5,5	eShop	eShop	10	57	93	0.1

Ø D _c h8	11Q 11 4004	11Q 11 4008		L _c	L	f
mm	N	Stainless steel		mm	mm	mm/rev.
6	eShop	eShop	10	57	93	0.1
6,5	eShop	eShop	10	63	101	0.125
6,8	eShop	eShop	10	69	109	0.125
7	eShop	eShop	10	69	109	0.125
7,5	eShop	eShop	10	69	109	0.125
8	eShop	eShop	5	75	117	0.16
8,5	eShop	eShop	5	75	117	0.16
9	eShop	eShop	5	81	125	0.16
9,5	eShop	eShop	5	81	125	0.16
10	eShop	eShop	5	87	133	0.2
10,2	eShop	eShop	5	87	133	0.2
10,5	eShop	eShop	5	87	133	0.2
11	eShop	eShop	1	94	142	0.2
11,5	eShop	eShop	1	94	142	0.2
12	eShop	eShop	1	101	151	0.2
12,5	eShop	eShop	1	101	151	0.2
13	eShop	eShop	1	101	151	0.2

Flexible and reliable – the drilling tool for professionals who get on with the job.

Assembly, repair, maintenance and service.

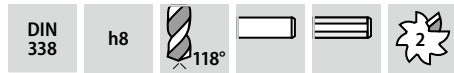
Soft-cutting stepped geometry for process-reliable spot drilling, even without centre punching.

Optionally with HSS or HSS-E substrate.



Version in DIN 338 with 3 clamping faces.



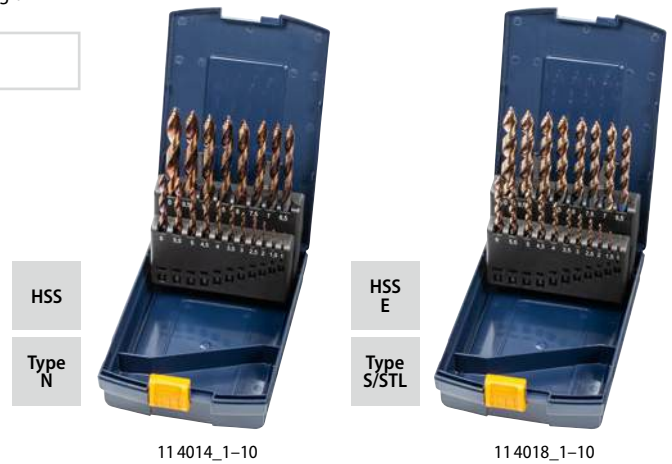


Garant Jobber drill sets, plain shank with stepped tip

Composed of jobber drills DIN 338.

11 4014/4018 Size 1-10,5; 1-13KB – **Additionally with intermediate sizes** for tapping drill holes Ø 3.3; 4.2; 6.8 and 10.2 mm.

Note: Ø 1 - 3.5 mm: Drills with plain shank, **without drive flats**.
Ø 4 - 10 mm: Drill with plain shank and 3 drive flats.

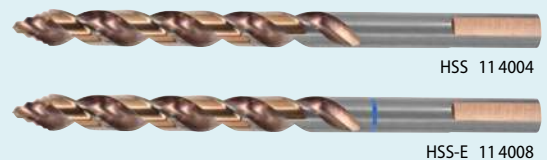


Type		1-10	1-10,5	1-13	1-13KB
11 4014	Jobber drill set HSS with stepped tip No. 114004 with case	eShop	eShop	eShop	eShop
11 4018	Jobber drill set HSS-E with stepped tip No. 114008 with case	eShop	eShop	eShop	eShop
Drill range	mm	1 – 10	1 – 10.5	1 – 13	1 – 13
Number of drills		19	24	25	29
Tapping hole Ø	mm	–	3.3; 4.2; 6.8; 10.2	–	3.3; 4.2; 6.8; 10.2
Incremental steps of drills	mm			0.5	

Application areas

General purpose steel => **HSS**

Stainless, brass => **HSS-E**

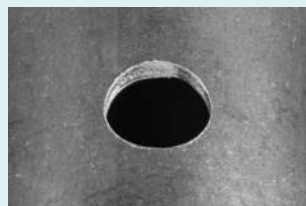


For use on general materials:

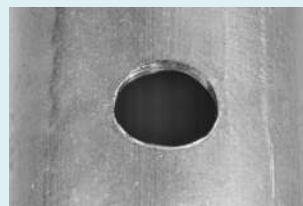
- Aluminium pipe
- Copper pipe
- Brass panel
- Acrylic glass
- PVC plastic pipe
- St37 (structural steel)
- and much more.



PVC



St37



Aluminium



Brass

Our customers' opinions:

- St37 (S235) => "No problems, holes are beautifully round and smooth."
- INOX (VA, stainless) => "Works flawlessly. Choosing the right cutting data is crucial."
- Plastic => "Clean surface without burrs."
- Copper => "So far only positive feedback from my mechanics."



MOLEX Jobber drills, plain shank

Roll forged, standard helix angle, core thickness and core taper.
Dimensions to DIN 338.

11 4000 – No interruption in the material structure, so the drill is more resilient and suitable for arduous drilling tasks (e. g. with hand held drills). Economy version.

11 4020 – Robust jobber drill with strengthened core and small chisel point for easy spot drilling and accurate centring of the designated hole.

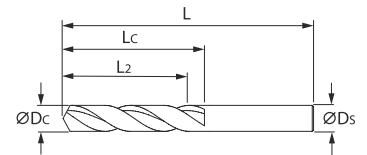
Precision roll forged flutes.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$

Note:

11 4020 – Size 14-20: Shank $\varnothing$ 13 mm with 3 drive flats.



11 4000



11 4020



*Precision roll forged (11 4020):
The profile is forged in a chipless process,
the guide chamfers are additionally ground.*

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 4000		45		40	30	25											25						
11 4020		45		40	30	25											25						

$\varnothing$ D _c h8	11 4000	11 4020		L _c	L	f	$\varnothing$ D _c h8	11 4000	11 4020		L _c	L	f
	HSS jobber drill							HSS jobber drill					
mm	roll forged N	Precision roll forged N		mm	mm	mm/rev.	mm	roll forged N	Precision roll forged N		mm	mm	mm/rev.
1	eShop	eShop	5	12	34	0.03	6,4	eShop	eShop	10	63	101	0.07
1,1	eShop	eShop	5	14	36	0.03	6,5	eShop	eShop	10	63	101	0.07
1,2	eShop	eShop	5	16	38	0.03	6,6	eShop	eShop	10	63	101	0.07
1,3	eShop	eShop	5	16	38	0.03	6,7	eShop	eShop	10	63	101	0.07
1,4	eShop	eShop	5	18	40	0.03	6,8	eShop	eShop	10	69	109	0.07
1,5	eShop	eShop	5	18	40	0.03	6,9	eShop	eShop	10	69	109	0.07
1,6	eShop	eShop	5	20	43	0.03	7	eShop	eShop	10	69	109	0.07
1,7	eShop	eShop	5	20	43	0.03	7,1	eShop	eShop	10	69	109	0.07
1,8	eShop	eShop	5	22	46	0.03	7,2	eShop	eShop	10	69	109	0.07
1,9	eShop	eShop	5	22	46	0.03	7,3	eShop	eShop	10	69	109	0.07
2	eShop	eShop	5	24	49	0.03	7,4	eShop	eShop	10	69	109	0.07
2,1	eShop	eShop	5	24	49	0.03	7,5	eShop	eShop	10	69	109	0.07
2,2	eShop	eShop	5	27	53	0.03	7,6	eShop	eShop	5	75	117	0.07
2,3	eShop	eShop	5	27	53	0.03	7,7	eShop	eShop	5	75	117	0.07
2,4	eShop	eShop	5	30	57	0.03	7,8	eShop	eShop	5	75	117	0.07
2,5	eShop	eShop	5	30	57	0.03	7,9	eShop	eShop	5	75	117	0.07
2,6	eShop	eShop	5	30	57	0.03	8	eShop	eShop	5	75	117	0.1
2,7	eShop	eShop	5	33	61	0.03	8,1	eShop	eShop	5	75	117	0.1
2,8	eShop	eShop	5	33	61	0.03	8,2	eShop	eShop	5	75	117	0.1
2,9	eShop	eShop	5	33	61	0.03	8,3	eShop	eShop	5	75	117	0.1
3	eShop	eShop	10	33	61	0.03	8,4	eShop	eShop	5	75	117	0.1
3,1	eShop	eShop	10	36	65	0.03	8,5	eShop	eShop	5	75	117	0.1
3,2	eShop	eShop	10	36	65	0.03	8,6	eShop	eShop	5	81	125	0.1
3,3	eShop	eShop	10	36	65	0.03	8,7	eShop	eShop	5	81	125	0.1
3,4	eShop	eShop	10	39	70	0.03	8,8	eShop	eShop	5	81	125	0.1
3,5	eShop	eShop	10	39	70	0.03	8,9	eShop	eShop	5	81	125	0.1
3,6	eShop	eShop	10	39	70	0.03	9	eShop	eShop	5	81	125	0.1
3,7	eShop	eShop	10	39	70	0.03	9,1	eShop	eShop	5	81	125	0.1
3,8	eShop	eShop	10	43	75	0.03	9,2	eShop	eShop	5	81	125	0.1
3,9	eShop	eShop	10	43	75	0.03	9,3	eShop	eShop	5	81	125	0.1
4	eShop	eShop	10	43	75	0.05	9,4	eShop	eShop	5	81	125	0.1
4,1	eShop	eShop	10	43	75	0.05	9,5	eShop	eShop	5	81	125	0.1
4,2	eShop	eShop	10	43	75	0.05	9,6	eShop	eShop	5	87	133	0.1
4,3	eShop	eShop	10	47	80	0.05	9,7	eShop	eShop	5	87	133	0.1
4,4	eShop	eShop	10	47	80	0.05	9,8	eShop	eShop	5	87	133	0.1
4,5	eShop	eShop	10	47	80	0.05	9,9	eShop	eShop	5	87	133	0.1
4,6	eShop	eShop	10	47	80	0.05	10	eShop	eShop	5	87	133	0.1
4,7	eShop	eShop	10	47	80	0.05	10,2	eShop	eShop	5	87	133	0.1
4,8	eShop	eShop	10	52	86	0.05	10,5	eShop	eShop	5	87	133	0.1
4,9	eShop	eShop	10	52	86	0.05	10,8	eShop	eShop	5	94	142	0.1
5	eShop	eShop	10	52	86	0.05	11	eShop	eShop	5	94	142	0.1
5,1	eShop	eShop	10	52	86	0.05	11,2	eShop	eShop	5	94	142	0.1
5,2	eShop	eShop	10	52	86	0.05	11,5	eShop	eShop	5	94	142	0.1
5,3	eShop	eShop	10	52	86	0.05	11,8	eShop	eShop	5	94	142	0.1
5,4	eShop	eShop	10	57	93	0.05	12	eShop	eShop	5	101	151	0.16
5,5	eShop	eShop	10	57	93	0.05	12,2	eShop	eShop	5	101	151	0.16
5,6	eShop	eShop	10	57	93	0.05	12,5	eShop	eShop	5	101	151	0.16
5,7	eShop	eShop	10	57	93	0.05	12,8	eShop	eShop	5	101	151	0.16
5,8	eShop	eShop	10	57	93	0.05	13	eShop	eShop	5	101	151	0.16
5,9	eShop	eShop	10	57	93	0.05	14	–	eShop	1	108	160	0.16
6	eShop	eShop	10	57	93	0.07	15	–	eShop	1	114	169	0.16
6,1	eShop	eShop	10	63	101	0.07	16	–	eShop	1	120	178	0.2
6,2	eShop	eShop	10	63	101	0.07	18	–	eShop	1	130	191	0.2
6,3	eShop	eShop	10	63	101	0.07	20	–	eShop	1	140	205	0.2



Jobber drills, plain shank

11 4031 – **HOLEX CleverDrill**: Sturdy drills for all standard applications. Improved spot drilling behaviour due to cross-ground form. Standard core thickness and core taper. Profile ground. Surface: Bronze-coloured tempered helical flutes.

11 4150 – Profile ground: Jobber drill with high pitch accuracy and concentricity as well as precision ground point. Steam tempered from Ø 2.4 mm.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$

Note:

11 4031 – **Successor product to No. 11 4030.**

Size 13.2 – 20: With stepped shank Ø 12.7 mm.

11 4150 – Size 16 – 20: Drills with shank Ø 16 mm.



≥ 3 mm



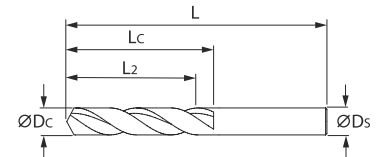
11 4031



≥ 3 mm



11 4150



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	> 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 4031	80	60	50	35	32	22	18										30	40	●	●			
11 4150	80	45	50	40	30	25	10	8									25	80	●	●			

Ø D _c h8	12B 11 4031  HOLEX CleverDrill HSS jobber drill	11B 11 4150  Garant HSS jobber drill		Inch Ø ≙	L _c	L	 < 750 N f
(mm or inch)		N		mm	mm	mm	mm/rev.
0,2	eShop	eShop	5	–	2.5	19	0.03
0,25	–	eShop	5	–	3	19	0.03
0,3	eShop	eShop	5	–	3	19	0.03
0,35	eShop	eShop	5	–	4	19	0.03
0,4	eShop	eShop	5	–	5	20	0.03
1/64	–	eShop 	–	0.4	5	20	0.03
0,45	eShop	eShop	5	–	5	20	0.03
0,5	eShop	eShop	5	–	6	22	0.03
0,55	eShop	eShop	5	–	7	24	0.03
0,6	eShop	eShop	5	–	7	24	0.03
0,65	eShop	eShop	5	–	8	26	0.03
0,7	eShop	eShop	5	–	9	28	0.03
0,75	eShop	eShop	5	–	9	28	0.03
1/32	–	eShop 	–	0.79	10	30	0.03
0,8	eShop	eShop	5	–	10	30	0.03
0,85	eShop	eShop	5	–	10	30	0.03
0,9	eShop	eShop	5	–	11	32	0.03
0,95	eShop	eShop	5	–	11	32	0.03
1	eShop	eShop	5	–	12	34	0.03
1,05	eShop	eShop	5	–	12	34	0.03
1,1	eShop	eShop	5	–	14	36	0.03
1,15	eShop	eShop	5	–	14	36	0.03
3/64	–	eShop 	–	1.19	16	38	0.03
1,2	eShop	eShop	5	–	16	38	0.03
1,25	eShop	eShop	5	–	16	38	0.03
1,3	eShop	eShop	5	–	16	38	0.03
1,35	eShop	eShop	5	–	18	40	0.03
1,4	eShop	eShop	5	–	18	40	0.03
1,45	eShop	eShop	5	–	18	40	0.03
1,5	eShop	eShop	5	–	18	40	0.03
1,55	eShop	eShop	5	–	20	43	0.03
1/16	–	eShop 	–	1.59	20	43	0.03
1,6	eShop	eShop	5	–	20	43	0.03
1,65	eShop	eShop	5	–	20	43	0.03
1,7	eShop	eShop	5	–	20	43	0.03
1,75	eShop	eShop	5	–	22	46	0.03
1,8	eShop	eShop	5	–	22	46	0.03
1,85	eShop	eShop	5	–	22	46	0.03
1,9	eShop	eShop	5	–	22	46	0.03
1,95	eShop	eShop	5	–	24	49	0.03
5/64	–	eShop 	–	1.98	24	49	0.03

Ø D _c h8	12B 11 4031 HOLEX HOLEX CleverDrill HSS jobber drill	11B 11 4150 Garant HSS jobber drill	 Inch Ø ≙	L _c	L	 f f	
(mm or inch)	N		mm	mm	mm	mm/rev.	
2	eShop	eShop	5	—	24	49	0.03
2,05	eShop	eShop	5	—	24	49	0.03
2,1	eShop	eShop	5	—	24	49	0.03
2,15	eShop	eShop	5	—	27	53	0.03
2,2	eShop	eShop	5	—	27	53	0.03
2,3	eShop	eShop	5	—	27	53	0.03
3/32	—	eShop 	—	2.38	30	57	0.03
2,4	eShop	eShop	5	—	30	57	0.03
2,5	eShop	eShop 	5	—	30	57	0.03
2,6	eShop	eShop	5	—	30	57	0.03
2,7	eShop	eShop	5	—	33	61	0.03
7/64	—	eShop 	—	2.78	33	61	0.03
2,8	eShop	eShop	5	—	33	61	0.03
2,9	eShop	eShop	5	—	33	61	0.03
3	eShop	eShop	10	—	33	61	0.03
3,1	eShop	eShop	10	—	36	65	0.03
1/8	—	eShop 	—	3.17	36	65	0.03
3,2	eShop	eShop	10	—	36	65	0.03
3,25	eShop	eShop	10	—	36	65	0.03
3,3	eShop	eShop	10	—	36	65	0.03
3,4	eShop	eShop	10	—	39	70	0.03
3,5	eShop	eShop 	10	—	39	70	0.03
9/64	—	eShop 	—	3.57	39	70	0.03
3,6	eShop	eShop	10	—	39	70	0.03
3,7	eShop	eShop	10	—	39	70	0.03
3,8	eShop	eShop	10	—	43	75	0.03
3,9	eShop	eShop	10	—	43	75	0.03
5/32	—	eShop 	—	3.97	43	75	0.03
4	eShop	eShop 	10	—	43	75	0.05
4,1	eShop	eShop	10	—	43	75	0.05
4,2	eShop	eShop	10	—	43	75	0.05
4,3	eShop	eShop	10	—	47	80	0.05
11/64	—	eShop 	—	4.37	47	80	0.05
4,4	eShop	eShop	10	—	47	80	0.05
4,5	eShop	eShop	10	—	47	80	0.05
4,6	eShop	eShop	10	—	47	80	0.05
4,65	eShop	eShop	10	—	47	80	0.05
4,7	eShop	eShop	10	—	47	80	0.05
3/16	—	eShop 	—	4.76	52	86	0.05
4,8	eShop	eShop	10	—	52	86	0.05
4,9	eShop	eShop	10	—	52	86	0.05



11

Ø D _c h8	12B 11 4031 HOLEX CleverDrill HSS jobber drill	11B 11 4150 Garant HSS jobber drill		Inch Ø	L _c	L	 f
(mm or inch)	N			mm	mm	mm	mm/rev.
5	eShop	eShop	10	—	52	86	0.05
5,1	eShop	eShop	10	—	52	86	0.05
13/64	—	eShop	—	5.16	52	86	0.05
5,2	eShop	eShop	10	—	52	86	0.05
5,3	eShop	eShop	10	—	52	86	0.05
5,4	eShop	eShop	10	—	57	93	0.05
5,5	eShop	eShop	10	—	57	93	0.05
5,55	eShop	eShop	10	—	57	93	0.05
7/32	—	eShop	—	5.56	57	93	0.05
5,6	eShop	eShop	10	—	57	93	0.05
5,65	—	eShop	10	—	57	93	0.05
5,7	eShop	eShop	10	—	57	93	0.05
5,8	eShop	eShop	10	—	57	93	0.05
5,9	eShop	eShop	10	—	57	93	0.05
15/64	—	eShop	—	5.95	57	93	0.07
6	eShop	eShop	10	—	57	93	0.07
6,1	eShop	eShop	10	—	63	101	0.07
6,2	eShop	eShop	10	—	63	101	0.07
6,3	eShop	eShop	10	—	63	101	0.07
1/4	—	eShop	—	6.35	63	101	0.07
6,4	eShop	eShop	10	—	63	101	0.07
6,5	eShop	eShop	10	—	63	101	0.07
6,6	eShop	eShop	10	—	63	101	0.07
6,7	eShop	eShop	10	—	63	101	0.07
6,75	—	eShop	10	—	69	109	0.07
17/64	—	eShop	—	6.75	69	109	0.07
6,8	eShop	eShop	10	—	69	109	0.07
6,9	eShop	eShop	10	—	69	109	0.07
7	eShop	eShop	10	—	69	109	0.07
7,1	eShop	eShop	10	—	69	109	0.07
9/32	—	eShop	—	7.14	69	109	0.07
7,2	eShop	eShop	10	—	69	109	0.07
7,3	eShop	eShop	10	—	69	109	0.07
7,4	eShop	eShop	10	—	69	109	0.07
7,45	eShop	eShop	10	—	69	109	0.07
7,5	eShop	eShop	10	—	69	109	0.07
19/64	—	eShop	—	7.54	75	117	0.07
7,55	—	eShop	10	—	75	117	0.07
7,6	eShop	eShop	5	—	75	117	0.07
7,7	eShop	eShop	5	—	75	117	0.07
7,8	eShop	eShop	5	—	75	117	0.07
7,9	eShop	eShop	5	—	75	117	0.07
5/16	—	eShop	—	7.94	75	117	0.07
8	eShop	eShop	5	—	75	117	0.1
8,1	eShop	eShop	5	—	75	117	0.1
8,2	eShop	eShop	5	—	75	117	0.1
8,3	eShop	eShop	5	—	75	117	0.1
21/64	—	eShop	—	8.33	75	117	0.1
8,4	eShop	eShop	5	—	75	117	0.1
8,5	eShop	eShop	5	—	75	117	0.1
8,6	eShop	eShop	5	—	81	125	0.1
8,7	eShop	eShop	5	—	81	125	0.1
11/32	—	eShop	—	8.73	81	125	0.1
8,8	eShop	eShop	5	—	81	125	0.1
8,9	eShop	eShop	5	—	81	125	0.1
9	eShop	eShop	5	—	81	125	0.1
9,1	eShop	eShop	5	—	81	125	0.1
23/64	—	eShop	—	9.13	81	125	0.1
9,2	eShop	eShop	5	—	81	125	0.1
9,25	eShop	eShop	5	—	81	125	0.1
9,3	eShop	eShop	5	—	81	125	0.1
9,4	eShop	eShop	5	—	81	125	0.1
9,5	eShop	eShop	5	—	81	125	0.1
3/8	—	eShop	—	9.52	87	133	0.1
9,55	—	eShop	5	—	87	133	0.1
9,6	eShop	eShop	5	—	87	133	0.1
9,7	eShop	eShop	5	—	87	133	0.1
9,8	eShop	eShop	5	—	87	133	0.1
9,9	eShop	eShop	5	—	87	133	0.1
25/64	—	eShop	—	9.92	87	133	0.1
10	eShop	eShop	5	—	87	133	0.1
10,1	eShop	eShop	5	—	87	133	0.1
10,2	eShop	eShop	5	—	87	133	0.1

Ø D _c h8	12B 11 4031 HOLEX CleverDrill HSS jobber drill	11B 11 4150 Garant HSS jobber drill		Inch Ø	L _c	L	 f
(mm or inch)	N			mm	mm	mm	mm/rev.
10,25	—	eShop	5	—	87	133	0.1
10,3	eShop	eShop	5	—	87	133	0.1
13/32	—	eShop	—	10.32	87	133	0.1
10,4	eShop	eShop	5	—	87	133	0.1
10,5	eShop	eShop	5	—	87	133	0.1
10,6	eShop	eShop	5	—	87	133	0.1
10,7	eShop	eShop	5	—	94	142	0.1
27/64	—	eShop	—	10.72	94	142	0.1
10,8	eShop	eShop	5	—	94	142	0.1
10,9	eShop	eShop	5	—	94	142	0.1
11	eShop	eShop	5	—	94	142	0.1
11,1	eShop	eShop	5	—	94	142	0.1
7/16	—	eShop	—	11.11	94	142	0.1
11,2	eShop	eShop	5	—	94	142	0.1
11,3	eShop	eShop	5	—	94	142	0.1
11,35	—	eShop	5	—	94	142	0.1
11,4	eShop	eShop	5	—	94	142	0.1
11,5	eShop	eShop	5	—	94	142	0.1
29/64	—	eShop	—	11.51	94	142	0.1
11,55	—	eShop	5	—	94	142	0.1
11,6	eShop	eShop	5	—	94	142	0.1
11,7	eShop	eShop	5	—	94	142	0.1
11,8	eShop	eShop	5	—	94	142	0.1
11,9	eShop	eShop	5	—	101	151	0.1
15/32	—	eShop	—	11.91	101	151	0.1
12	eShop	eShop	5	—	101	151	0.16
12,2	eShop	eShop	5	—	101	151	0.16
31/64	—	eShop	—	12.3	101	151	0.16
12,5	eShop	eShop	5	—	101	151	0.16
1/2	—	eShop	—	12.7	101	151	0.16
12,8	eShop	eShop	5	—	101	151	0.16
12,9	eShop	eShop	5	—	101	151	0.16
13	eShop	eShop	5	—	101	151	0.16
33/64	—	eShop	—	13.1	101	151	0.16
13,2	eShop	eShop	1	—	101	151	0.16
17/32	—	eShop	—	13.49	108	160	0.16
13,5	eShop	eShop	1	—	108	160	0.16
13,8	eShop	eShop	1	—	108	160	0.16
35/64	—	eShop	—	13.89	108	160	0.16
14	eShop	eShop	1	—	108	160	0.16
9/16	eShop	eShop	1	14.29	114	169	0.16
14,5	eShop	eShop	1	—	114	169	0.16
37/64	—	eShop	—	14.68	114	169	0.16
14,75	eShop	eShop	1	—	114	169	0.16
15	eShop	eShop	1	—	114	169	0.16
19/32	—	eShop	—	15.08	120	178	0.16
15,1	—	eShop	1	—	120	178	0.16
15,25	eShop	eShop	1	—	120	178	0.16
39/64	—	eShop	—	15.48	120	178	0.16
15,35	—	eShop	1	—	120	178	0.16
15,5	eShop	eShop	1	—	120	178	0.16
15,75	eShop	eShop	1	—	120	178	0.16
5/8	—	eShop	—	15.87	120	178	0.16
16	eShop	eShop	1	—	120	178	0.2
41/64	—	eShop	—	16.27	125	184	0.2
16,5	eShop	eShop	1	—	125	184	0.2
21/32	—	eShop	—	16.67	125	184	0.2
17	eShop	eShop	1	—	125	184	0.2
43/64	—	eShop	—	17.07	130	191	0.2
17,35	—	eShop	1	—	130	191	0.2
11/16	—	eShop	—	17.46	130	191	0.2
17,5	eShop	eShop	1	—	130	191	0.2
45/64	—	eShop	—	17.86	130	191	0.2
18	eShop	eShop	1	—	130	191	0.2
23/32	—	eShop	—	18.26	135	198	0.2
18,5	eShop	eShop	1	—	135	198	0.2
47/64	—	eShop	—	18.65	135	198	0.2
19	eShop	eShop	1	—	135	198	0.2
3/4	—	eShop	—	19.05	140	205	0.2
19,35	—	eShop	1	—	140	205	0.2
19,5	eShop	eShop	1	—	140	205	0.2
25/32	—	eShop	—	19.84	140	205	0.2
20	eShop	eShop	1	—	140	205	0.2



Jobber drills, plain shank

Standard core without core taper.
Precision ground point.

11 4200 – Ground flute with high helix.
Bright ground surface finish.

11 4360 – **Profile ground:**
High concentricity and pitch accuracy, drills for series production use.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



≥ 2 mm



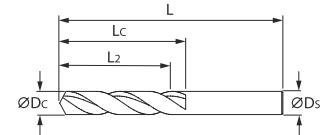
11 4200



11 4360



≥ 2.4 mm



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 4200	70	45	40																				
11 4360		56	50	50	37	31	12	10						15	10	6	31	80					

Ø D _c h8	11B 11 4200		12B 11 4360			L _c	L	 f	 f	Ø D _c h8	11B 11 4200		12B 11 4360			L _c	L	 f	 f		
	Garant		HOLEX								Garant		HOLEX								
	HSS jobber drill										HSS jobber drill										
	W	N	W	N							W	N									
mm		TiN		TiN	mm	mm	mm/rev.	mm/rev.	mm	mm	mm/rev.	mm/rev.	mm	mm	mm/rev.	mm/rev.	mm	mm	mm/rev.	mm/rev.	
0,9	eShop	—	5	11	32	0.05	—			6,4	eShop	eShop	10	63	101	0.14	0.13				
1	eShop	eShop	5	12	34	0.05	0.05			6,5	eShop	eShop	10	63	101	0.14	0.13				
1,1	eShop	eShop	5	14	36	0.05	0.05			6,6	eShop	eShop	10	63	101	0.14	0.13				
1,2	eShop	eShop	5	16	38	0.05	0.05			6,7	eShop	eShop	10	63	101	0.14	0.13				
1,3	eShop	eShop	5	16	38	0.05	0.05			6,8	eShop	eShop	10	69	109	0.14	0.13				
1,4	eShop	eShop	5	16	38	0.05	0.05			6,9	eShop	eShop	10	69	109	0.14	0.13				
1,5	eShop	eShop	5	18	40	0.05	0.05			7	eShop	eShop	10	69	109	0.14	0.13				
1,6	eShop	eShop	5	20	43	0.05	0.05			7,1	eShop	eShop	10	69	109	0.14	0.13				
1,7	eShop	eShop	5	20	43	0.05	0.05			7,2	eShop	eShop	10	69	109	0.14	0.13				
1,8	eShop	eShop	5	22	46	0.05	0.05			7,3	eShop	eShop	10	69	109	0.14	0.13				
1,9	eShop	eShop	5	22	46	0.05	0.05			7,4	eShop	eShop	10	69	109	0.14	0.13				
2	eShop	eShop	5	24	49	0.05	0.05			7,5	eShop	eShop	10	69	109	0.14	0.13				
2,1	eShop	eShop	5	24	49	0.05	0.05			7,6	eShop	eShop	5	75	117	0.14	0.13				
2,2	eShop	eShop	5	27	57	0.05	0.05			7,7	eShop	eShop	5	75	117	0.14	0.13				
2,3	eShop	eShop	5	27	57	0.05	0.05			7,8	eShop	eShop	5	75	117	0.14	0.13				
2,4	eShop	eShop	5	30	57	0.05	0.05			7,9	eShop	eShop	5	75	117	0.14	0.13				
2,5	eShop	eShop	5	30	57	0.05	0.05			8	eShop	eShop	5	75	117	0.18	0.16				
2,6	eShop	eShop	5	30	57	0.05	0.05			8,1	eShop	eShop	5	75	117	0.18	0.16				
2,7	eShop	eShop	5	33	61	0.05	0.05			8,2	eShop	eShop	5	75	117	0.18	0.16				
2,8	eShop	eShop	5	33	61	0.05	0.05			8,3	eShop	eShop	5	75	117	0.18	0.16				
2,9	eShop	eShop	5	33	61	0.05	0.05			8,4	eShop	eShop	5	75	117	0.18	0.16				
3	eShop	eShop	10	33	61	0.05	0.05			8,5	eShop	eShop	5	75	117	0.18	0.16				
3,1	eShop	eShop	10	36	65	0.05	0.05			8,6	eShop	eShop	5	81	125	0.18	0.16				
3,2	eShop	eShop	10	36	65	0.05	0.05			8,7	eShop	eShop	5	81	125	0.18	0.16				
3,3	eShop	eShop	10	36	65	0.05	0.05			8,8	eShop	eShop	5	81	125	0.18	0.16				
3,4	eShop	eShop	10	39	70	0.05	0.05			8,9	eShop	eShop	5	81	125	0.18	0.16				
3,5	eShop	eShop	10	39	70	0.05	0.05			9	eShop	eShop	5	81	125	0.18	0.16				
3,6	eShop	eShop	10	39	70	0.05	0.05			9,1	eShop	eShop	5	81	125	0.18	0.16				
3,7	eShop	eShop	10	39	70	0.05	0.05			9,2	eShop	eShop	5	81	125	0.18	0.16				
3,8	eShop	eShop	10	43	75	0.05	0.05			9,3	eShop	eShop	5	81	125	0.18	0.16				
3,9	eShop	eShop	10	43	75	0.05	0.05			9,4	eShop	eShop	5	81	125	0.18	0.16				
4	eShop	eShop	10	43	75	0.05	0.09			9,5	eShop	eShop	5	81	125	0.18	0.16				
4,1	eShop	eShop	10	43	75	0.05	0.09			9,6	eShop	eShop	5	87	133	0.18	0.16				
4,2	eShop	eShop	10	43	75	0.05	0.09			9,7	eShop	eShop	5	87	133	0.18	0.16				
4,3	eShop	eShop	10	47	80	0.05	0.09			9,8	eShop	eShop	5	87	133	0.18	0.16				
4,4	eShop	eShop	10	47	80	0.05	0.09			9,9	eShop	eShop	5	87	133	0.18	0.16				
4,5	eShop	eShop	10	47	80	0.05	0.09			10	eShop	eShop	5	87	133	0.18	0.16				
4,6	eShop	eShop	10	47	80	0.05	0.09			10,1	—	eShop	5	87	133	—	0.16				
4,7	eShop	eShop	10	47	80	0.05	0.09			10,2	eShop	eShop	5	87	133	0.18	0.16				
4,8	eShop	eShop	10	52	86	0.05	0.09			10,5	eShop	eShop	5	87	133	0.18	0.16				
4,9	eShop	eShop	10	52	86	0.05	0.09			10,8	—	eShop	5	94	142	—	0.16				
5	eShop	eShop	10	52	86	0.14	0.09			11	eShop	eShop	5	94	142	0.18	0.16				
5,1	eShop	eShop	10	52	86	0.14	0.09			11,2	—	eShop	5	94	142	—	0.16				
5,2	eShop	eShop	10	52	86	0.14	0.09			11,5	eShop	eShop	5	94	142	0.18	0.16				
5,3	eShop	eShop	10	52	86	0.14	0.09			11,8	—	eShop	5	94	142	—	0.16				
5,4	eShop	eShop	10	57	93	0.14	0.09			12	eShop	eShop	5	101	151	0.22	0.2				
5,5	eShop	eShop	10	57	93	0.14	0.09			12,2	—	eShop	5	101	151	—	0.2				
5,6	eShop	eShop	10	57	93	0.14	0.09			12,5	eShop	eShop	5	101	151	0.22	0.2				
5,7	eShop	eShop	10	57	93	0.14	0.09			12,8	—	eShop	5	101	151	—	0.2				
5,8	eShop	eShop	10	57	93	0.14	0.09			13	eShop	eShop	5	101	151	0.22	0.2				
5,9	eShop	eShop	10	57	93	0.14	0.09			14	—	eShop	1	108	160	—	0.2				
6	eShop	eShop	10	57	93	0.14	0.13			14,5	—	eShop	1	114	169	—	0.2				
6,1	eShop	eShop	10	63	101	0.14	0.13			15	—	eShop	1	114	169	—	0.2				
6,2	eShop	eShop	10	63	101	0.14	0.13			15,5	—	eShop	1	120	178	—	0.2				
6,3	eShop	eShop	10	63	101	0.14	0.13			16	—	eShop	1	120	178	—	0.25				



11



Jobber drills, plain shank

Profile ground: this ensures high concentricity and pitch accuracy.
Precision ground point. Drill for production use.

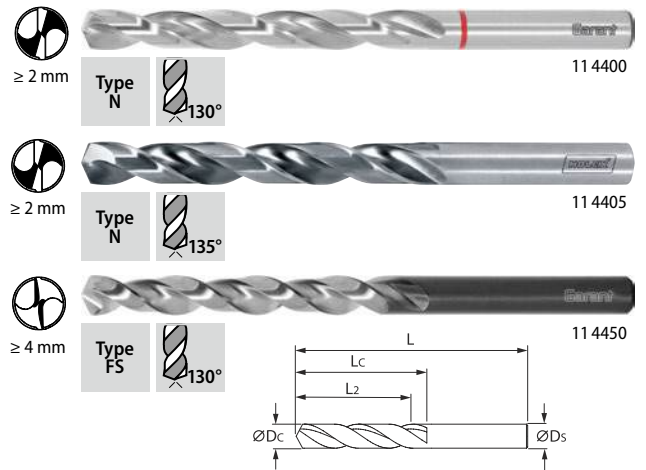
11 4400 – **Reinforced core**, bright finish.

11 4450 – **Strengthened core**.

Bright finish **parabolic flutes**, from 3 mm nitrided chamfers.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	TOOLOX [®] 33 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
11 4400				40	30	25	10	8				8	12	8	5	25	80	●	●	●	●	●	●
11 4405				35	28	22	8	6					8					●	●	●	●	●	●
11 4450	70	45		40	30	25										25		●	●	●	●	●	●

Ø D _c h8	11B	11 4400	12B	11 4405	11B	11 4450		L _c	L	 < 750 N f	Ø D _c h8	11B	11 4400	12B	11 4405	11B	11 4450		L _c	L	 < 750 N f			
		Garant		HOLEX		Garant							Garant		HOLEX		Garant							
				Jobber drill HSS-E									Jobber drill HSS-E				Jobber drill HSS-E							
mm		N		N		FS		mm	mm	mm/rev.		mm		N		N		FS		mm	mm	mm/rev.		
1		eShop		eShop		eShop		5	12	34	0.03		6,6		eShop		eShop		eShop		10	63	101	0.07
1,1		eShop		eShop		eShop		5	14	36	0.03		6,7		eShop		eShop		eShop		10	63	101	0.07
1,2		eShop		eShop		eShop		5	16	38	0.03		6,8		eShop		eShop		eShop		10	69	109	0.07
1,3		eShop		eShop		eShop		5	16	38	0.03		6,9		eShop		eShop		eShop		10	69	109	0.07
1,4		eShop		eShop		eShop		5	18	40	0.03		7		eShop		eShop		eShop		10	69	109	0.07
1,5		eShop		eShop		eShop		5	18	40	0.03		7,1		eShop		eShop		eShop		10	69	109	0.07
1,6		eShop		eShop		eShop		5	20	43	0.03		7,2		eShop		eShop		eShop		10	69	109	0.07
1,7		eShop		eShop		eShop		5	20	43	0.03		7,3		eShop		eShop		eShop		10	69	109	0.07
1,8		eShop		eShop		eShop		5	22	46	0.03		7,4		eShop		eShop		eShop		10	69	109	0.07
1,9		eShop		eShop		eShop		5	22	46	0.03		7,5		eShop		eShop		eShop		10	69	109	0.07
2		eShop		eShop		eShop		5	24	49	0.03		7,6		eShop		eShop		eShop		5	75	117	0.07
2,1		eShop		eShop		eShop		5	24	49	0.03		7,7		eShop		eShop		eShop		5	75	117	0.07
2,2		eShop		eShop		eShop		5	27	53	0.03		7,8		eShop		eShop		eShop		5	75	117	0.07
2,3		eShop		eShop		eShop		5	27	53	0.03		7,9		eShop		eShop		eShop		5	75	117	0.07
2,4		eShop		eShop		eShop		5	30	57	0.03		8		eShop		eShop		eShop		5	75	117	0.1
2,5		eShop		eShop		eShop		5	30	57	0.03		8,1		eShop		eShop		eShop		5	75	117	0.1
2,6		eShop		eShop		eShop		5	30	57	0.03		8,2		eShop		eShop		eShop		5	75	117	0.1
2,7		eShop		eShop		eShop		5	33	61	0.03		8,3		eShop		eShop		eShop		5	75	117	0.1
2,8		eShop		eShop		eShop		5	33	61	0.03		8,4		eShop		eShop		eShop		5	75	117	0.1
2,9		eShop		eShop		eShop		5	33	61	0.03		8,5		eShop		eShop		eShop		5	75	117	0.1
3		eShop		eShop		eShop		10	33	61	0.03		8,6		eShop		eShop		eShop		5	81	125	0.1
3,1		eShop		eShop		eShop		10	36	65	0.03		8,7		eShop		eShop		eShop		5	81	125	0.1
3,2		eShop		eShop		eShop		10	36	65	0.03		8,8		eShop		eShop		eShop		5	81	125	0.1
3,3		eShop		eShop		eShop		10	36	65	0.03		8,9		eShop		eShop		eShop		5	81	125	0.1
3,4		eShop		eShop		eShop		10	39	70	0.03		9		eShop		eShop		eShop		5	81	125	0.1
3,5		eShop		eShop		eShop		10	39	70	0.03		9,1		eShop		eShop		eShop		5	81	125	0.1
3,6		eShop		eShop		eShop		10	39	70	0.03		9,2		eShop		eShop		eShop		5	81	125	0.1
3,7		eShop		eShop		eShop		10	39	70	0.03		9,3		eShop		eShop		eShop		5	81	125	0.1
3,8		eShop		eShop		eShop		10	43	75	0.03		9,4		eShop		eShop		eShop		5	81	125	0.1
3,9		eShop		eShop		eShop		10	43	75	0.03		9,5		eShop		eShop		eShop		5	81	125	0.1
4		eShop		eShop		eShop		10	43	75	0.05		9,6		eShop		eShop		eShop		5	87	133	0.1
4,1		eShop		eShop		eShop		10	43	75	0.05		9,7		eShop		eShop		eShop		5	87	133	0.1
4,2		eShop		eShop		eShop		10	43	75	0.05		9,8		eShop		eShop		eShop		5	87	133	0.1
4,3		eShop		eShop		eShop		10	47	80	0.05		9,9		eShop		eShop		eShop		5	87	133	0.1
4,4		eShop		eShop		eShop		10	47	80	0.05		10		eShop		eShop		eShop		5	87	133	0.1
4,5		eShop		eShop		eShop		10	47	80	0.05		10,1		eShop		eShop		eShop		5	87	133	0.1
4,6		eShop		eShop		eShop		10	47	80	0.05		10,2		eShop		eShop		eShop		5	87	133	0.1
4,7		eShop		eShop		eShop		10	47	80	0.05		10,3		eShop		—		—		5	87	133	0.1
4,8		eShop		eShop		eShop		10	52	86	0.05		10,5		eShop		eShop		eShop		5	87	133	0.1
4,9		eShop		eShop		eShop		10	52	86	0.05		10,8		eShop		eShop		eShop		5	94	142	0.1
5		eShop		eShop		eShop		10	52	86	0.05		11		eShop		eShop		eShop		5	94	142	0.1
5,1		eShop		eShop		eShop		10	52	86	0.05		11,2		eShop		eShop		eShop		5	94	142	0.1
5,2		eShop		eShop		eShop		10	52	86	0.05		11,5		eShop		eShop		eShop		5	94	142	0.1
5,3		eShop		eShop		eShop		10	52	86	0.05		11,8		eShop		eShop		eShop		5	94	142	0.1
5,4		eShop		eShop		eShop		10	57	93	0.05		12		eShop		eShop		eShop		5	101	151	0.16
5,5		eShop		eShop		eShop		10	57	93	0.05		12,1		eShop		—		—		5	101	151	0.16
5,6		eShop		eShop		eShop		10	57	93	0.05		12,2		eShop		eShop		eShop		5	101	151	0.16
5,7		eShop		eShop		eShop		10	57	93	0.05		12,5		eShop		eShop		eShop		5	101	151	0.16
5,8		eShop		eShop		eShop		10	57	93	0.05		12,8		eShop		eShop		eShop		5	101	151	0.16
5,9		eShop		eShop		eShop		10	57	93	0.05		13		eShop		eShop		eShop		5	101	151	0.16
6		eShop		eShop		eShop		10	57	93	0.07		13,5		eShop		—		—		1	108	160	0.16
6,1		eShop		eShop		eShop		10	63	101	0.07		14		eShop		—		—		1	108	160	0.16
6,2		eShop		eShop		eShop		10	63	101	0.07		14,1		eShop		—		—		1	114	169	0.16
6,3		eShop		eShop		eShop		10	63	101	0.07		14,5		eShop		—		—		1	114	169	0.16
6,4		eShop		eShop		eShop		10	63	101	0.07		15		eShop		—		—		1	114	169	0.16
6,5		eShop		eShop		eShop		10	63	101	0.07		16		eShop		—		—		1	120	178	0.16

DIN
338

h8



35°



Garant

Jobber drill with plain shank, for stainless steels

11 4500 – Strengthened core taper.

11 4550 – Extremely high heat resistance,
very robust due to strong core.

11 4580 – High performance drills for outstanding performance.
Precision holes due to optimised diamond point geometry
and 4-face grinding.
The special flute profile yields a significant reduction in
cutting forces.

Recommendation: Maximum drilling depth:

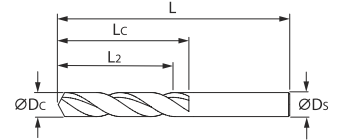
$$L_2 = L_c - 1.5 \times D_c$$

HSS
E

11 4500

HSS
Co8

11 4550



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
11 4500					37	31								15	12	6							
11 4550					37	31	12	10						20	15	6							

Ø D _c h8	11 4500	11 4550		L _c	L	INOX > 900 N f
mm	TiAIN Jobber drill HSS-E	TiAIN Jobber drill HSS-Co8		mm	mm	mm/rev.
1	eShop	eShop	5	12	34	0.02
1,1	eShop	eShop	5	14	36	0.02
1,2	eShop	eShop	5	16	38	0.02
1,3	eShop	eShop	5	16	38	0.02
1,4	eShop	eShop	5	18	40	0.02
1,5	eShop	eShop	5	18	40	0.02
1,6	eShop	eShop	5	20	43	0.02
1,7	eShop	eShop	5	20	43	0.02
1,8	eShop	eShop	5	22	46	0.02
1,9	eShop	eShop	5	22	46	0.02
2	eShop	eShop	5	24	49	0.02
2,1	eShop	eShop	5	24	49	0.02
2,2	eShop	eShop	5	27	53	0.02
2,3	eShop	eShop	5	27	53	0.02
2,4	eShop	eShop	5	30	57	0.02
2,5	eShop	eShop	5	30	57	0.02
2,6	eShop	eShop	5	30	57	0.02
2,7	eShop	eShop	5	33	61	0.02
2,8	eShop	eShop	5	33	61	0.02
2,9	eShop	eShop	5	33	61	0.02
3	eShop	eShop	10	33	61	0.02
3,1	eShop	eShop	10	36	65	0.02
3,2	eShop	eShop	10	36	65	0.02
3,3	eShop	eShop	10	36	65	0.02
3,4	eShop	eShop	10	39	70	0.02
3,5	eShop	eShop	10	39	70	0.02
3,6	eShop	eShop	10	39	70	0.02
3,7	eShop	eShop	10	39	70	0.02
3,8	eShop	eShop	10	43	75	0.02
3,9	eShop	eShop	10	43	75	0.02
4	eShop	eShop	10	43	75	0.03
4,1	eShop	eShop	10	43	75	0.03
4,2	eShop	eShop	10	43	75	0.03
4,3	eShop	eShop	10	47	80	0.03
4,4	eShop	eShop	10	47	80	0.03
4,5	eShop	eShop	10	47	80	0.03
4,6	eShop	eShop	10	47	80	0.03
4,7	eShop	eShop	10	47	80	0.03
4,8	eShop	eShop	10	52	86	0.03
4,9	eShop	eShop	10	52	86	0.03
5	eShop	eShop	10	52	86	0.04
5,1	eShop	eShop	10	52	86	0.04
5,2	eShop	eShop	10	52	86	0.04
5,3	eShop	eShop	10	52	86	0.04
5,4	eShop	eShop	10	57	93	0.04
5,5	eShop	eShop	10	57	93	0.04
5,6	eShop	eShop	10	57	93	0.04
5,7	eShop	eShop	10	57	93	0.04
5,8	eShop	eShop	10	57	93	0.04
5,9	eShop	eShop	10	57	93	0.04
6	eShop	eShop	10	57	93	0.05
6,1	eShop	eShop	10	63	101	0.05
6,2	eShop	eShop	10	63	101	0.05

Ø D _c h8	11 4500	11 4550		L _c	L	INOX > 900 N f
mm	TiAIN Jobber drill HSS-E	TiAIN Jobber drill HSS-Co8		mm	mm	mm/rev.
6,3	eShop	eShop	10	63	101	0.05
6,4	eShop	eShop	10	63	101	0.05
6,5	eShop	eShop	10	63	101	0.05
6,6	eShop	eShop	10	63	101	0.05
6,7	eShop	eShop	10	63	101	0.05
6,8	eShop	eShop	10	69	109	0.05
6,9	eShop	eShop	10	69	109	0.05
7	eShop	eShop	10	69	109	0.05
7,1	eShop	eShop	10	69	109	0.05
7,2	eShop	eShop	10	69	109	0.05
7,3	eShop	eShop	10	69	109	0.05
7,4	eShop	eShop	10	69	109	0.05
7,5	eShop	eShop	10	69	109	0.05
7,6	eShop	eShop	5	75	117	0.05
7,7	eShop	eShop	5	75	117	0.05
7,8	eShop	eShop	5	75	117	0.05
7,9	eShop	eShop	5	75	117	0.05
8	eShop	eShop	5	75	117	0.09
8,1	eShop	eShop	5	75	117	0.09
8,2	eShop	eShop	5	75	117	0.09
8,3	eShop	eShop	5	75	117	0.09
8,4	eShop	eShop	5	75	117	0.09
8,5	eShop	eShop	5	75	117	0.09
8,6	eShop	eShop	5	81	125	0.09
8,7	eShop	eShop	5	81	125	0.09
8,8	eShop	eShop	5	81	125	0.09
8,9	eShop	eShop	5	81	125	0.09
9	eShop	eShop	5	81	125	0.09
9,1	eShop	eShop	5	81	125	0.09
9,2	eShop	eShop	5	81	125	0.09
9,3	eShop	eShop	5	81	125	0.09
9,4	eShop	eShop	5	81	125	0.09
9,5	eShop	eShop	5	81	125	0.09
9,6	eShop	eShop	5	87	133	0.09
9,7	eShop	eShop	5	87	133	0.09
9,8	eShop	eShop	5	87	133	0.09
9,9	eShop	eShop	5	87	133	0.09
10	eShop	eShop	5	87	133	0.09
10,1	eShop	eShop	5	87	133	0.09
10,2	eShop	eShop	5	87	133	0.09
10,3	–	eShop	5	87	133	0.09
10,5	eShop	eShop	5	87	133	0.09
10,8	eShop	eShop	5	94	142	0.09
11	eShop	eShop	5	94	142	0.09
11,2	eShop	eShop	5	94	142	0.09
11,5	eShop	eShop	5	94	142	0.09
11,8	eShop	eShop	5	94	142	0.09
12	eShop	eShop	5	101	151	0.13
12,2	eShop	eShop	5	101	151	0.13
12,5	eShop	eShop	5	101	151	0.13
12,8	eShop	–	5	101	151	0.13
13	eShop	eShop	5	101	151	0.13



11



Garant Jobber drills, plain shank

High performance drills for outstanding performance.

Precision holes due to optimised diamond point geometry and 4-face grinding.

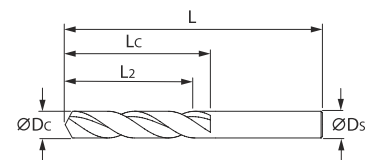
The special flute profile yields a significant reduction in cutting forces.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



11 4580



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
11 4580	75	65	60	50	40	35	16	16					17	13	8	40	50						

Ø D _c h8	11 4580		L _c	L	INOX > 900 N f
mm	TiAlN		mm	mm	mm/rev.
1	eShop	5	12	34	0.02
1,1	eShop	5	14	36	0.02
1,2	eShop	5	16	38	0.02
1,3	eShop	5	16	38	0.02
1,4	eShop	5	18	40	0.02
1,5	eShop	5	18	40	0.02
1,6	eShop	5	20	43	0.02
1,7	eShop	5	20	43	0.02
1,8	eShop	5	22	46	0.02
1,9	eShop	5	22	46	0.02
2	eShop	5	24	49	0.02
2,1	eShop	5	24	49	0.02
2,2	eShop	5	27	53	0.02
2,3	eShop	5	27	53	0.02
2,4	eShop	5	30	57	0.02
2,5	eShop	5	30	57	0.02
2,6	eShop	5	30	57	0.02
2,7	eShop	5	33	61	0.02
2,8	eShop	5	33	61	0.02
2,9	eShop	5	33	61	0.02
3	eShop	10	33	61	0.02
3,1	eShop	10	36	65	0.02
3,2	eShop	10	36	65	0.02
3,3	eShop	10	36	65	0.02
3,4	eShop	10	39	70	0.02
3,5	eShop	10	39	70	0.02
3,6	eShop	10	39	70	0.02
3,7	eShop	10	39	70	0.02
3,8	eShop	10	43	75	0.02
3,9	eShop	10	43	75	0.02
4	eShop	10	43	75	0.03
4,1	eShop	10	43	75	0.03
4,2	eShop	10	43	75	0.03
4,3	eShop	10	47	80	0.03
4,4	eShop	10	47	80	0.03
4,5	eShop	10	47	80	0.03
4,6	eShop	10	47	80	0.03
4,7	eShop	10	47	80	0.03
4,8	eShop	10	52	86	0.03
4,9	eShop	10	52	86	0.03
5	eShop	10	52	86	0.04
5,1	eShop	10	52	86	0.04
5,2	eShop	10	52	86	0.04
5,3	eShop	10	52	86	0.04
5,4	eShop	10	57	93	0.04
5,5	eShop	10	57	93	0.04
5,6	eShop	10	57	93	0.04
5,7	eShop	10	57	93	0.04
5,8	eShop	10	57	93	0.04
5,9	eShop	10	57	93	0.04
6	eShop	10	57	93	0.05
6,1	eShop	10	63	101	0.05

Ø D _c h8	11 4580		L _c	L	INOX > 900 N f
mm	TiAlN		mm	mm	mm/rev.
6,2	eShop	10	63	101	0.05
6,3	eShop	10	63	101	0.05
6,4	eShop	10	63	101	0.05
6,5	eShop	10	63	101	0.05
6,6	eShop	10	63	101	0.05
6,7	eShop	10	63	101	0.05
6,8	eShop	10	69	109	0.05
6,9	eShop	10	69	109	0.05
7	eShop	10	69	109	0.05
7,1	eShop	10	69	109	0.05
7,2	eShop	10	69	109	0.05
7,3	eShop	10	69	109	0.05
7,4	eShop	10	69	109	0.05
7,5	eShop	10	69	109	0.05
7,6	eShop	5	75	117	0.05
7,7	eShop	5	75	117	0.05
7,8	eShop	5	75	117	0.05
7,9	eShop	5	75	117	0.05
8	eShop	5	75	117	0.09
8,1	eShop	5	75	117	0.09
8,2	eShop	5	75	117	0.09
8,3	eShop	5	75	117	0.09
8,4	eShop	5	75	117	0.09
8,5	eShop	5	75	117	0.09
8,6	eShop	5	81	125	0.09
8,7	eShop	5	81	125	0.09
8,8	eShop	5	81	125	0.09
8,9	eShop	5	81	125	0.09
9	eShop	5	81	125	0.09
9,1	eShop	5	81	125	0.09
9,2	eShop	5	81	125	0.09
9,3	eShop	5	81	125	0.09
9,4	eShop	5	81	125	0.09
9,5	eShop	5	81	125	0.09
9,6	eShop	5	87	133	0.09
9,7	eShop	5	87	133	0.09
9,8	eShop	5	87	133	0.09
9,9	eShop	5	87	133	0.09
10	eShop	5	87	133	0.09
10,1	eShop	5	87	133	0.09
10,2	eShop	5	87	133	0.09
10,5	eShop	5	87	133	0.09
10,8	eShop	5	94	142	0.09
11	eShop	5	94	142	0.09
11,2	eShop	5	94	142	0.09
11,5	eShop	5	94	142	0.09
11,8	eShop	5	94	142	0.09
12	eShop	5	101	151	0.13
12,2	eShop	5	101	151	0.13
12,5	eShop	5	101	151	0.13
13	eShop	5	101	151	0.13

HSS
E-PMDIN
338

h8



HPC

Garant HPC jobber drill

High-performance HPC twist drills for high-alloy and high tensile materials. Particularly strong due to **strengthened core** and a **parabolic flute profile**. Point geometry with rake angle correction. Precise concentricity for exact holes.

11 4620 – Dimensions similar to DIN 338.

Shank to DIN 1835A.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$

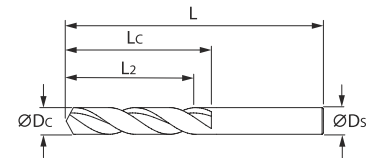


11 4610



11 4620

h6
DIN
1835A



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
11 4610/4620	80	70	60		50	40	25	14					20	15	12	50	60						

Ø D _c h8	11 4610	11 4620		L _c	L	Ø D _s	f
mm	TiAlN	TiAlN		mm	mm	mm	mm/rev.
1	eShop	—	5	12	34	—	0.03
1,1	eShop	—	5	14	36	—	0.03
1,2	eShop	—	5	16	38	—	0.03
1,3	eShop	—	5	16	38	—	0.03
1,4	eShop	—	5	18	40	—	0.03
1,5	eShop	—	5	18	40	—	0.03
1,6	eShop	—	5	20	43	—	0.03
1,7	eShop	—	5	20	43	—	0.03
1,8	eShop	—	5	22	46	—	0.03
1,9	eShop	—	5	22	46	—	0.03
2	eShop	eShop	5	24	49	56	3
2,1	eShop	eShop	5	24	49	56	3
2,2	eShop	—	5	27	53	—	0.03
2,3	eShop	eShop	5	27	53	59	3
2,4	eShop	eShop	5	30	57	62	3
2,5	eShop	eShop	5	30	57	62	3
2,6	eShop	eShop	5	30	57	62	3
2,7	eShop	eShop	5	33	61	65	3
2,8	eShop	eShop	5	33	61	65	3
2,9	eShop	eShop	5	33	61	65	3
3	eShop	eShop	10	33	61	65	3
3,1	eShop	—	10	36	65	—	0.03
3,2	eShop	eShop	10	36	65	68	4
3,3	eShop	eShop	10	36	65	68	4
3,4	eShop	—	10	39	70	—	0.03
3,5	eShop	eShop	10	39	70	71	4
3,6	eShop	—	10	39	70	—	0.03
3,7	eShop	eShop	10	39	70	71	4
3,8	eShop	eShop	10	43	75	75	4
3,9	eShop	—	10	43	75	—	0.03
4	eShop	eShop	10	43	75	75	4
4,1	eShop	—	10	43	75	—	0.05
4,2	eShop	eShop	10	43	75	87	6
4,3	eShop	—	10	47	80	—	0.05
4,4	eShop	—	10	47	80	—	0.05
4,5	eShop	eShop	10	47	80	91	6
4,6	eShop	—	10	47	80	—	0.05
4,65	—	eShop	10	47	—	91	6
4,7	eShop	—	10	47	80	—	0.05
4,8	eShop	eShop	10	52	86	96	6
4,9	eShop	—	10	52	86	—	0.05
5	eShop	eShop	10	52	86	96	6
5,1	eShop	—	10	52	86	—	0.05
5,2	eShop	eShop	10	52	86	96	6
5,3	eShop	—	10	52	86	—	0.05
5,4	eShop	—	10	57	93	—	0.05
5,5	eShop	eShop	10	57	93	101	6
5,55	—	eShop	10	57	—	101	6
5,6	eShop	—	10	57	93	—	0.05
5,7	eShop	—	10	57	93	—	0.05
5,8	eShop	eShop	10	57	93	101	6
5,9	eShop	—	10	57	93	—	0.05
6	eShop	eShop	10	57	93	101	6

Ø D _c h8	11 4610	11 4620		L _c	L	Ø D _s	f
mm	TiAlN	TiAlN		mm	mm	mm	mm/rev.
6,1	eShop	—	10	63	101	—	0.08
6,2	eShop	eShop	10	63	101	107	8
6,3	eShop	—	10	63	101	—	0.08
6,4	eShop	—	10	63	101	—	0.08
6,5	eShop	eShop	10	63	101	107	8
6,6	eShop	—	10	63	101	—	0.08
6,7	eShop	—	10	63	101	—	0.08
6,8	eShop	eShop	10	69	109	113	8
6,9	eShop	—	10	69	109	—	0.08
7	eShop	eShop	10	69	109	113	8
7,1	eShop	—	10	69	109	—	0.08
7,2	eShop	—	10	69	109	—	0.08
7,3	eShop	—	10	69	109	—	0.08
7,4	eShop	—	10	69	109	—	0.08
7,5	eShop	eShop	10	69	109	113	8
7,6	eShop	—	5	75	117	—	0.08
7,7	eShop	—	5	75	117	—	0.08
7,8	eShop	eShop	5	75	117	119	8
7,9	eShop	—	5	75	117	—	0.08
8	eShop	eShop	5	75	117	119	8
8,1	eShop	—	5	75	117	—	0.11
8,2	eShop	—	5	75	117	—	0.11
8,3	eShop	—	5	75	117	—	0.11
8,4	eShop	—	5	75	117	—	0.11
8,5	eShop	eShop	5	75	117	125	10
8,6	eShop	—	5	81	125	—	0.11
8,7	eShop	—	5	81	125	—	0.11
8,8	eShop	—	5	81	125	—	0.11
8,9	eShop	—	5	81	125	—	0.11
9	eShop	eShop	5	81	125	131	10
9,1	eShop	—	5	81	125	—	0.11
9,2	eShop	—	5	81	125	—	0.11
9,3	eShop	—	5	81	125	—	0.11
9,4	eShop	—	5	81	125	—	0.11
9,5	eShop	eShop	5	81	125	131	10
9,6	eShop	—	5	87	133	—	0.11
9,7	eShop	—	5	87	133	—	0.11
9,8	eShop	—	5	87	133	—	0.11
9,9	eShop	—	5	87	133	—	0.11
10	eShop	eShop	5	87	133	137	10
10,1	eShop	—	5	87	133	—	0.11
10,2	eShop	eShop	5	87	133	144	12
10,5	eShop	eShop	5	87	133	144	12
10,8	eShop	—	5	94	142	—	0.11
11	eShop	eShop	5	94	142	151	12
11,2	eShop	—	5	94	142	—	0.11
11,5	eShop	—	5	94	142	—	0.11
11,8	eShop	eShop	5	94	142	151	12
12	eShop	eShop	5	101	151	158	12
12,2	eShop	—	5	101	151	—	0.17
12,5	eShop	—	5	101	151	—	0.17
13	eShop	eShop	5	101	151	161	14



11

h8



Jobber drill sets, DIN 338

Composed of jobber drills DIN 338.

11 5000/5051/5120 Size 1-10C – **Large assortment case**

from 1 mm – 10 mm, with 150 jobber drills:

10 pcs. each Ø 1 – 6,

5 pcs. each Ø 6.5 – 10.

Ideal for sitework and workshop use.



11 5000_1-13

11 5000_1-13KB
with core hole-Ø
(3.3; 4.2; 6.8; 10.2)

11 5000_1-10C

HSS

Type
N

Type		1-6	6-10	1-10	1-10,5	1-13	1-13KB	1-10C
12B 11 5000	HOLEX Jobber drill set HSS No. 114000 in a case	eShop	eShop	eShop	eShop	eShop	eShop	eShop
12B 11 5020	HOLEX Jobber drill set HSS No. 114000 as refill set	eShop	eShop	eShop	eShop	eShop	eShop	–
Drill range	mm	1 – 6	6 – 10	1 – 10	1 – 10.5	1 – 13	1 – 13	1 – 10
Number of drills		51	41	19	24	25	29	150
Tapping hole Ø	mm	–	–	–	3.3; 4.2; 6.8; 10.2	–	3.3; 4.2; 6.8; 10.2	–
Incremental steps of drills	mm	0.1	0.1	0.5	0.5	0.5	0.5	0.5

HSS

DIN
338Type
N

Type		1-10	1-13
12B 11 5030	HOLEX Jobber drill set HSS No. 114020 in a case	eShop	eShop
12B 11 5032	HOLEX Jobber drill set HSS No. 114020 as refill set	eShop	eShop
Drill range	mm	1 – 10	1 – 13
Number of drills		19	25
Incremental steps of drills	mm	0.5	0.5

HSS

DIN
338Type
N

≥ 3 mm



Type		1-6	6-10	1-10	1-10,5	1-13	1-13KB	1-10C
12B 11 5051	HOLEX HOLEX CleverDrill jobber drill set HSS No. 114031 in a case	eShop	eShop	eShop	eShop	eShop	eShop	eShop
12B 11 5056	HOLEX HOLEX CleverDrill HSS jobber drill set No. 114031 as a refill set	eShop	eShop	eShop	eShop	eShop	eShop	–
Drill range	mm	1 – 6	6 – 10	1 – 10	1 – 10.5	1 – 13	1 – 13	1 – 10
Number of drills		51	41	19	24	25	29	150
Tapping hole Ø	mm	–	–	–	3.3; 4.2; 6.8; 10.2	–	3.3; 4.2; 6.8; 10.2	–
Incremental steps of drills	mm	0.1	0.1	0.5	0.5	0.5	0.5	0.5

HSS

DIN
338Type
N

≥ 4 mm



Type		1-6	6-10	1-10	1-13	1-13KB	1-10C
11B 11 5120	Garant Jobber drill set HSS No. 114150 in a case	eShop	eShop	eShop	eShop	eShop	eShop
11B 11 5140	Garant Jobber drill set HSS No. 114150 as refill set	eShop	eShop	eShop	eShop	eShop	–
Drill range	mm	1 – 6	6 – 10	1 – 10	1 – 13	1 – 13	1 – 10
Number of drills		51	41	19	25	29	150
Tapping hole Ø	mm	–	–	–	–	3.3; 4.2; 6.8; 10.2	–
Incremental steps of drills	mm	0.1	0.1	0.5	0.5	0.5	0.5

HSS

DIN
338Type
W

≥ 2 mm



Type		1-6	6-10	1-10	1-13
11B 11 5160	Garant Jobber drill set HSS No. 114200 in a case	eShop	eShop	eShop	eShop
Drill range	mm	1 – 6	6 – 10	1 – 10	1 – 13
Number of drills		51	41	19	25
Incremental steps of drills	mm	0.1	0.1	0.5	0.5

HSS	DIN 338	Type N	
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Type				1-6	6-10	1-10	1-10,5	1-13	1-13KB
^{12B} 11 5245		Jobber drill set HSS No. 114360 in a case	TiN	eShop	eShop	eShop	eShop	eShop	eShop
^{12B} 11 5265		Jobber drill set HSS No. 114360 as refill set	TiN	eShop	eShop	eShop	eShop	eShop	eShop
Drill range	mm			1 – 6	6 – 10	1 – 10	1 – 10,5	1 – 13	1 – 13
Number of drills				51	41	19	24	25	29
Tapping hole Ø	mm			–	–	–	3,3; 4,2; 6,8; 10,2	–	3,3; 4,2; 6,8; 10,2
Incremental steps of drills	mm			0.1	0.1	0.5	0.5	0.5	0.5

HSS E	DIN 338	Type N	
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Type				1-6	6-10	1-10	1-10,5	1-13	1-13KB
^{11B} 11 5280		Jobber drill set HSS-E No. 114400 in a case		eShop	eShop	eShop	eShop	eShop	eShop
^{11B} 11 5300		Jobber drill set HSS-E No. 114400 as refill set		eShop	eShop	eShop	eShop	eShop	eShop
Drill range	mm			1 – 6	6 – 10	1 – 10	1 – 10,5	1 – 13	1 – 13
Number of drills				51	41	19	24	25	29
Tapping hole Ø	mm			–	–	–	3,3; 4,2; 6,8; 10,2	–	3,3; 4,2; 6,8; 10,2
Incremental steps of drills	mm			0.1	0.1	0.5	0.5	0.5	0.5

HSS E	DIN 338	Type N	
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Type				1-10	1-13
^{12B} 11 5305		Jobber drill set HSS-E No. 114405 in a case		eShop	eShop
^{12B} 11 5315		Jobber drill set HSS-E No. 114405 as refill set		eShop	eShop
Drill range	mm			1 – 10	1 – 13
Number of drills				19	25
Incremental steps of drills	mm			0.5	

HSS E	DIN 338	Type FS	
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Type				1-10	1-13
^{11B} 11 5320		Jobber drill set HSS-E No. 114450 in a case		eShop	eShop
Drill range	mm			1 – 10	1 – 13
Number of drills				19	25
Incremental steps of drills	mm			0.5	

HSS E	DIN 338		
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Type				1-10	1-13
^{11B} 11 5350		Jobber drill set HSS-E No. 114500 in a case	TiAIN	eShop	eShop
^{11B} 11 5355		Jobber drill set HSS-E No. 114500 as refill set	TiAIN	eShop	eShop
Drill range	mm			1 – 10	1 – 13
Number of drills				19	25
Incremental steps of drills	mm			0.5	



11



Type				1-10	1-13	1-13KB
^{11B} 11 5370	Garant	HSS-Co8 jobber drill set No. 114550 in a case	TiAIN	eShop	eShop	eShop
^{11B} 11 5375		HSS-Co8 jobber drill set No. 114550 as a refill set	TiAIN	eShop	eShop	eShop
Drill range		mm		1 – 10	1 – 13	1 – 13
Number of drills				19	25	29
Tapping hole Ø		mm		–	–	3.3; 4.2; 6.8; 10.2
Incremental steps of drills		mm			0.5	



Type				1-6	6-10	1-10	1-13
^{11B} 11 5450	Garant	Jobber drill set HSS-E No. 114580 in a case	TiAIN	eShop	eShop	eShop	eShop
Drill range		mm		1 – 6	6 – 10	1 – 10	1 – 13
Number of drills				51	41	19	25
Incremental steps of drills		mm		0.1	0.1	0.5	0.5



Type				1-10	1-13
^{11B} 11 5465	Garant	Jobber drill set HSS-E-PM No. 114610 in a case	TiAIN	eShop	eShop
Drill range		mm		1 – 10	1 – 13
Number of drills				19	25
Incremental steps of drills		mm			0.5

Cases and plastic stands, empty

For filling with refill sets, suitable for jobber drills to DIN 338.

Size 1-10,5; 1-13KB – With additional capacity for intermediate sizes Ø 3.3 / 4.2 / 6.8 / 10.2 (tapping drill hole sizes).



11 5480_1-5



11 5475_1-10,5



11 5470_1-10



11 5470_1-10C

Type				1-6	6-10	1-10	1-10,5	1-5	5,1-10	1-13	1-13KB	1-10C
^{11B} 11 5470	Garant			eShop	eShop	eShop	eShop	–	–	eShop	eShop	eShop
^{12B} 11 5475		Empty case for jobber drills to DIN 338		eShop	eShop	eShop	eShop	–	–	eShop	eShop	eShop
^{12B} 11 5480	HOLEX			–	–	–	–	eShop	eShop	eShop	–	–
for drills		mm		1 – 6	6 – 10	1 – 10	1 – 10,5	1 – 5	5,1 – 10	1 – 13	1 – 13	1 – 10
Incremental steps of drills		mm		0.1	0.1	0.5	0.5	0.1	0.1	0.5	0.5	0.5



Long jobber drills, deep hole drills, plain shank

- 11 6000 – Vaporized from 2.4 mm.
Particularly for deep hole drilling (for deep holes, repeated chip evacuation is necessary).
- 11 6040 – Strengthened core **without core taper**.
Precision ground point.
Wide flutes with heavily honed back edges.
Bright ground surface finish.
- 11 6051 – **HOLEX CleverDrill** –
Sturdy drill for all standard applications. Improved spot drilling behaviour due to cross-ground form.
Standard core thickness and core taper.
Profile ground.
Surface: Bronze-coloured tempered helical flutes.



≥ 4 mm



≥ 2.5 mm



≥ 2.5 mm



11 6000



Type N



11 6040



Type W



11 6051



Type N

Advantage:

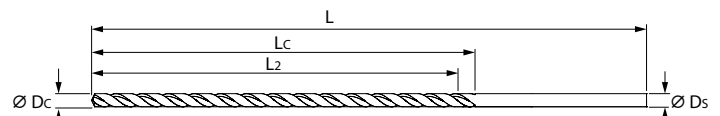
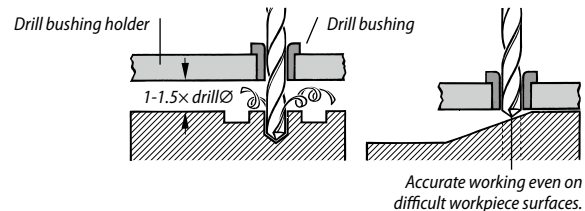
- 11 6000 – Especially suitable for **long reach purposes**.
(When used to drill deep holes, low feed rates and frequent drill pecks are necessary).
- 11 6040 – For deep hole drilling and for use with drill bushings.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$

Note:

11 6051 – **Successor product to No. 11 6050.**



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 6000	64	52	40	40	30	25											25		•	•			
11 6040	70	45	40																•	•			
11 6051	64	52	40	26	26	20	15										24	32	•	•			

Ø D _c 8	11B 11 6000	11B 11 6040	12B 11 6051		L _c	L	Ø D _c 8	11B 11 6000	11B 11 6040	12B 11 6051		L _c	L
	Garant		HOLEX					Garant		HOLEX			
	Jobber drill long HSS		HOLEX CleverDrill jobber drill, long, HSS					Jobber drill long HSS		HOLEX CleverDrill jobber drill, long, HSS			
mm	N	W	N		mm	mm	mm	N	W	N		mm	mm
0,6	eShop	—	—	5	15	35	4,1	eShop	—	eShop	10	78	119
0,8	eShop	—	—	5	25	46	4,2	eShop	eShop	eShop	10	78	119
1	eShop	—	—	5	33	56	4,5	eShop	eShop	eShop	10	82	126
1,1	eShop	—	—	5	37	60	4,8	eShop	—	eShop	10	87	132
1,2	eShop	—	—	5	41	65	5	eShop	eShop	eShop	10	87	132
1,3	eShop	—	—	5	41	65	5,1	—	—	eShop	10	87	132
1,4	eShop	—	—	5	45	70	5,2	eShop	—	—	10	87	132
1,5	eShop	—	—	5	45	70	5,5	eShop	eShop	eShop	10	91	139
1,6	eShop	—	—	5	50	76	5,8	eShop	—	eShop	10	91	139
1,7	eShop	—	—	5	50	76	6	eShop	eShop	eShop	10	91	139
1,8	eShop	—	—	5	53	80	6,2	eShop	—	eShop	10	97	148
1,9	eShop	—	—	5	53	80	6,5	eShop	eShop	eShop	10	97	148
2	eShop	—	eShop	5	56	85	6,8	eShop	—	eShop	5	102	156
2,1	eShop	—	eShop	5	56	85	7	eShop	eShop	eShop	5	102	156
2,2	eShop	—	eShop	5	59	90	7,2	eShop	—	eShop	5	102	156
2,3	eShop	—	eShop	5	59	90	7,5	eShop	eShop	eShop	5	102	156
2,4	eShop	—	eShop	5	62	95	7,8	eShop	—	eShop	5	109	165
2,5	eShop	eShop	eShop	5	62	95	8	eShop	eShop	eShop	5	109	165
2,6	eShop	—	eShop	5	62	95	8,2	eShop	—	eShop	5	109	165
2,7	eShop	—	eShop	5	66	100	8,5	eShop	eShop	eShop	5	109	165
2,8	eShop	—	eShop	5	66	100	9	eShop	eShop	eShop	5	115	175
2,9	eShop	—	eShop	5	66	100	9,5	eShop	—	eShop	5	115	175
3	eShop	eShop	eShop	10	66	100	9,8	eShop	—	eShop	5	121	184
3,1	eShop	—	eShop	10	69	106	10	eShop	eShop	eShop	5	121	184
3,2	eShop	eShop	eShop	10	69	106	10,5	eShop	—	eShop	1	121	184
3,3	eShop	eShop	eShop	10	69	106	11	eShop	—	eShop	1	128	195
3,4	eShop	—	eShop	10	73	112	11,5	eShop	—	eShop	1	128	195
3,5	eShop	eShop	eShop	10	73	112	12	eShop	—	eShop	1	134	205
3,6	eShop	—	eShop	10	73	112	12,5	eShop	—	eShop	1	134	205
3,7	eShop	—	eShop	10	73	112	13	eShop	—	eShop	1	134	205
3,8	eShop	—	eShop	10	78	119	14	eShop	—	eShop	1	140	214
3,9	eShop	—	eShop	10	78	119	15	eShop	—	eShop	1	144	220
4	eShop	eShop	eShop	10	78	119	16	eShop	—	eShop	1	149	227



Garant Deep hole drills, plain shank

Significantly **strengthened core** without taper.

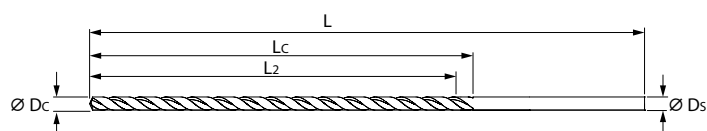
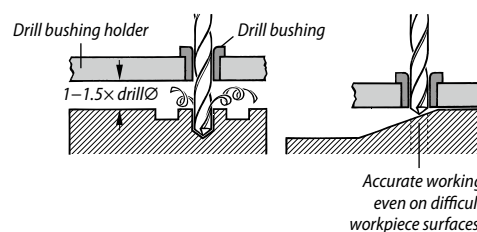
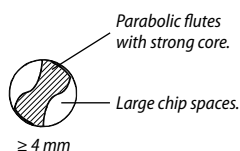
Precision ground point.

With **specially shaped slots**. Designed for deep holes up to $10 \times D$ and materials with critical chip formation characteristics.

11 6063 – With **TiAlN coating** for long tool lives.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 6061	70	45		28	21	18										25						
11 6063	87	56	50	31	23	20	12								6	31						

Ø D _c h8	11 6061	11 6063		L _c	L	f	f
	Deep hole drill HSS-E					11 6061 mm/rev.	11 6063 mm/rev.
mm		TiAlN		mm	mm		
1	eShop	eShop	5	33	56	0.05	0.03
1,1	eShop	eShop	5	37	60	0.05	0.03
1,2	eShop	eShop	5	41	65	0.05	0.03
1,3	eShop	eShop	5	41	65	0.05	0.03
1,4	eShop	eShop	5	45	70	0.05	0.03
1,5	eShop	eShop	5	45	70	0.05	0.03
1,6	eShop	eShop	5	50	76	0.05	0.03
1,7	eShop	eShop	5	50	76	0.05	0.03
1,8	eShop	eShop	5	53	80	0.05	0.03
1,9	eShop	eShop	5	53	80	0.05	0.03
2	eShop	eShop	5	56	85	0.05	0.03
2,1	eShop	eShop	5	56	85	0.05	0.03
2,2	eShop	eShop	5	59	90	0.05	0.03
2,3	eShop	eShop	5	59	90	0.05	0.03
2,4	eShop	eShop	5	62	95	0.05	0.03
2,5	eShop	eShop	5	62	95	0.05	0.03
2,6	eShop	eShop	5	62	95	0.05	0.03
2,7	eShop	eShop	5	66	100	0.05	0.03
2,8	eShop	eShop	5	66	100	0.05	0.03
2,9	eShop	eShop	5	66	100	0.05	0.03
3	eShop	eShop	10	66	100	0.05	0.03
3,1	eShop	eShop	10	69	106	0.05	0.03
3,2	eShop	eShop	10	69	106	0.05	0.03
3,3	eShop	eShop	10	69	106	0.05	0.03
3,4	eShop	eShop	10	73	112	0.05	0.03
3,5	eShop	eShop	10	73	112	0.05	0.03
3,6	eShop	eShop	10	73	112	0.05	0.03
3,7	eShop	eShop	10	73	112	0.05	0.03
3,8	eShop	eShop	10	78	119	0.05	0.03
3,9	eShop	eShop	10	78	119	0.05	0.03
4	eShop	eShop	10	78	119	0.05	0.05

Ø D _c h8	11 6061	11 6063		L _c	L	f	f
	Deep hole drill HSS-E					11 6061 mm/rev.	11 6063 mm/rev.
mm		TiAlN		mm	mm		
4,2	eShop	eShop	10	78	119	0.05	0.05
4,5	eShop	eShop	10	82	126	0.05	0.05
4,8	eShop	eShop	10	87	132	0.05	0.05
5	eShop	eShop	10	87	132	0.05	0.05
5,2	eShop	eShop	10	87	132	0.05	0.05
5,5	eShop	eShop	10	91	139	0.05	0.05
5,8	eShop	eShop	10	91	139	0.05	0.05
6	eShop	eShop	10	91	139	0.12	0.08
6,2	eShop	—	10	97	148	0.12	—
6,5	eShop	eShop	10	97	148	0.12	0.08
6,8	eShop	eShop	5	102	156	0.12	0.08
7	eShop	eShop	5	102	156	0.12	0.08
7,2	eShop	—	5	102	156	0.12	—
7,5	eShop	eShop	5	102	156	0.12	0.08
7,8	eShop	eShop	5	109	165	0.12	0.08
8	eShop	eShop	5	109	165	0.2	0.11
8,2	eShop	—	5	109	165	0.2	—
8,5	eShop	eShop	5	109	165	0.2	0.11
9	eShop	eShop	5	115	175	0.2	0.11
9,5	eShop	eShop	5	115	175	0.2	0.11
9,8	eShop	eShop	5	121	184	0.2	0.11
10	eShop	eShop	5	121	184	0.2	0.11
10,2	eShop	—	1	121	184	0.2	—
10,5	eShop	eShop	1	121	184	0.2	0.11
11	eShop	eShop	1	128	195	0.2	0.11
11,5	eShop	eShop	1	128	195	0.2	0.11
12	eShop	eShop	1	134	205	0.25	0.17
12,5	eShop	eShop	1	134	205	0.25	0.17
13	eShop	eShop	1	134	205	0.25	0.17
14	eShop	—	1	140	214	0.25	—



Garant Jobber drills, long, plain shank

Profile ground. Standard core thickness and core taper. Bright finish.

Advantage: For drilling with drill bushes or long reach applications.

11 6065 – For high-tensile tempered steels, **including TOOLOX.**

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



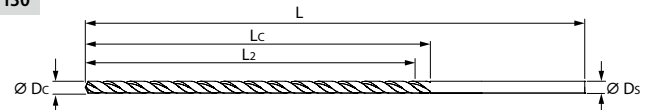
≥ 2 mm



11 6065



11 6070



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
11 6065					30	25	10	8					8	5	12	8	5	80					
11 6070				40	20										12	8	5						

Ø D _c h8	11 6065	11 6070		L _c	L		
mm	N	VA		mm	mm	11 6065 mm/rev.	11 6070 mm/rev.
1	eShop	eShop	5	33	56	0.01	0.01
1,1	eShop	eShop	5	37	60	0.01	0.01
1,2	eShop	eShop	5	41	65	0.01	0.01
1,3	eShop	eShop	5	41	65	0.01	0.01
1,4	eShop	eShop	5	45	70	0.01	0.01
1,5	eShop	eShop	5	45	70	0.01	0.01
1,6	eShop	eShop	5	50	76	0.01	0.01
1,7	eShop	eShop	5	50	76	0.01	0.01
1,8	eShop	eShop	5	53	80	0.01	0.01
1,9	eShop	eShop	5	53	80	0.01	0.01
2	eShop	eShop	5	56	85	0.02	0.02
2,1	eShop	eShop	5	56	85	0.02	0.02
2,2	eShop	eShop	5	59	90	0.02	0.02
2,3	eShop	eShop	5	59	90	0.02	0.02
2,4	eShop	eShop	5	62	95	0.02	0.02
2,5	eShop	eShop	5	62	95	0.02	0.02
2,6	eShop	eShop	5	62	95	0.02	0.02
2,7	eShop	eShop	5	66	100	0.02	0.02
2,8	eShop	eShop	5	66	100	0.02	0.02
2,9	eShop	eShop	5	66	100	0.02	0.02
3	eShop	eShop	10	66	100	0.02	0.02
3,1	eShop	eShop	10	69	106	0.02	0.02
3,2	eShop	eShop	10	69	106	0.02	0.02
3,3	eShop	eShop	10	69	106	0.02	0.02
3,4	eShop	eShop	10	73	112	0.02	0.02
3,5	eShop	eShop	10	73	112	0.02	0.02
3,6	eShop	eShop	10	73	112	0.02	0.02
3,7	eShop	eShop	10	73	112	0.02	0.02
3,8	eShop	eShop	10	78	119	0.02	0.02
3,9	eShop	eShop	10	78	119	0.02	0.02
4	eShop	eShop	10	78	119	0.05	0.05
4,1	—	eShop	10	78	119	—	0.05
4,2	eShop	eShop	10	78	119	0.05	0.05
4,3	—	eShop	10	82	126	—	0.05
4,4	—	eShop	10	82	126	—	0.05
4,5	eShop	eShop	10	82	126	0.05	0.05
4,6	—	eShop	10	82	126	—	0.05
4,7	—	eShop	10	82	126	—	0.05
4,8	eShop	eShop	10	87	132	0.05	0.05
4,9	—	eShop	10	87	132	—	0.05
5	eShop	eShop	10	87	132	0.05	0.05
5,1	—	eShop	10	87	132	—	0.05
5,2	eShop	eShop	10	87	132	0.05	0.05
5,3	—	eShop	10	87	139	—	0.05
5,4	—	eShop	10	91	139	—	0.05
5,5	eShop	eShop	10	91	139	0.05	0.05
5,6	—	eShop	10	91	139	—	0.05
5,7	—	eShop	10	91	139	—	0.05
5,8	eShop	eShop	10	91	139	0.05	0.05

Ø D _c h8	11 6065	11 6070		L _c	L		
mm	N	VA		mm	mm	11 6065 mm/rev.	11 6070 mm/rev.
5,9	—	eShop	10	91	139	—	0.05
6	eShop	eShop	10	91	139	0.05	0.05
6,1	—	eShop	10	97	148	—	0.05
6,2	eShop	eShop	10	97	148	0.05	0.05
6,3	—	eShop	10	97	148	—	0.05
6,4	—	eShop	10	97	148	—	0.05
6,5	eShop	eShop	10	97	148	0.05	0.05
6,6	—	eShop	10	97	148	—	0.05
6,7	—	eShop	10	97	148	—	0.05
6,8	eShop	eShop	5	102	156	0.05	0.05
6,9	—	eShop	5	102	156	—	0.05
7	eShop	eShop	5	102	156	0.05	0.05
7,1	—	eShop	5	102	156	—	0.05
7,3	—	eShop	5	102	156	—	0.05
7,4	—	eShop	5	102	156	—	0.05
7,5	eShop	eShop	5	102	156	0.05	0.05
7,6	—	eShop	5	109	165	—	0.05
7,7	—	eShop	5	109	165	—	0.05
7,8	eShop	eShop	5	109	165	0.05	0.05
7,9	—	eShop	5	109	165	—	0.05
8	eShop	eShop	5	109	165	0.08	0.08
8,1	—	eShop	5	109	165	—	0.08
8,2	eShop	eShop	5	109	165	0.08	0.08
8,3	—	eShop	5	109	165	—	0.08
8,4	—	eShop	5	109	165	—	0.08
8,5	eShop	eShop	5	109	165	0.08	0.08
8,6	—	eShop	5	115	175	—	0.08
8,7	—	eShop	5	115	175	—	0.08
8,8	—	eShop	5	115	175	—	0.08
8,9	—	eShop	5	115	175	—	0.08
9	eShop	eShop	5	115	175	0.08	0.08
9,1	—	eShop	5	115	175	—	0.08
9,2	—	eShop	5	115	175	—	0.08
9,3	—	eShop	5	115	175	—	0.08
9,4	—	eShop	5	115	175	—	0.08
9,5	eShop	eShop	5	115	175	0.08	0.08
9,6	—	eShop	5	121	184	—	0.08
9,7	—	eShop	5	121	184	—	0.08
9,8	eShop	eShop	5	121	184	0.08	0.08
9,9	—	eShop	5	121	184	—	0.08
10	eShop	eShop	5	121	184	0.08	0.08
10,2	eShop	eShop	1	121	184	0.08	0.08
10,5	eShop	eShop	1	121	184	0.08	0.08
10,8	—	eShop	1	128	195	—	0.08
11	eShop	eShop	1	128	195	0.08	0.08
11,2	—	eShop	1	128	195	—	0.08
11,5	eShop	eShop	1	128	195	0.08	0.08
11,8	—	eShop	1	128	195	—	0.08
12	eShop	eShop	1	134	205	0.12	0.12



Garant Extra long jobber drills plain shank HSS-E

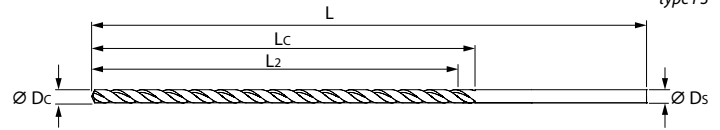
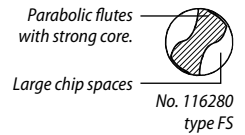
Advantage:

11 6280 – Particularly suitable for drilling under difficult conditions, e.g. insufficient cooling of the cutting edges due to poor chip evacuation.

11 6285 – Flute length to DIN 340. For high-tensile tempered steels, including TOOLOX.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX < 900 N	INOX > 900 N	CuZn				
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M	N				
11 6280	60		38	38	28	22															
11 6285			38	28	22		7	5					10	8	10	5	70				

Ø D _c h8 × overall length L	11B	11 6280	11B	11 6285	L _c	L	 < 750 N f			
	Jobber drill, extra long HSS-E									
	FS		N							
mm	TiAlN		TiAlN		11 6280	11 6285	mm	mm	mm	mm/rev.
3×150	eShop		eShop		100	66	150	0.05		
3×190	eShop		—		130	—	190	0.05		
3,5×165	eShop		—		115	—	165	0.05		
3,5×210	eShop		—		145	—	210	0.05		
4×175	eShop		eShop		120	78	175	0.05		
4×220	eShop		—		150	—	220	0.05		
4×280	eShop		eShop		190	78	280	0.05		
4,5×185	eShop		—		125	—	185	0.05		
4,5×235	eShop		—		160	—	235	0.05		
5×195	eShop		eShop		135	87	195	0.07		
5×245	eShop		—		170	—	245	0.07		
5×315	eShop		eShop		210	87	315	0.07		
5,5×205	eShop		—		140	—	205	0.07		
5,5×260	eShop		—		180	—	260	0.07		
6×205	eShop		eShop		140	91	205	0.07		
6×260	eShop		—		180	—	260	0.07		
6×330	eShop		eShop		225	91	330	0.07		

Ø D _c h8 × overall length L	11B	11 6280	11B	11 6285	L _c	L	 < 750 N f			
	Jobber drill, extra long HSS-E									
	FS		N							
mm	TiAlN		TiAlN		11 6280	11 6285	mm	mm	mm	mm/rev.
6,5×275	eShop		—		190	—	275	0.07		
6,8×225	eShop		—		155	—	225	0.07		
7×225	eShop		—		155	—	225	0.07		
7×290	eShop		—		200	—	290	0.07		
7,5×290	eShop		—		200	—	290	0.07		
8×240	eShop		eShop		165	109	240	0.1		
8×305	eShop		—		210	—	305	0.1		
8×390	eShop		eShop		265	109	390	0.1		
8,5×240	eShop		—		165	—	240	0.1		
8,5×305	eShop		—		210	—	305	0.1		
9×250	eShop		—		175	—	250	0.1		
9×320	eShop		—		220	—	320	0.1		
9,5×320	eShop		—		220	—	320	0.1		
10×265	eShop		eShop		185	121	265	0.1		
10×340	eShop		—		235	—	340	0.1		
10×430	eShop		eShop		295	121	430	0.1		
10,2×340	eShop		—		235	—	340	0.1		

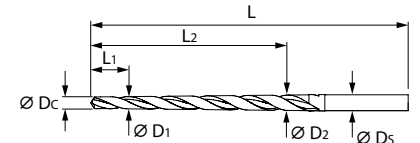
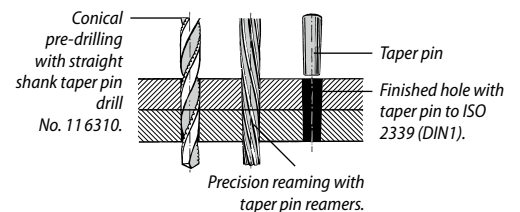


Garant Taper pin drills, plain shank

Conically increasing cutting edges with chip breaker flutes on the circumference. Special surface treatment.

Advantage: Conical holes 1:50 for taper pins to ISO 2339 (DIN 1) and ISO 8736 (DIN 7978) can be drilled in a single operation.

Note: Ø1.5; 2; 2.5 available with plain shank on request.
Ø14; 16; 20; 25 available with MT shank on request.
For finishing use taper pin reamers No. 161200.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
11 6310				24	20													●	●			

Ø D _c	11B 11 6310	Ø D ₁	Ø D ₂	L ₁	L ₂	L	Ø D _s	< 750 N f
mm	Straight shank taper pin drill	mm	mm	mm	mm	mm	mm	mm/rev.
3	eShop	2.9	4.24	5	58	100	4	0.05
4	eShop	3.9	5.44	5	68	112	5	0.05
5	eShop	4.9	6.55	5	73	122	6.3	0.05
6	eShop	5.9	8.23	5	105	160	8	0.05

Ø D _c	11B 11 6310	Ø D ₁	Ø D ₂	L ₁	L ₂	L	Ø D _s	< 750 N f
mm	Straight shank taper pin drill	mm	mm	mm	mm	mm	mm	mm/rev.
8	eShop	7.9	11.07	5	145	207	10	0.05
10	eShop	9.9	13.74	5	175	245	12.5	0.07
12	eShop	11.8	16.37	10	210	290	16	0.07



Jobber drills with Morse taper shank

Special surface treatment, resulting in reduced tendency to edge build-up and improved chip evacuation.

11 6340 – Top quality high performance twist drills.

Cutting edge section ≤ 26.5 mm $\varnothing$ ground from solid,
 > 26.5 mm $\varnothing$ milled. This ensures high concentricity and pitch accuracy, and precision ground point up to 40 mm $\varnothing$.

Recommendation: Maximum drilling depth:

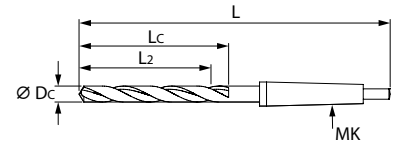
$$L_2 = L_c - 1.5 \times D_c$$



11 6340



11 6320



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G) 25	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 6320				40	30	25											25						
11 6340	45			40	30	25											25						

$\varnothing D_c$ h8	TTC 11 6340 Garant	T2C 11 6320 HOLEX	L _c	L	MT	f < 750 N
mm	Jobber drill HSS N		mm	mm		mm/rev.
5	eShop	—	52	133	1	0.07
5,5	eShop	—	57	138	1	0.07
6	eShop	—	57	138	1	0.07
6,5	eShop	—	63	144	1	0.07
7	eShop	—	69	150	1	0.07
7,5	eShop	—	69	150	1	0.07
8	eShop	—	75	156	1	0.1
8,5	eShop	—	75	156	1	0.1
9	eShop	—	81	162	1	0.1
9,5	eShop	—	81	162	1	0.1
9,8	eShop	—	87	168	1	0.1
10	eShop	—	87	168	1	0.1
10,25	eShop	—	87	168	1	0.1
10,5	eShop	—	87	168	1	0.1
10,75	eShop	—	94	175	1	0.1
11	eShop	—	94	175	1	0.1
11,25	eShop	—	94	175	1	0.1
11,5	eShop	—	94	175	1	0.1
11,75	eShop	—	94	175	1	0.1
12	eShop	—	101	182	1	0.16
12,25	eShop	—	101	182	1	0.16
12,5	eShop	—	101	182	1	0.16
12,75	eShop	—	101	182	1	0.16
13	eShop	eShop	101	182	1	0.16
13,25	eShop	—	108	189	1	0.16
13,5	eShop	eShop	108	189	1	0.16
13,75	eShop	eShop	108	189	1	0.16
14	eShop	eShop	108	189	1	0.16
14,25	eShop	eShop	114	212	2	0.16
14,5	eShop	eShop	114	212	2	0.16
14,75	eShop	—	114	212	2	0.16
15	eShop	eShop	114	212	2	0.16
15,25	eShop	eShop	120	218	2	0.16
15,5	eShop	eShop	120	218	2	0.16
15,75	eShop	eShop	120	218	2	0.16
16	eShop	eShop	120	218	2	0.2
16,25	eShop	eShop	125	223	2	0.2
16,5	eShop	eShop	125	223	2	0.2
16,75	eShop	—	125	223	2	0.2
17	eShop	eShop	125	223	2	0.2
17,25	eShop	—	130	228	2	0.2
17,5	eShop	eShop	130	228	2	0.2
17,75	eShop	eShop	130	228	2	0.2
18	eShop	eShop	130	228	2	0.2
18,25	eShop	—	135	233	2	0.2
18,5	eShop	eShop	135	233	2	0.2
18,75	eShop	—	135	233	2	0.2
19	eShop	eShop	135	233	2	0.2
19,25	eShop	—	140	238	2	0.2
19,5	eShop	eShop	140	238	2	0.2
19,75	eShop	eShop	140	238	2	0.2
20	eShop	eShop	140	238	2	0.2
20,25	eShop	—	145	243	2	0.2
20,5	eShop	eShop	145	243	2	0.2
20,75	eShop	—	145	243	2	0.2
21	eShop	eShop	145	243	2	0.2
21,25	eShop	—	150	248	2	0.2
21,5	eShop	eShop	150	248	2	0.2
21,75	eShop	—	150	248	2	0.2

$\varnothing D_c$ h8	TTC 11 6340 Garant	T2C 11 6320 HOLEX	L _c	L	MT	f < 750 N
mm	Jobber drill HSS N		mm	mm		mm/rev.
22	eShop	eShop	150	248	2	0.2
22,25	eShop	—	150	248	2	0.2
22,5	eShop	eShop	155	253	2	0.2
22,75	eShop	—	155	253	2	0.2
23	eShop	eShop	155	253	2	0.2
23,5	eShop	eShop	155	276	3	0.2
23,75	eShop	—	160	281	3	0.2
24	eShop	eShop	160	281	3	0.2
24,5	eShop	eShop	160	281	3	0.2
24,75	eShop	—	160	281	3	0.2
25	eShop	eShop	160	281	3	0.25
25,5	eShop	eShop	165	286	3	0.25
25,75	eShop	—	165	286	3	0.25
26	eShop	eShop	165	286	3	0.25
26,5	eShop	eShop	165	286	3	0.25
27	eShop	eShop	170	291	3	0.25
27,5	eShop	eShop	170	291	3	0.25
27,75	eShop	—	170	291	3	0.25
28	eShop	eShop	170	291	3	0.25
28,5	eShop	eShop	175	296	3	0.25
29	eShop	eShop	175	296	3	0.25
29,5	eShop	eShop	175	296	3	0.25
29,75	eShop	—	175	296	3	0.25
30	eShop	eShop	175	296	3	0.25
30,5	eShop	eShop	180	301	3	0.25
31	eShop	eShop	180	301	3	0.25
31,5	eShop	—	180	301	3	0.25
32	eShop	eShop	185	334	4	0.25
32,5	eShop	—	185	334	4	0.25
33	eShop	eShop	185	334	4	0.25
33,5	eShop	—	185	334	4	0.25
34	eShop	eShop	190	339	4	0.25
34,5	eShop	—	190	339	4	0.25
35	eShop	eShop	190	339	4	0.25
35,5	eShop	—	190	339	4	0.25
36	eShop	eShop	195	344	4	0.25
37	eShop	—	195	344	4	0.25
37,5	eShop	—	195	344	4	0.25
38	eShop	eShop	200	349	4	0.25
38,5	eShop	—	200	349	4	0.25
39	eShop	eShop	200	349	4	0.25
39,5	eShop	—	200	349	4	0.25
40	eShop	eShop	200	349	4	0.32
40,5	eShop	—	205	354	4	0.32
41	eShop	eShop	205	354	4	0.32
42	eShop	eShop	205	354	4	0.32
43	eShop	eShop	210	359	4	0.32
44	eShop	eShop	210	359	4	0.32
45	eShop	eShop	210	359	4	0.32
46	eShop	eShop	215	364	4	0.32
47	eShop	eShop	215	364	4	0.32
48	eShop	eShop	220	369	4	0.32
49	eShop	eShop	220	369	4	0.32
50	eShop	eShop	220	369	4	0.32
51	eShop	eShop	225	412	5	0.32
55	eShop	eShop	230	417	5	0.32
60	eShop	eShop	235	422	5	0.32
65	eShop	eShop	245	432	5	0.4
70	eShop	eShop	250	437	5	0.4



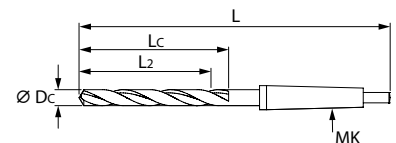
Garant Jobber drill with Morse taper shank, for high-tensile and stainless steels

With strengthened core.

Specially treated surface, reducing edge build up and improving chip evacuation.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 6360			40	30	25	10							12		5	25	80					

Ø D _c h8	TTC 11 6360 Jobber drill HSS-E	L _c	L	MT	f mm/rev.
mm	VA	mm	mm		
10	eShop	87	168	1	0.1
10,2	eShop	87	168	1	0.1
10,5	eShop	87	168	1	0.1
11	eShop	94	175	1	0.1
11,5	eShop	94	175	1	0.1
11,8	eShop	94	175	1	0.1
12	eShop	101	182	1	0.16
12,2	eShop	101	182	1	0.16
12,5	eShop	101	182	1	0.16
13	eShop	101	182	1	0.16
13,5	eShop	108	189	1	0.16
13,8	eShop	108	189	1	0.16
14	eShop	108	189	1	0.16
14,25	eShop	114	212	2	0.16
14,5	eShop	114	212	2	0.16
15	eShop	114	212	2	0.16
15,25	eShop	120	218	2	0.16
15,5	eShop	120	218	2	0.16
15,75	eShop	120	218	2	0.16
16	eShop	120	218	2	0.2
16,25	eShop	125	223	2	0.2
16,5	eShop	125	223	2	0.2
17	eShop	125	223	2	0.2
17,5	eShop	130	228	2	0.2
17,75	eShop	130	228	2	0.2
18	eShop	130	228	2	0.2
18,5	eShop	135	233	2	0.2

Ø D _c h8	TTC 11 6360 Jobber drill HSS-E	L _c	L	MT	f mm/rev.
mm	VA	mm	mm		
18,75	(eShop)	135	233	2	0.2
19	eShop	135	233	2	0.2
19,5	eShop	140	238	2	0.2
19,75	eShop	140	238	2	0.2
20	eShop	140	238	2	0.2
20,5	eShop	145	243	2	0.2
21	eShop	145	243	2	0.2
21,5	eShop	150	248	2	0.2
22	eShop	150	248	2	0.2
22,5	eShop	155	253	2	0.2
23	eShop	155	253	2	0.2
23,5	eShop	155	276	3	0.2
24	eShop	160	281	3	0.2
24,5	eShop	160	281	3	0.2
25	eShop	160	281	3	0.25
25,5	eShop	165	286	3	0.25
26	eShop	165	286	3	0.25
26,5	eShop	165	286	3	0.25
27	eShop	170	291	3	0.25
28	eShop	170	291	3	0.25
29,5	eShop	175	296	3	0.25
30	eShop	175	296	3	0.25
30,5	(eShop)	180	301	3	0.25
32	eShop	185	334	4	0.25
33	(eShop)	185	334	4	0.25
35	eShop	190	339	4	0.25

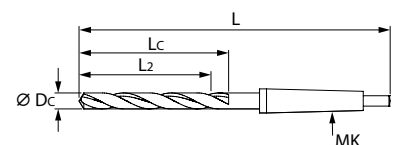


Garant Short jobber drills with Morse taper shank, for difficult to machine materials

Particularly sturdy due to extra short drilling section and partly with larger MT. Strengthened core.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	HARDOX 500 1600 N	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
11 6380							10	8					5			5						

Ø D _c h8	TTC 11 6380 Jobber drill HSS-E for Hardox	L _c	L	MT	f mm/rev.
mm	H	mm	mm		
8,5	eShop	43	124	1	0.08
10	eShop	50	131	1	0.08
10,5	eShop	50	131	1	0.08
12	eShop	59	157	2	0.12
13	eShop	59	157	2	0.12
14	eShop	63	161	2	0.12
17	eShop	73	171	2	0.14
17,5	eShop	77	175	2	0.14

Ø D _c h8	TTC 11 6380 Jobber drill HSS-E for Hardox	L _c	L	MT	f mm/rev.
mm	H	mm	mm		
18	eShop	77	175	2	0.14
20	eShop	83	204	3	0.14
21	eShop	87	208	3	0.14
22	eShop	90	211	3	0.14
25	eShop	98	219	3	0.18
26	eShop	103	224	3	0.18
30	eShop	112	261	4	0.18



11



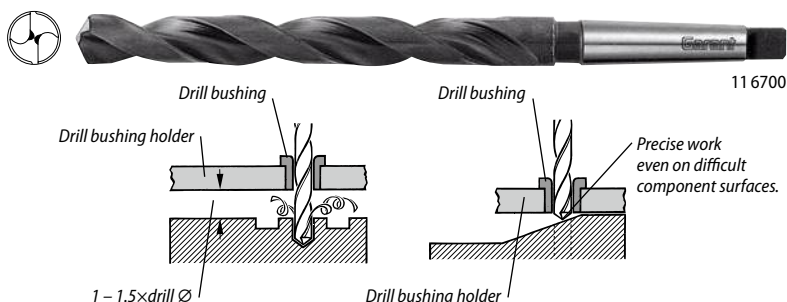
Garant Long jobber drills (bushing drill) with Morse taper shank

Compared to DIN 345 the flute length is longer by the drill bushing height. Thus the effective drilling depth is unaffected.
Special surface treatment for improved chip evacuation.

Advantage: For drilling through drill bushings in tool making, machine building and series production. Particularly important for drilling into uneven, inclined or arched surfaces.

Recommendation: Maximum drilling depth:

$$L_2 = L_r - 1.5 \times D_r.$$



Suitable for/ v_c [m/min]	Alu plastics 	Alu cast > 10% Si 												INOX	INOX	Ti	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N				
	11 6700			40	30	25											25						

Ø D _c h8	11C 11 6700 Jobber drill long HSS N	L _c	L	MT	
mm		mm	mm		mm/rev.
10	eShop	116	197	1	0.1
10,5	eShop	116	197	1	0.1
11	eShop	125	206	1	0.1
11,5	eShop	125	206	1	0.1
12	eShop	134	215	1	0.16
12,5	eShop	134	215	1	0.16
13	eShop	134	215	1	0.16
13,5	eShop	142	223	1	0.16
14	eShop	142	223	1	0.16
14,5	eShop	147	245	2	0.16
15	eShop	147	245	2	0.16
15,5	eShop	153	251	2	0.16
16	eShop	153	251	2	0.16

Ø D _c h8	11C 11 6700 Jobber drill long HSS	L _t	L	MT	 < 750 N f
mm	N	mm	mm		mm/rev.
16,5	eShop	159	257	2	0.2
17	eShop	159	257	2	0.2
17,5	eShop	165	263	2	0.2
18	eShop	165	263	2	0.2
18,5	eShop	171	269	2	0.2
19	eShop	171	269	2	0.2
19,5	eShop	177	275	2	0.2
20	eShop	177	275	2	0.2
20,5	eShop	184	282	2	0.2
21	eShop	184	282	2	0.2
22	eShop	191	289	2	0.2
22,5	(eShop)	198	296	2	0.2
23	eShop	198	296	2	0.2

Ø D _c h8	11 6700 Jobber drill long HSS N	L _c	L	MT	 < 750 N f
mm		mm	mm		mm/rev
24	eShop	206	327	3	0.2
25	eShop	206	327	3	0.25
26	eShop	214	335	3	0.25
27	eShop	222	343	3	0.25
28	eShop	222	343	3	0.25
30	eShop	230	351	3	0.25
31	eShop	239	360	3	0.25
32	eShop	248	397	4	0.25
33	eShop	248	397	4	0.25
35	eShop	257	406	4	0.25
40	eShop	277	426	4	0.32
45	(eShop)	298	447	4	0.32
50	eShop	321	470	4	0.32



Garant Extra long jobber drills with Morse taper shank

High concentricity.

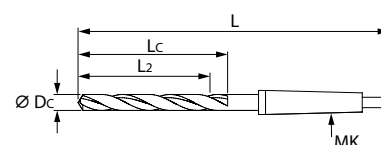
Large section parabolic flutes; strong due to strengthened core thickness (without core taper).

≤ 16 mm Ø: Bright finish flutes, nitrided lands; > 16 mm Ø: Specially treated surface.

Special sturdy drills **for extremely deep holes**. Up to approx. 15xØ without drill withdrawal.

Recommendation: Maximum drilling depth:

$$L_3 = L_c - 1.5 \times D_c.$$

[illegible]

Ø D _c h8	11C 11 6720 Jobber drill extra long HSS	L _c	L	MT	 < 750 N f
mm	FS	mm	mm		mm/rev.
10R1	eShop	185	285	1	0.1
10R2	eShop	235	360	1	0.1
10,5R2	eShop	235	360	1	0.1
11R1	eShop	195	300	1	0.1
11R2	eShop	250	375	1	0.1
11,5R2	eShop	250	375	1	0.1
12R1	eShop	205	310	1	0.16
12R2	eShop	260	395	1	0.16
12,5R2	eShop	260	395	1	0.16
13R1	eShop	205	310	1	0.16
13R2	eShop	260	395	1	0.16
13,5R2	eShop	275	410	1	0.16

Ø D _c h8	11C 11 6720 Jobber drill extra long HSS	L _c	L	MT	 < 750 N f
mm	FS	mm	mm		mm/rev
14R1	eShop	220	325	1	0.16
14R2	eShop	275	410	1	0.16
15R1	eShop	220	340	2	0.16
15R2	eShop	275	425	2	0.16
16R1	eShop	230	355	2	0.2
16R2	eShop	295	445	2	0.2
17R1	eShop	220	355	2	0.2
17,5R2	eShop	310	465	2	0.2
18R1	eShop	245	370	2	0.2
18R2	(eShop)	310	465	2	0.2
19R1	eShop	245	370	2	0.2
20R1	eShop	260	385	2	0.2

Ø D _c h8	11C 11 6720 Jobber drill extra long HSS	L _c	L	MT	
mm	FS	mm	mm		mm/rev
20R2	eShop	325	490	2	0.2
21R1	eShop	260	385	2	0.2
21R2	(eShop)	325	490	2	0.2
22R1	eShop	270	405	2	0.2
24R1	eShop	290	440	3	0.2
24R2	(eShop)	365	555	3	0.2
25R1	eShop	290	440	3	0.25
25R2	(eShop)	365	555	3	0.25
26R1	eShop	290	440	3	0.25
26R2	eShop	365	555	3	0.25
28R1	(eShop)	305	460	3	0.25
30R1	(eShop)	305	460	3	0.25



DIN 1870R1
DIN 1870R2

Garant Extra long jobber drills with Morse taper shank

High concentricity. Core thickness and core taper are standard.

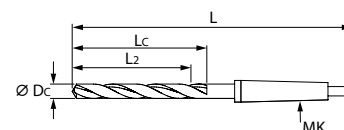
Special surface treatment.

Precision ground point. When drilling deep holes, evacuate chips from the hole frequently, and ensure adequate cooling.

Economy version with standard flutes.

Recommendation: Maximum drilling depth:

$$L_2 = L_c - 1.5 \times D_c$$



11 6760

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX	INOX	Ti	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 6760				40	30	25											25						

Ø D _c h8	TTC	11 6760	L _c	L	MT	f
		Jobber drill extra long HSS				
mm		N	mm	mm		mm/rev.
8R1		eShop	165	265	1	0.1
9R1		(eShop)	175	275	1	0.1
9R2		(eShop)	220	345	1	0.1
10R1		eShop	185	285	1	0.1
10R2		(eShop)	235	360	1	0.1
10,5R2		eShop	235	360	1	0.1
11R1		eShop	195	300	1	0.1
11R2		eShop	250	375	1	0.1
11,5R2		eShop	250	375	1	0.1
12R1		eShop	205	310	1	0.16
12R2		eShop	260	395	1	0.16
12,5R2		eShop	260	395	1	0.16
13R1		eShop	205	310	1	0.16
13R2		eShop	260	395	1	0.16
13,5R2		eShop	275	410	1	0.16
14R1		eShop	220	325	1	0.16
14R2		eShop	275	410	1	0.16
14,5R2		eShop	275	425	2	0.16
15R1		eShop	220	340	2	0.16
15R2		eShop	275	425	2	0.16

Ø D _c h8	TTC	11 6760	L _c	L	MT	f
		Jobber drill extra long HSS				
mm		N	mm	mm		mm/rev.
15,5R2		eShop	295	445	2	0.16
16R1		eShop	230	355	2	0.2
16R2		eShop	295	445	2	0.2
16,5R2		eShop	295	445	2	0.2
17R1		eShop	230	355	2	0.2
17R2		eShop	295	445	2	0.2
17,5R2		eShop	310	465	2	0.2
18R1		eShop	245	370	2	0.2
18R2		eShop	310	465	2	0.2
19R1		eShop	245	370	2	0.2
20R1		eShop	260	385	2	0.2
20R2		eShop	325	490	2	0.2
21R1		eShop	260	385	2	0.2
22R1		eShop	270	405	2	0.2
22R2		eShop	345	515	2	0.2
23R1		(eShop)	270	405	2	0.2
24R1		eShop	290	440	3	0.2
26R1		eShop	290	440	3	0.25
30R1		(eShop)	305	460	3	0.25
30R2		eShop	385	580	3	0.25



Garant Stub stepped drills for tapping holes, 90° countersink

Very sturdy. Tight concentricity tolerances between drill Ø and counterbore Ø guarantee exact alignment.

11 7020 – Special surface treatment, resulting in reduced tendency to edge build-up and improved chip evacuation.

Advantage: Hole and countersink are produced in one operation and precisely aligned.

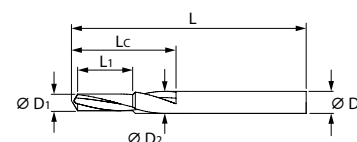
Application: Particularly suitable for NC machines due to high positional accuracy, excellent centring properties and great sturdiness. The preceding centring operation can thus often be omitted. For thread tapping drill holes to DIN 336 sheet 1 with 90° countersink. In the following operation, the tap therefore does not have to cut into the sharp edge of the hole.



11 7020



11 7040



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX	INOX	Ti	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 7020		45	40	30	25												25	80					
11 7040		56	50	50	37	31	12	10									31	80					

for threads	TTC	11 7020	TTC	11 7040	Ø D ₁ h8	Ø D ₂ h8	L ₁	L _c	L	Ø D _s	f
		Stub stepped drill HSS									
		90°									
		vaporised		TiAlN							
M3		eShop		eShop	2.5	3.4	8.8	20	52	3.4	0.03
M4		eShop		eShop	3.3	4.5	11.4	24	58	4.5	0.03
M5		eShop		eShop	4.2	5.5	13.6	28	66	5.5	0.07
M6		eShop		eShop	5	6.6	16.5	31	70	6.6	0.07
M8		eShop		eShop	6.8	9	21	40	84	9	0.1
M10		eShop		eShop	8.5	11	25.5	47	95	11	0.1
M12		eShop		eShop	10.2	13.5	30	54	107	13.5	0.16

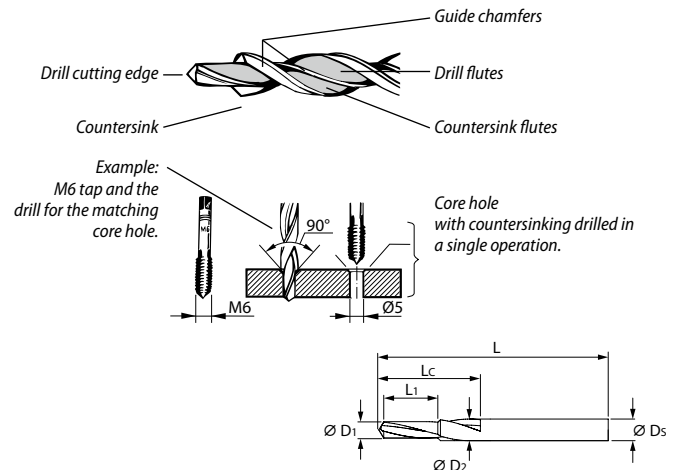


Garant Subland drill for tapping holes, 90° countersink

11 7060

Drill and counterbore each with its own chip flutes and guide chamfers.
This means the profile of the stepped drill is retained even after repeated regrinding.

Application: Tapping hole and countersink are produced in one operation, precisely aligned.
For drilling tapping holes to DIN 336 sheet 1 with 90° countersinking (similar to DIN 69, medium version).



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast	> 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 7060		45		40	30	25												25	80					

for threads	TTC	11 7060	Ø D ₁ h9	Ø D ₂ h8	L ₁	L _c	L	Ø D _s	f
		Subland drill HSS 90° vaporised	mm	mm	mm	mm	mm	mm	mm/rev.
M3		eShop	2.5	3.4	8.8	39	70	3.4	0.03
M4		eShop	3.3	4.5	11.4	47	80	4.5	0.03
M5		eShop	4.2	5.5	13.6	57	93	5.5	0.07
M6		eShop	5	6.6	16.5	63	101	6.6	0.07
M8		eShop	6.8	9	21	81	125	9	0.1
M10		eShop	8.5	11	25.5	94	142	11	0.1
M12		eShop	10.2	13.5	30	108	160	13.5	0.16



Garant Stub subland drill for through holes, 90° (for countersunk screws)

11 7120

Very sturdy. Tight concentricity tolerances between drill Ø and counterbore Ø guarantee exact alignment.

11 7120 – Special surface treatment, resulting in reduced tendency to edge build-up and improved chip evacuation.

Application: Particularly suitable for NC machines due to high positional accuracy, excellent centring properties and great sturdiness. The preceding centring operation can thus often be omitted.
For through holes for screws to DIN-ISO 273 and countersinks to DIN 74, sheet 1 form A, fine version.
For screws to ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965 and 966).



11 7140

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast	> 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 7120		45		40	30	25												25	80					
11 7140		56	50	50	37	31	12	10										31	80					

for screws	TTC	11 7120	TTC	11 7140	Ø D ₁ h8	Ø D ₂ h8	L ₁	L _c	L	Ø D _s	f
		Stub subland drill HSS 90° vaporised		TiAlN	mm	mm	mm	mm	mm	mm	mm/rev.
M3		eShop		eShop	3.2	6	9	28	66	6	0.03
M4		eShop		eShop	4.3	8	11	37	79	8	0.03
M5		eShop		eShop	5.3	10	13	43	89	10	0.07
M6		eShop		eShop	6.4	11.5	15	47	95	11.5	0.07
M8		eShop		eShop	8.4	15	19	56	111	15	0.1
M10		eShop		eShop	10.5	19	23	64	127	19	0.1



Garant Stub subland drill for through holes, 90° (for countersunk screws)

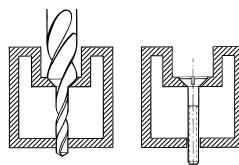
With long drilling step.

Application: For through holes for screws to DIN-ISO 273 and countersinks to DIN 74, sheet 1 form A, medium version.
For screws to ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965 and 966).

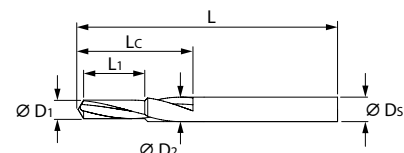
Especially suitable for holes with simultaneous countersinking in the profile material.



11 7160



Through hole with counterbore for screw head drilled in a single operation.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 7160	70	45		40	30	25											25	80	●	●			

for screws	11 7160	$\varnothing D_1 \pm 0.05$	$\varnothing D_2 h9$	L_1	L_c	L	$\varnothing D_s$	f
	Subland drill HSS-E with long drilling step 90°	mm	mm	mm	mm	mm	mm	mm/rev.
M4	eShop	4.3	8.6	30	55	110	8.6	0.03
M5	eShop	5.3	10.4	30	55	110	10.4	0.07
M6	eShop	6.4	12.4	30	55	110	12.4	0.07
M8	eShop	8.4	16.4	30	70	110	12.5	0.1
M10	eShop	10.5	20.4	30	70	110	12.5	0.1



Garant Subland drill for through holes, 90° (for countersunk screws)

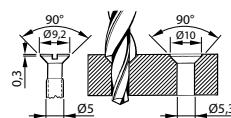
Drill and counterbore each with its own chip flutes and guide chamfers.

This means it can be reground many times.

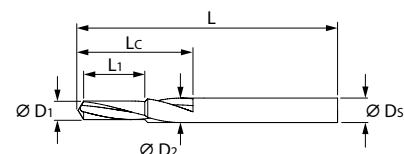
Application: For through holes for screws to DIN-ISO 273 and countersinks to DIN 74, sheet 1 form A, fine version.
For countersunk screws to ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965 and 966).



11 7180



Example:
M5 countersunk screw and the appropriate subland drill No. 11 7180_M5.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 												INOX	INOX	Ti	GG(G)	CuZn						
	ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
	11 7180	45		40	30	25											25	80						

for screws	11 7180	$\varnothing D_1 h9$	$\varnothing D_2 h8$	L_1	L_c	L	$\varnothing D_s$	f
	Subland drill HSS 90° vaporised	mm	mm	mm	mm	mm	mm	mm/rev.
M3	eShop	3.2	6	9	57	93	6	0.03
M4	eShop	4.3	8	11	75	117	8	0.03
M5	eShop	5.3	10	13	87	133	10	0.07
M6	eShop	6.4	11.5	15	94	142	11.5	0.07
M8	eShop	8.4	15	19	114	169	15	0.1
M10	eShop	10.5	19	23	135	198	19	0.1



11 7240



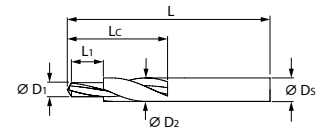
11 7260

Garant Stub subland drills for through holes, 180° (for socket-head screws)

Very sturdy. Tight concentricity tolerances between drill $\varnothing$ and counterbore $\varnothing$ guarantee exact alignment.

11 7240 – Special surface treatment, resulting in reduced tendency to edge build-up and improved chip evacuation.

Application: For through holes for screws to DIN-ISO 273 and countersinking to DIN 74, sheet 2 form H, J and K, medium version.
For screws to DIN 912, 6912 and 7984, ISO 1207 (DIN 84).



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si													GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N			
11 7240		45		40	30	25											25	80			
11 7260		56	50	50	37	31	12	10									31	80			

for screws	11C	11 7240	11C	11 7260	$\varnothing D_1$ h8	$\varnothing D_2$ h8	L_1	L_c	L	$\varnothing D_3$	
		Stub subland drill HSS									
		180°									
		vaporised		TiAlN	mm	mm	mm	mm	mm	mm	mm/rev.
M3		eShop		eShop	3.4	6	9	28	66	6	0.03
M4		eShop		eShop	4.5	8	11	37	79	8	0.03
M5		eShop		eShop	5.5	10	13	43	89	10	0.07
M6		eShop		eShop	6.6	11	15	47	95	11	0.07
M8		eShop		eShop	9	15	19	56	111	15	0.1
M10		eShop		eShop	11	18	23	62	123	18	0.1



Garant Subland drill for through holes, 180° (for socket-head screws)

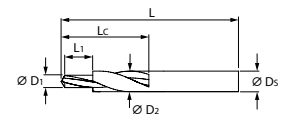
Drill and counterbore each with its own chip flutes and guide chamfers.

This means the profile of the stepped drill is retained even after repeated regrinding.

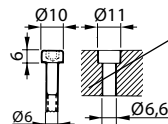
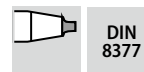
Application: For screw through holes to DIN-ISO 273 and screw head counterbores shape H, J, and K. Medium version to DIN 74 sheet 2.



11 7280



11 7320



Example:
Hole and counterbore for hexagon socket screws M6 DIN 912 and matching subland drill No. 11 7280_M6.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si													GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N			
11 7280/7320		45		40	30	25											25	80			

for screws	11C	11 7280	Ø D ₁ h9	Ø D ₂ h8	L ₁	L _c	L	Ø D _s	 < 750 N f
		Subland drill HSS							
		180°							
		vaporised	mm	mm	mm	mm	mm	mm	mm/rev.
M3		eShop	3.4	6.5	9	63	101	6.5	0.03
M4		eShop	4.5	8	11	75	117	8	0.03
M5		eShop	5.5	10	13	87	133	10	0.07
M6		eShop	6.6	11	15	94	142	11	0.07
M8		eShop	9	15	19	114	169	15	0.1
M10		eShop	11	18	23	130	191	18	0.1

for screws	11C	11 7320	Ø D ₁ h9	Ø D ₂ h8	L ₁	L _c	L	MT	 < 750 N f
		Subland drill HSS							
		180°							
		vaporised	mm	mm	mm	mm	mm		mm/rev.
M5		eShop	5.5	10	13	87	168	1	0.07
M6		eShop	6.6	11	15	94	175	1	0.07
M8		eShop	9	15	19	114	212	2	0.1
M10		eShop	11	18	23	130	228	2	0.1
M12		eShop	13.5	20	27	140	238	2	0.16
M14		eShop	15.5	24	31	160	281	3	0.16
M16		eShop	17.5	26	35	165	286	3	0.2
M20		eShop	22	33	43	185	334	4	0.2

Garant Precision taper sheet and tube drill



With sharp drill point, pre-drilling not necessary.

Conically increasing cutting edges and radially relief ground circumference for a paring cut. With scale in the flutes. Three drive flats on the shank.

11 8030 – **TiN coating:** Higher cutting speeds and significantly longer tool life. Specially for soft materials with a tendency to smear.

11 8040 – **TiAlN coating for dry machining,** optimum tool life and highest cutting speeds. **Helical flutes** for reliable chip evacuation.

Application: Leaves no burr or chatter marks.
Sheet metal 0.1 – 2 mm,
stainless steel 0.1 – 1 mm,
non-ferrous metals: 0.1 – 5 mm,
plastics up to 10 mm.



11 8020



11 8030



11 8040

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 8020	○	○	○	●	●	●	●								○		●		○	○	○		
11 8030	○	○	○	●	●	●	●							●	○		●		○	○	○		
11 8040	○	○	○	●	●	●	●							●	○				○	○	○	●	

Cutter Ø D _c	mm	3-14	8-20	16-30,5	4-30,5	26-40	36-50	46-60
11 8020	Precision taper sheet and tube drill HSS	eShop	eShop	eShop	eShop	eShop	eShop	eShop
11 8030	Precision taper sheet and tube drill HSS TiN	eShop	eShop	eShop	eShop	eShop	eShop	eShop
11 8040	Precision taper sheet and tube drill with helical flute HSS TiAlN	eShop	eShop	eShop	eShop	—	—	—
Overall length	mm	58	62	71	102	83	95	96
Shank Ø	mm	6	8	10	10	12	13	13

Taper sheet and tube drill sets



With sharp drill point, pre-drilling not necessary.

Conically increasing cutting edges and radially relief ground circumference for a paring cut. With scale in the flutes. Three drive flats on the shank.

Set of 3 conical sheet and tube drills and 1 cutting compound No. 118160 in a case.

Application: Leaves no burr or chatter marks.
Sheet metal 0.1 – 2 mm,
stainless steel 0.1 – 1 mm,
non-ferrous metals: 0.1 – 5 mm,
plastics up to 10 mm.

Cutter Ø D _c	mm	3-30,5
11 8120	Precision taper sheet and tube drill set HSS	eShop
11 8130	Precision taper sheet and tube drill set HSS TiN	eShop
11 8140	Precision taper sheet and tube drill set with helical flute HSS TiAlN	eShop
Content:		
1x each taper sheet and tube drill (11 8120)	No. 118020 size 3 – 14; 8 – 20; 16 – 30.5	
1x each taper sheet and tube drill (11 8130)	No. 118030 size 3 – 14; 8 – 20; 16 – 30.5	
1x each taper sheet and tube drill (11 8140)	No. 118040 size 3 – 14; 8 – 20; 16 – 30.5	
Cutting compound	No. 118160	



11 8120



11 8130



11 8160

Cutting compound

11 8160	Cutting compound Ø 29 mm×91 mm	eShop
---------	--------------------------------	-------

Garant Stepped drill

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
11 8320				●	●	●								●			●		●	●		○	
11 8324				●	●	●								○					●	●		○	

Stepped drill



With cylindrical spotting drill, Ø figures shown in the flute. Three drive flats on the shank.

Size PG – Combination stepped drill (core **and** through holes) **for conduit threads** (to DIN40430)
PG7; PG8; PG11; PG13,5; PG16; PG21

Size MF – Size MF combination stepped drill (core holes **and** through holes) **for metric fine threads**
(to DIN 60423) M12×1.5; M16×1.5; M20×1.5; M25×1.5; M32×1.5; M40×1.5

11 8324 – Stepped drill with spiral flutes for optimum chip evacuation and high-performance coating for high wear resistance.

Application: Drilling and deburring, maximum material thickness = step height (see table).

HSS E



11 8320_4-20

HSS E



11 8320_PG

HSS



11 8324_4-20

Cutter Ø		mm	4-12	4-20	6-30	9-36	12-20	20-30	30-40	40-50	50-60	PG	MF
TiC 11 8320	Stepped drill HSS-E		eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
TiC 11 8324	Stepped drill HSS	TiAlN	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	–	eShop	eShop
Step height		mm	6	4	4	4	4	4	5	5	5	4	4
Overall length		mm	79	70	100	85	75	88	98	112	119	93	94
Shank Ø		mm	6	9	10	12	9	12	13	13	13	12	12
Drill steps in increments of		mm	1	2	2	3	1	1	1	1	1	–	–

Stepped drill set



Set of 3 stepped drills and 1 cutting compound No. 11 8160 in a case.

Application: Drilling and deburring of plain holes in material up to 4 / 6 mm strength.

HSS E



11 8330

Cutter Ø D _c		mm	4-30
TiC 11 8330	Stepped drill set HSS-E		eShop
TiC 11 8332	Stepped drill set HSS	TiAlN	eShop
Drill steps in increments of		mm	1
Content:			
1× each stepped drill (11 8330)			No. 11 8320 size 4 – 12; 12 – 20; 20 – 30
1× each stepped drill (11 8332)			No. 11 8324 size 4 – 12; 12 – 20; 20 – 30
Cutting compound			No. 11 8160



11 8340

Case

11B 11 8340 Empty case for 3 stepped drills

eShop



Carbide hole saw plain shank

Extremely strong and with perfect concentricity due to **drill crown and shank of one piece** (hardened).
Narrow carbide cutting edges with **positive rake** and **large clearance angle** provide good cutting performance at low cutting pressure.

Exchangeable centre drill, shank with 3 clamping faces.

11 8400 – Dimension L: **size ≤ 55 = 35 mm / size 60 = 60 mm.**

11 8500 – Dimension L: **all sizes = 8 mm.**

11 8505 – Cutting width 1.9 mm for all sizes. Ø tolerance: **+ 0.15 / – 0.05 mm.**

Dimension L: **all sizes = 11.8 mm.**

11 8400/8500 – Cutting width 2 mm for all sizes. Ø tolerance: **+ 0.10 / – 0.05 mm.**

Application: For use on stationary machines. Suitable for fibre-reinforced plastics (GRP and CRP).

11 8400 – For flat material up to 4 mm thickness, and pipes of up to 4 mm wall thickness.

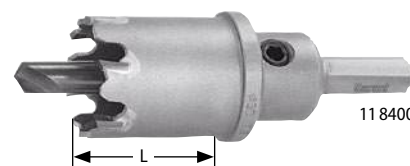
11 8500 – Only for flat material up to 4 mm thickness.

11 8505 – Only for flat material up to 5 mm thickness.

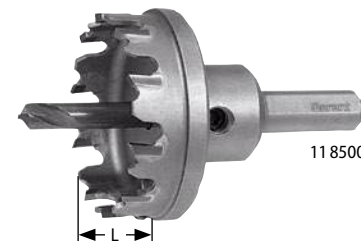
Carbide



11 8400
11 8500



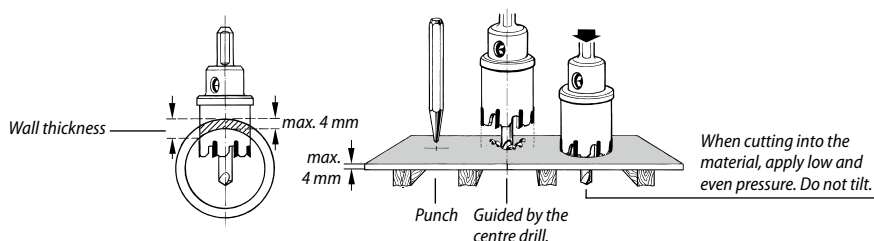
11 8400



11 8500



11 8505



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	500 N	750 N	900 N	1100 N	1400 N	55 HRC	60 HRC	65 HRC	67 HRC	70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	80	●	○	●	○	○
11 8400–11 8505																							

Ø D _c	11C 11 8400	11C 11 8500	12C 11 8505	Shank Ø		Ø D _c	11C 11 8400	11C 11 8500	12C 11 8505	Shank Ø	
	Garant			HOLEX			Garant			HOLEX	
	Carbide hole saw			Carbide hole saw			Carbide hole saw			Carbide hole saw	
mm	high	flat	flat	11 8400 11 8500	mm	mm	high	flat	flat	11 8400 11 8500	mm
16	eShop	eShop	eShop	6	10	44	eShop	eShop	eShop	10	10
17	eShop	eShop	eShop	6	10	45	eShop	eShop	eShop	10	10
18	eShop	eShop	eShop	6	10	46	eShop	eShop	eShop	10	10
19	eShop	eShop	eShop	6	10	47	–	eShop	–	10	–
20	eShop	eShop	eShop	6	10	48	eShop	eShop	eShop	10	10
21	eShop	eShop	eShop	6	10	49	eShop	eShop	eShop	10	10
22	eShop	eShop	eShop	6	10	50	eShop	eShop	eShop	10	10
23	eShop	eShop	eShop	10	10	51	–	eShop	–	10	–
24	eShop	eShop	eShop	10	10	52	eShop	eShop	eShop	10	10
25	eShop	eShop	eShop	10	10	53	–	eShop	–	10	–
26	eShop	eShop	eShop	10	10	54	–	eShop	–	10	–
27	eShop	eShop	eShop	10	10	55	eShop	eShop	eShop	10	10
28	eShop	eShop	eShop	10	10	56	–	eShop	–	10	–
29	eShop	eShop	eShop	10	10	58	–	eShop	–	10	–
30	eShop	eShop	eShop	10	10	60	eShop	eShop	eShop	13	10
31	eShop	eShop	eShop	10	10	65	eShop	eShop	–	13	–
32	eShop	eShop	eShop	10	10	68	–	eShop	–	13	–
33	eShop	eShop	eShop	10	10	70	eShop	eShop	eShop	13	13
34	eShop	eShop	eShop	10	10	75	–	eShop	–	13	–
35	eShop	eShop	eShop	10	10	80	eShop	eShop	–	13	–
36	eShop	eShop	eShop	10	10	85	–	eShop	–	13	–
37	eShop	eShop	eShop	10	10	90	eShop	eShop	–	13	–
38	eShop	eShop	eShop	10	10	95	–	eShop	–	13	–
39	eShop	eShop	eShop	10	10	100	eShop	eShop	–	13	–
40	eShop	eShop	eShop	10	10	105	–	eShop	–	13	–
41	eShop	eShop	eShop	10	10	110	–	eShop	–	13	–
42	eShop	eShop	eShop	10	10	115	–	eShop	–	13	–
43	eShop	eShop	eShop	10	10	120	–	eShop	–	13	–

Spare centre drill

HSS
E

Ø×overall length	mm	6×69	8×69	8×94	6×48	8×48
11C 11 8450	Garant	Spare centre drill for hole saw No. 11 8400				
11C 11 8550		–	–	–	eShop	eShop
12C 11 8555	HOLEX	Spare centre drill for hole saw No. 11 8505				
for hole saw Ø (11 8450, 11 8550)	mm	16 – 22	23 – 55	60 – 100	16 – 58	60 – 120
for hole saw Ø (11 8555)	mm	–	–	–	16 – 70	–



11 8450



11 8550



11 8555

Core drill for magnetic core drilling machines 30, 35 and 55 mm cutting depth



Suitable for all popular magnetic core drilling machines. Very good cutting properties due to optimised cutting edge geometry. Easy to regrind. With Weldon shank - Ø 19 mm.

11 8782 – **Carbide with special TiAlN coating** – long tool life and outstanding cutting performance.

11 8792 – **HSS uncoated** – attractively priced alternative.

11 8802/8822 – **HSS with special TiAlN coating** for improved cutting characteristics (prevents edge build-up).

Application: On mobile magnetic drilling machines or stationary pillar drilling machines to produce large holes in steel construction. The core drill cuts only a thin material ring. The drilled core is ejected by a spring loaded ejector pin.

Supplied with: Without ejector pin.

Note: For the lubrication of core drills, we recommend high performance cutting oil (see No. 084210).



Core drilling machines
see No. 076520 – 076536
(Volume II / section 0).

Carbide



11 8782

HSS



11 8792

HSS



11 8802

HSS



11 8822

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
11 8782																							
11 8792																							
11 8802/8822																							

Ø D _c	11 8782	11 8792	11 8802	11 8822
	Garant		HOLEX	
	Carbide core drill		HSS core drill	
	Depth of cut 35 mm	Depth of cut 30 mm	Depth of cut 30 mm	Depth of cut 55 mm
mm	TiAlN		TiAlN	TiAlN
12	—	eShop	eShop	eShop
13	—	eShop	eShop	eShop
14	eShop	eShop	eShop	eShop
15	eShop	eShop	eShop	eShop
16	eShop	eShop	eShop	eShop
17	eShop	eShop	eShop	eShop
17,5	—	—	eShop	—
18	eShop	eShop	eShop	eShop
19	eShop	eShop	eShop	—
20	eShop	eShop	eShop	eShop
21	eShop	eShop	eShop	eShop
22	eShop	eShop	eShop	eShop
23	eShop	eShop	eShop	—
24	eShop	eShop	eShop	eShop

Ø D _c	11 8782	11 8792	11 8802	11 8822
	Garant		HOLEX	
	Carbide core drill		HSS core drill	
	Depth of cut 35 mm	Depth of cut 30 mm	Depth of cut 30 mm	Depth of cut 55 mm
mm	TiAlN		TiAlN	TiAlN
25	eShop	eShop	eShop	eShop
26	eShop	eShop	eShop	eShop
26,5	—	—	—	eShop
27	—	—	eShop	eShop
28	—	eShop	eShop	eShop
30	—	eShop	eShop	eShop
32	—	eShop	eShop	eShop
35	—	eShop	eShop	eShop
36	—	—	eShop	—
38	—	—	eShop	—
40	—	eShop	eShop	eShop
45	—	eShop	eShop	—
50	—	eShop	eShop	eShop

Ejector pins

Ø×Length	mm	6×77	6×90	6×103
11 8892	HOLEX Ejector pin	eShop	eShop	eShop
fits core drill No.		118792; 118802	118782	118822

MT arbors, adapters

11 8925 – Adapter with Weldon shank 19 mm Ø for BDS core drilling machines. Required when using FEIN carbide core drills No. 119000.

Suitable for:

11 8922 – Core drills with Weldon shank Ø 19 mm.

Application:

11 8922 – For mounting core drills in stationary drilling machines.

Type	2/19	3/19
11 8922	HOLEX MT arbor	eShop
MT	2	3
Shank Ø	mm	19
suitable for core drill Ø	mm	12 – 60
Cooling lubrication		manual



11 8892



11 8922



11 8925

03G 11 8925	Adapter for core drills (QuickIN)	eShop
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Carbide and HSS QuickIN core drills for FEIN core drilling machines

11 9000 – **High-performance carbide** core drill with QuickIN holder.
For maximum tool life and excellent metal removal rate.

Overall length: 77 mm for all cutter sizes.

11 9010 – **HSS** core drill with long tool life and QuickIN holder.

Overall length: 72 mm for all cutter sizes.

Suitable for: FEIN core drilling machines with QuickIN holder for fast, keyless tool changes.
Also suitable for other makes with adapter. The core drill cuts only a ring of material, saving approx. 40 % – 60 % cutting time.

Supplied with: **Without** centring pin.

Note: For FEIN core drilling machines see No. 076520/ 076524/ 076526 group 0 – workshop accessories.
The centring pin No. 119019 is required when using the core drills No. 119010 and 119000.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	Y < 500 N	Y < 750 N	Y < 900 N	Y < 1100 N	Y < 1400 N	Y < 55 HRC	Y < 60 HRC	Y < 65 HRC	Y < 67 HRC	Y < 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
11 9000	○	○	○	●	●	●	●	●						○	●	○	●	●	○	●	○	●	○
11 9010	○	●	○	○	○	○	○	○						○	○	○	○	○	○	○	○	○	○

Ø D _c	03G	11 9000	03G	11 9010
		Carbide core drill		HSS core drill
		Depth of cut 35 mm		Depth of cut 25 mm
mm				
12		eShop		eShop
13		eShop		eShop
14		eShop		eShop
15		eShop		eShop
16		eShop		eShop
17		eShop		eShop
18		eShop		eShop
19		—		eShop
20		eShop		eShop
21		eShop		eShop

Ø D _c	03G	11 9000	03G	11 9010
		Carbide core drill		HSS core drill
		Depth of cut 35 mm		Depth of cut 25 mm
mm				
22		eShop		eShop
23		—		eShop
24		eShop		eShop
25		eShop		eShop
26		eShop		eShop
28		eShop		eShop
30		eShop		eShop
32		eShop		eShop
35		eShop		—
36		eShop		—

Ø D _c	03G	11 9000	03G	11 9010
		Carbide core drill		HSS core drill
		Depth of cut 35 mm		Depth of cut 25 mm
mm				
38		eShop		—
40		eShop		—
43		eShop		—
45		eShop		—
50		eShop		—
52		eShop		—
55		eShop		—
60		eShop		—
62		eShop		—
65		eShop		—

Carbide core drill set

Carbide

Supplied with: 6 QuickIN core drills No. 119000 size 12 / 14 / 16 / 18 / 20 / 22 mm and 2 centring pins in plastic carrying case.

03G	11 9022	Carbide core drill set	eShop
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QuickIN MT arbors

Application:

11 9030 – For all FEIN core drills Ø 12 - 35 mm.

11 9035 – For all FEIN core drills Ø 12 - 65 mm.

11 9037 – Spare centring pin for QuickIN core drill No. 119000.

11 9030/9035 – **QuickIN arbor** for table and pillar drilling machines.
Including hand pump and centring pin for external coolant feed.

03G	11 9030	QuickIN arbor MT2	eShop
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03G	11 9035	QuickIN arbor MT3	eShop
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Length	mm	100
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03G	11 9037	Centring pin for 119000	eShop
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Adapter

Application:

11 9040 – Adapter **with QuickIN shank** for FEIN core drill units.

Accepts carbide and HSS core drills No. 118780 – 118820 (with Weldon shank 19 mm).

11 9042 – Spare centring pin for core drills when using adapter No. 119040.

03G	11 9040	Adapter for HSS core drill (Weldon)	eShop
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03G	11 9042	Centring pin	eShop
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11 9022



11 9030



11 9037



11 9040



11 9042

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Hoffmann Group

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Pick-up and delivery service, coating service, measurement certificate service, labelling service.

An all-round worry-free package has never been so easy – and with maximum cost transparency.

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Marin Engelsberger, Bacher GmbH



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<https://hog.tools/regrinding>



11

Garant

HOLEX

Overview – Solid carbide jobber drill range

Colour ring																		
																		
Brand	Garant		Garant		Garant		Garant		Garant		HOLEX		Garant		Garant		Garant	
Coating	DLC				DLC				TiAIN		TiAIN		TiAIN		TiAISIN		TiAISIN	
	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page
3xD																		
4xD without IC							12 1230	82	12 2361	91	12 2390	93						
4xD	12 2306	90									12 2490	94	12 2380	92	12 2480	95	12 2450	96
5xD without IC							12 1201	82										
5xD																		
6xD without IC									12 2641	113								
6xD	12 2602	111	12 2590	110	12 2595	110			12 2651	113	12 2685	116	12 2659	114	12 2680	117	12 2700	118
6xD pilot drill	12 2606	112																
8xD	12 2808	130											12 3008	131			12 3020	132
10xD													12 3110	137				
12xD	12 3178	138											12 3212	139				
16xD	12 3588	146																
20xD	12 3590	146																
20xD co-pilot drill																		
25xD	12 3593	146																
30xD	12 3595	146																
40xD																		
50xD																		
ISO 513																		
Aluminium, plastics	N	●	●		●		●				○		○				○	
Steel < 500 N/mm ²	P								○		●		●				●	
Steel < 900 N/mm ²	P								●		●		●				●	
Steel < 1400 N/mm ²	P								●		○		○				●	
Steel > 45 HRC	H								●								●	
INOX	M										●		●				●	
Titanium	S										○		○		●		●	
GG (G)	K								●		○		○				●	
CuZn	N	●	●		●						○						○	
Graphite, GRP, CRP	O	●																
UNI																	●	

	Centre drill				NC spotting drill 90°						NC spotting drill 142°						NC spotting drill 155°	
																		
Brand	Garant		Garant		Garant		Garant		Garant		Garant		Garant		Garant		Garant	
Coating			TiAIN						TiAIN						TiAIN		TiAIN	
	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page
Drills to DIN / manufacturer's standard	12 1000	78	12 1001	78	12 1019	78	12 1020	78	12 1040 12 1051	78	12 1068	79	12 1070	79	12 1110 12 1121	79	12 1130	81
ISO 513																		
Aluminium, plastics	N	●			○		○		●		○		○		●		●	
Steel < 500 N/mm ²	P	●	●		●		●		●		●		●		●		●	
Steel < 900 N/mm ²	P	●	●						●						●		●	
Steel < 1400 N/mm ²	P	●	●						○						○		○	
Steel > 45 HRC	H		●														●	
INOX	M	●	●						●						●		●	
Titanium	S								●								○	
GG (G)	K	●	●						●						●		●	
CuZn	N	●							●						●			
Graphite, GRP, CRP	O																	
UNI		●							●						●		●	

● = highly suitable; ○ = suitable only under restricted conditions



Colour ring													
Brand		HOLEX	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant
Coating		TiAIN	TiAIN	TiN	TiAIN	TiAIN	TiAIN	TiAIN	AlCrN	TiAIN	TiAIN	TiAIN	TiAIN
		No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page
3xD										12 2506	106		
4xD without IC		12 2501	103	12 2470	102	12 2415	97						
4xD		12 2504	106	12 2475	102	12 2425	98	12 2435	99				
5xD without IC													
5xD pilot drill										12 1223	84	12 2793	128
6xD without IC		12 2771	124									12 2540	109
6xD		12 2776	125	12 2761	123	12 2715	120	12 2725	121			12 2790	127
6xD pilot drill								12 2736	122				
8xD		12 3103	136	12 3040	135	12 3025	133	12 3035	134		12 1224	84	
10xD													
12xD		12 3303	143	12 3240	142	12 3225	140	12 3235	141		12 1226	85	
16xD													
20xD								12 3688	147	12 3888	149		
20xD co-pilot drill								12 3690	147	12 3890	149	12 1228	85
25xD								12 3691	148				
30xD								12 3693	147				
40xD								12 3695	147	12 3893	150	12 1231	86
50xD								12 3740	148	12 3895	150		
ISO 513								12 3750	148				
Aluminium, plastics		N	○						○		○		○
Steel < 500 N/mm ²		P	●	●	●	●	●	●	●	●	●	●	●
Steel < 900 N/mm ²		P	●	●	●	●	●	●	●	●	●	●	●
Steel < 1400 N/mm ²		P	●	●	●	●	●	●	●	●	○	○	○
Steel > 45 HRC		H	●	●	●	●	●	○	○	○	○	○	○
INOX		M	○	○	○	○	○	○	○	○	○	○	○
Titanium		S	●	●	●	●	●	○	○	○	○	○	○
GG (G)		K	●	●	●	●	●	●	●	●	○		●
CuZn		N										○	
Graphite, GRP, CRP		O											
UNI			●	●	●	●	●	●	●	●	●	●	●

		Drill, through shank						Carbide drill		Single-lip drills		Micro-drill		Stepped drill					
Brand		Garant	Garant	HOLEX	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant
Coating			TiAIN	TiN				TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN
		No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page	No.	Page
Drills to DIN / manufacturer's standard		12 2100 12 2250	88/89	12 2151 12 2251	88/89	12 2160 12 2301	88/89	12 1150	81	12 4002– 12 4010	152	12 1220	87	12 5035*	153	12 5050	154	12 5100	155
ISO 513																			
Aluminium, plastics		N	○	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
Steel < 500 N/mm ²		P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Steel < 900 N/mm ²		P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Steel < 1400 N/mm ²		P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Steel > 45 HRC		H	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
INOX		M	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Titanium		S	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
GG (G)		K	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○
CuZn		N	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○
Graphite, GRP, CRP		O		●	●	●	●												
UNI			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● = highly suitable; ○ = suitable only under restricted conditions

*configurable with 12 5040 – 12 5044

Solid carbide	DIN 333	Type A	k13	60°	h6
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Garant Solid carbide centre drill

12 1001 – Ground from solid carbide bar. Spiral fluted.

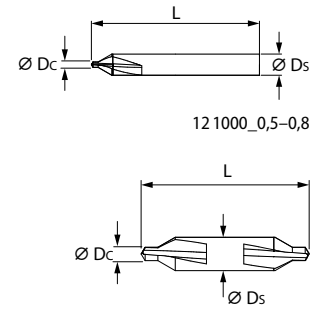
For materials up to **62 HRC**.

Size 0,5; 0,8 – Single-ended!



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
12 1000	200	180	160	80	75	65	50	35	60	40	20	15	35	30	25	70	160	●	●	●	○	○	○
12 1001																		●	●	●	○	○	○

Ø D _c k13	TIE	12 1000	TIE	12 1001	for workpiece Ø	Ø D _s	L	f
		Solid carbide centre drills						
		A						
mm		eShop		TiAlN	mm	mm	mm	mm/rev.
0,5		eShop		eShop	< 4	3.15	20	0.01
0,8		eShop		eShop	4 – 6	3.15	20	0.01
1		eShop		eShop	6 – 8	3.15	31.5	0.02
1,25		eShop		eShop	8 – 10	3.15	31.5	0.02
1,6		eShop		eShop	10 – 15	4	35.5	0.06
2		eShop		eShop	15 – 20	5	40	0.06
2,5		eShop		eShop	20 – 30	6.3	45	0.08
3,15		eShop		eShop	30 – 40	8	50	0.08
4		eShop		eShop	40 – 63	10	56	0.1
5		eShop		eShop	63 – 100	12.5	63	0.1
6,3		eShop		eShop	100 – 150	16	71	0.15



Solid carbide	Standard	h6	90°
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h6 DIN 6535 HA	h6 DIN 6535 HB
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Garant Solid carbide NC spotting drill

12 1019 – **Self-centring** with 1-cutter geometry, achieves **very high alignment accuracy**.

12 1051 – **Extra long version**.

12 1020–1051 – Exactly **central ground point**. **Easy spot drilling** and **high shape accuracy** of the centre hole. Sturdy due to short flutes.

12 1020/1040 – **≥ Ø 6 mm with HB drive flat**.

Application: Point angle **90°** for spot drilling and countersinking in one operation when a drill of smaller Ø is used afterwards.

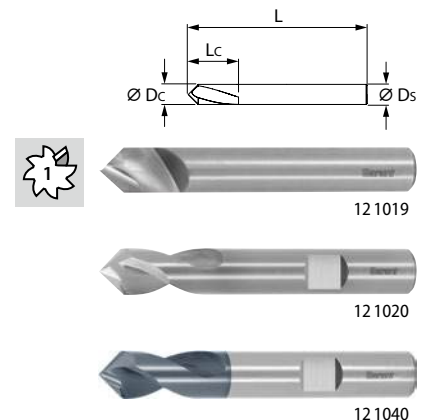
Note: Use the speed for the actual hole Ø (not generally the speed for the drill outer Ø).

12 1019 – **Maintain a feed rate f = 0.015 mm/rev!**

12 1051 – HB and HE shanks are available at the same price as HA. (from Ø 6 mm)

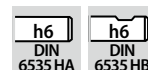
Form **HB**: order with **No. 121050**.

Form **HE**: order with **No. 121051 + 129100 HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
12 1019/1020	200	180	160	80	75	65	50	35	60	40	20	15	35	30	25	70	160	●	●	●	○	○	○
12 1040/1051	260	240	200	90	80	65	55						35	30	40	90	200	●	●	●	○	○	○

Ø D _c h6	TIE	12 1019	TIE	12 1020	TIE	12 1040	TIE	12 1051	L _c		L		Ø D _s	 f	
	Solid carbide NC precision spotting drill				Solid carbide NC spotting drill				12 1019	12 1020 12 1040 12 1051	12 1019 12 1020 12 1040	12 1051	12 1019	12 1020 12 1040 12 1051	
mm	90°				90° spiral flutes	90° spiral flutes	90° extra long spiral flutes						mm/rev.	mm/rev.	
					TiAlN	TiAlN			mm	mm	mm	mm	mm		
1	eShop				—	—	—		4	—	25	—	1	0.015	—
2	eShop				eShop	eShop	eShop		5	6	32	75	2	0.015	0.03
3	eShop				eShop	eShop	eShop		6	8	32	80	3	0.015	0.03
4	eShop				eShop	eShop	eShop		8	10	40	100	4	0.015	0.03
5	eShop				eShop	eShop	eShop		8	13	50	120	5	0.015	0.03
6	eShop				eShop	eShop	eShop		8	13	50	140	6	0.015	0.03
8	eShop				eShop	eShop	eShop		10	23	60	140	8	0.015	0.03
10	eShop				eShop	eShop	eShop		10	24	70	170	10	0.015	0.03
12	eShop				eShop	eShop	eShop		12	24	70	170	12	0.015	0.03
16	eShop				eShop	eShop	eShop		16	29	75	200	16	0.015	0.03
20	eShop				eShop	eShop	eShop		20	35	100	200	20	0.015	0.03



12 1068 – **Self-centring** with **1-cutter geometry**, achieves **very high alignment accuracy**.
 12 1121 – **Extra long version**.
 12 1070–1121 – Exactly **central ground point**. **Easy spot drilling** and **high shape accuracy** of the centre hole. Sturdy due to short flutes.
 12 1070/1110 – **≥ Ø 6 mm with HB drive flat**.

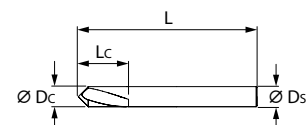
Note: Use speed for the actual hole Ø (not generally the speed for the drill outer Ø).

12 1068 – **Maintain a feed rate $f = 0.015$ mm/rev!**

12 1121 – Form HB and HE supplied at the same price as HA.

Form **HB**: order with **No. 121120**.

Form **HE**: order with **No. 121121 + 129100 HE**.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast %10 Si 									INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
12 1068/1070	200	180		80																		
12 1110/1121	260	240	200	90	80	65	55					35	30	40	90	200						

Ø D _c h6	11E 12 1068	11E 12 1070	11E 12 1110	11E 12 1121	L _c		L		Ø D _s	 f	
	Solid carbide NC precision spotting drill 142°	Solid carbide NC spotting drill			12 1068	12 1070 12 1110 12 1121	12 1068 12 1070 12 1110	12 1121		12 1068	12 1070 12 1110 12 1121
		142° spiral flutes	142° spiral flutes	142° extra long spiral flutes							
mm			TiAlN	TiAlN	mm	mm	mm	mm	mm	mm/rev.	mm/rev.
1	eShop	—	—	—	4	—	25	—	1	0.015	—
2	eShop	eShop	eShop	eShop	5	6	32	75	2	0.015	0.03
3	eShop	eShop	eShop	eShop	6	8	32	80	3	0.015	0.03
4	eShop	eShop	eShop	eShop	8	10	40	100	4	0.015	0.03
5	eShop	eShop	eShop	eShop	8	13	50	120	5	0.015	0.03
6	eShop	eShop	eShop	eShop	8	13	50	140	6	0.015	0.03
8	eShop	eShop	eShop	eShop	10	23	60	140	8	0.015	0.03
10	eShop	eShop	eShop	eShop	10	24	70	170	10	0.015	0.03
12	eShop	eShop	eShop	eShop	12	24	70	170	12	0.015	0.03
16	eShop	eShop	eShop	eShop	16	29	75	200	16	0.015	0.03
20	eShop	eShop	eShop	eShop	20	35	100	200	20	0.015	0.03

REAL MASTERS OF HIGH-FEED BORE MACHINING.

The GARANT Master Feed solid carbide drilling tools.

Garant MASTER STEEL FEED



12 2435 (page 99)



12 2725 (page 121)



12 3035 (page 134)



12 3235 (page 141)

Master Steel Feed NC spotting drill*
for maximum process reliability
12 1130 (page 81).

Master Steel Feed stepped drill
for tapping drill holes
12 5035 (page 153)
and configurable
12 5040 – 12 5044 (page 153).

Garant MASTER ALU FEED

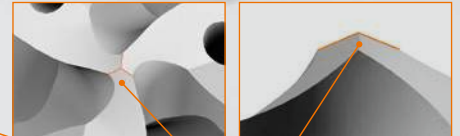


12 2590 (page 110)
uncoated.



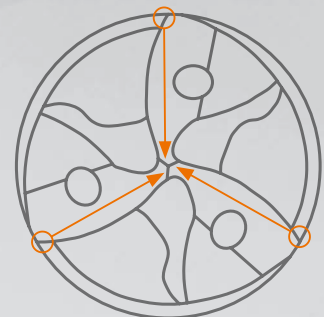
12 2595 (page 110)
with DLC coating.

- Optimal centring thanks to pyramid tip.
- No additional NC spot drilling is necessary.



- Robust tool design.
- Special cutting and chip groove geometry.
- Up to + 50% **metal removal rate** thanks to the third cutting edge.
- Maximum universality in the respective material segment.

Reliable self-centring
when engaging in the material.



* Only necessary for the GARANT Master Steel Feed.



Garant GARANT Master Steel Feed solid carbide NC spotting drill

3-flute NC spotting drill with high positioning accuracy and special point angle 155° for the GARANT Master Steel Feed drill. The **sector-leading technology of the drill point** guarantees **optimum self-centring behaviour** and permits spot drilling on irregular surfaces.

Note: Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 121130 + 129100 HB**.
Form **HE**: order with **No. 121130 + 129100 HE**.



Plain shank DIN 6535SHA

12 1130



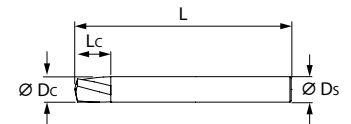
Weldon shank DIN 6535HB

12 1130 + 129100HB



Whistle-Notch shank DIN 6535HE

12 1130 + 129100HE



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si										INOX	INOX	Ti	GG	GGG	Uni								
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	K	K								
12 1130	260	220	200	120	110	100	90	70	60					55	50	40	120	80								

Ø D _c h6	12 1130	L _c	L	Ø D _s	Depth of spot facing	
	GARANT Master Steel Feed solid carbide NC spotting drill, plain shank					< 1100 N f
	155° DIN 6535 HA					
mm	TiAlN	mm	mm	mm	mm	mm/rev.
4	eShop	6	55	4	0.24 – 0.4	0.12
5	eShop	7	62	6	0.3 – 0.5	0.12
6	eShop	9	66	6	0.36 – 0.6	0.15
8	eShop	11	79	8	0.48 – 0.8	0.18
10	eShop	14	89	10	0.6 – 1	0.2
12	eShop	17	102	12	0.72 – 1.2	0.22
16	eShop	23	115	16	0.96 – 1.6	0.25
20	eShop	28	131	20	1.2 – 2	0.3



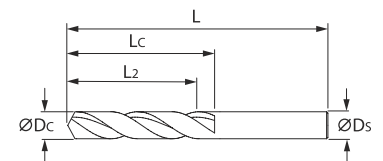
Garant Carbide tipped jobber drill plain shank

With carbide cutting tip. Ground between centres.
Shank with driver tang for use in clamping collets.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.



12 1150



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si										INOX	INOX	Ti	GG(G)	CuZn								
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N								
12 1150			140	70	70	60	40	25								90	140								

Ø D _c h8	12 1150	L ₂	L		Ø D _c h8	12 1150	L ₂	L	
	Carbide tipped jobber drill			< 1100 N f		Carbide tipped jobber drill			< 1100 N f
mm		mm	mm	mm/rev.	mm		mm	mm	mm/rev.
3	eShop	15.5	50	0.07	8	eShop	28	80	0.1
3,2	eShop	20.2	56	0.07	8,5	eShop	37.3	90	0.1
3,5	eShop	19.8	56	0.07	9	eShop	36.5	90	0.13
4	eShop	19	56	0.07	9,5	eShop	35.8	90	0.13
4,2	eShop	21.7	63	0.07	10	eShop	41	100	0.13
4,5	eShop	21.3	63	0.07	10,5	eShop	40.3	100	0.13
5	eShop	20.5	63	0.07	11	eShop	39.5	100	0.13
5,5	eShop	23.8	71	0.07	12	eShop	45	112	0.17
6	eShop	23	71	0.1	13	eShop	43.5	112	0.17
6,5	eShop	22.3	71	0.1	14	eShop	50	125	0.17
7	eShop	29.5	80	0.1	15	eShop	48.5	125	0.17
7,5	eShop	28.8	80	0.1	16	eShop	56	140	0.19



Garant Solid carbide special drill for plastics

Spiral flute precision drill for plastics. **Self-centring** with **1-cutter geometry**, achieves **very high alignment accuracy**. **Polished** helical flutes for **optimum chip evacuation**. Maintains the **tolerance band IT7** from entry $\varnothing$ through to exit $\varnothing$, **due to special point geometry**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and HE shanks are available at the same price as HA.
For **HB shanks**: use order **No. 121201 + 129100HB**.
For **HE shanks**: use order **No. 121201 + 129100HE**.



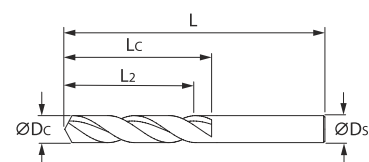
121201



Weldon shank DIN 6535HB 121201 + 129100HB



Whistle-Notch shank DIN 6535HE 121201 + 129100HE



Suitable for/ v_c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	CRP	Graphite GRP CRP				
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
121201	30	50	50	50	50		60	60	60	50	40	40										

$\varnothing D_c$ ± 0.003	TTE 121201	L_2	L	$\varnothing D_s$	PEEK
	Solid carbide special drill DIN 6535 HA	mm	mm	mm	mm/rev.
1	eShop	5.5	45	3	0.1
1,5	eShop	11.8	50	3	0.1
1,97	eShop	11.1	50	3	0.1
1,98	eShop	11.1	50	3	0.1
1,99	eShop	11.1	50	3	0.1
2	eShop	11	50	3	0.1
2,01	eShop	11	50	3	0.1
2,02	eShop	11	50	3	0.1
2,03	eShop	11	50	3	0.1
2,5	eShop	24.3	66	4	0.1
2,97	eShop	23.6	66	4	0.1
2,98	eShop	23.6	66	4	0.1

$\varnothing D_c$ ± 0.003	TTE 121201	L_2	L	$\varnothing D_s$	PEEK
	Solid carbide special drill DIN 6535 HA	mm	mm	mm	mm/rev.
2,99	eShop	23.6	66	4	0.1
3	eShop	23.5	66	4	0.1
3,01	eShop	23.5	66	4	0.1
3,02	eShop	23.5	66	4	0.1
3,03	eShop	23.5	66	4	0.1
4	eShop	30	74	4	0.15
4,01	eShop	30	74	4	0.15
4,02	eShop	30	74	4	0.15
4,03	eShop	30	74	4	0.15
5	eShop	36.5	82	6	0.15
5,01	eShop	36.5	82	6	0.15
5,02	eShop	36.5	82	6	0.15

$\varnothing D_c$ ± 0.003	TTE 121201	L_2	L	$\varnothing D_s$	PEEK
	Solid carbide special drill DIN 6535 HA	mm	mm	mm	mm/rev.
5,03	eShop	36.5	82	6	0.15
6	eShop	35	82	6	0.15
6,01	eShop	35	82	6	0.15
6,02	eShop	35	82	6	0.15
6,03	eShop	35	82	6	0.15
6,8	eShop	42.8	91	8	0.2
7	eShop	42.5	91	8	0.2
8	eShop	41	91	8	0.2
9	eShop	47.5	103	10	0.25
10	eShop	46	103	10	0.25



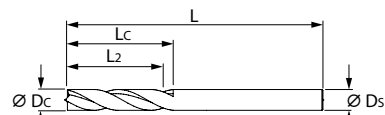
Garant Solid carbide drill for aramide

Special geometry for reliable drilling of aramide plastics (polyaramides) and aramide fibres as well as thermoplastics and thermosetting plastics.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.



121230



Suitable for/ v_c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	CRP	Graphite GRP CRP				
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
121230	140	130	120	100	110									120								

$\varnothing D_c$ h6	TTE 121230	L_2	L	$\varnothing D_s$	AFRP aramid
	Solid carbide drill for aramide	mm	mm	mm	mm/rev.
3	eShop	7.5	40	3	0.05
4	eShop	12	55	4	0.05
5	eShop	18.5	62	5	0.05
6	eShop	19	66	6	0.07
6,5	eShop	21.3	70	6.5	0.07
7	eShop	23.5	74	7	0.07

$\varnothing D_c$ h6	TTE 121230	L_2	L	$\varnothing D_s$	AFRP aramid
	Solid carbide drill for aramide	mm	mm	mm	mm/rev.
8	eShop	25	79	8	0.09
8,5	eShop	24.3	79	8.5	0.09
9	eShop	26.5	84	9	0.09
10	eShop	33	89	10	0.1
12	eShop	32	102	12	0.1

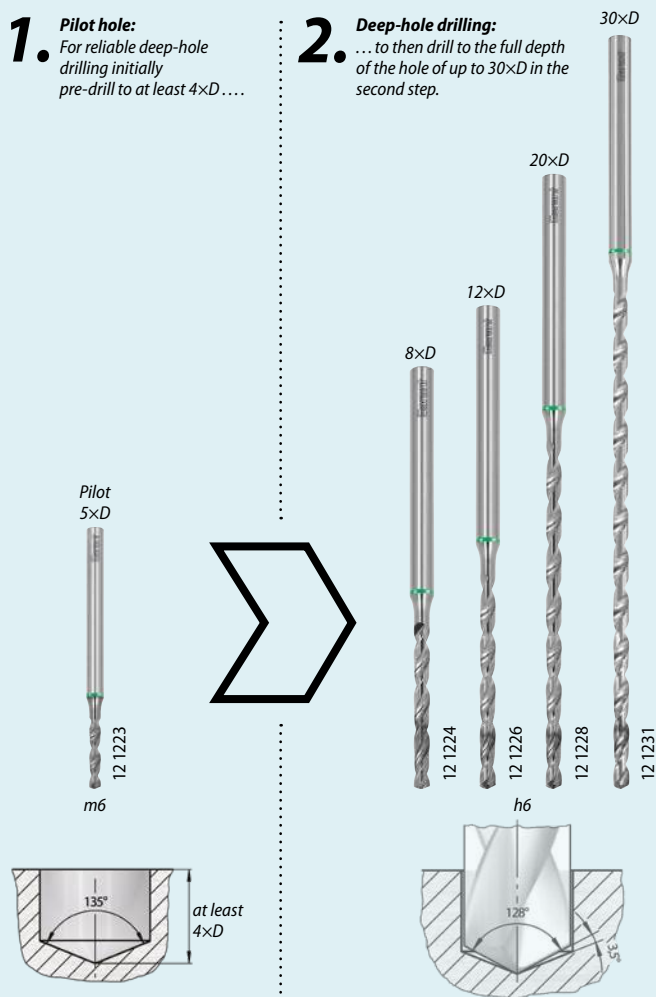
Technical precision at the highest level.

Process-reliable, general high-performance precision boring in the micro-range – up to a drilling depth of $30 \times D$.

Exactly matching tools within the overall system.

1. Pilot hole:
For reliable deep-hole drilling initially pre-drill to at least $4 \times D$

2. Deep-hole drilling:
...to then drill to the full depth of the hole of up to $30 \times D$ in the second step.



Central high-pressure cooling

Increased coolant hole cross-section in the shank area for increased flow of coolant and maximum extended range. Top flow speed and optimum cooling over the entire shank length for all versions and sizes.

Transition to helical coolant channel

Ultra-micrograin substrate with 10% cobalt proportion

Specially developed for micro-machining.

Lapped flute surface

For optimum chip evacuation.

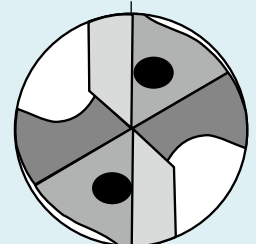
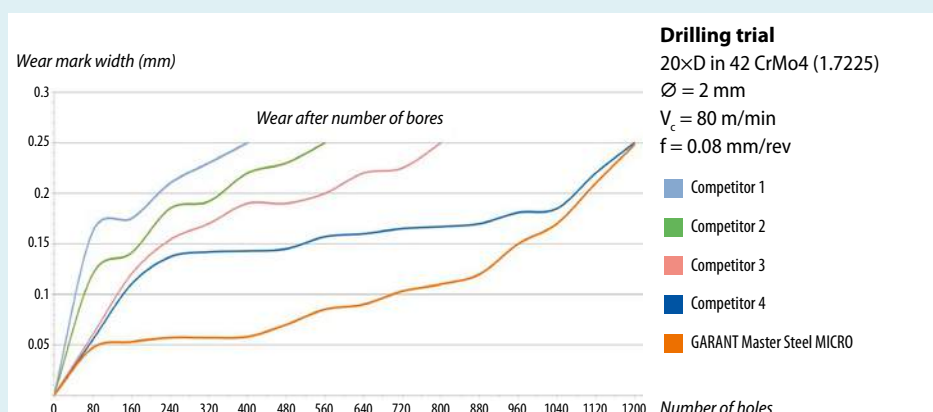
Diameter range
 $5 \times D$: 0.75 mm – 3.00 mm;
 $8 \times D$ – $30 \times D$: 0.80 mm – 3.00 mm

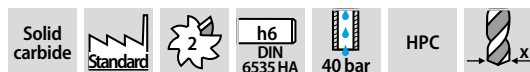
Wear-resistant and ultra-smooth AlCrN-based high-performance coating

Specially prepared and homogenised cutting edge for optimum chip shape

Very precise point geometry for reliable centring behaviour

Outstanding in steel and absolutely reliable UNI.





Garant GARANT Master Steel Micro solid carbide drill

High-performance micro-drill for general-purpose use on material, focussing on steel processing.

Maximum process reliability due to **exactly matched tools within the overall system** and **expanded guide chamfer**.

Drilling of very small diameters down to the maximum depth after creating a pilot hole.

Optimum compromise between core diameter and flute size for optimum chip evacuation – even with long-chipping materials.

The **increased metal removal rates and longer tool life** ensure an economical drilling process, even with very small hole diameters combined with a large L/D ratio.

Note:

For reliable use of the micro-drills from 8xD, a **pilot hole** of **at least 4xD** is required using the micro-pilot drill 121223.

For vertical machining and flat workpiece surfaces, a pilot hole can be dispensed with from $D_c = \varnothing 1 \text{ mm}$ up to a length of $12 \times D$.

Please always ensure that the **pilot hole is free from chips** before using the subsequent drilling tool.

We recommend setting a 90° counterbore with a suitable **NC spotting drill** after the pilot hole has been completed.

For critical applications (e.g. highest possible production accuracy, minimal burr formation, reduced coolant pressure), reduce the feed rate of the tool by 50% before entering and exiting the material.

Long-chipping materials may require **chips to be evacuated** in steps of $3 \times D$ each by moving the drill back slightly at pilot hole depth.

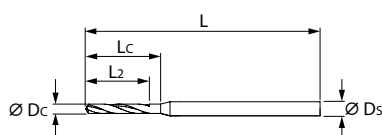
Please make sure that you use a suitable **tool clamping device** (shrink-fit chuck, hydraulic clamping chuck)

with a radial run-out of less than 0.003 mm, a sufficiently high **coolant pressure** (at least 30 bar),

as well as sufficiently fine **filtration** of the cooling medium ($D_c < \varnothing 2 \text{ mm}$ with filter $\leq 0.010 \text{ mm}$; $D_c < \varnothing 3 \text{ mm}$ filter $\leq 0.020 \text{ mm}$).

The specified L/D ratio gives the **minimum achievable depth of hole** with the respective micro-drill.

Flute length $L_c = L_2 + 1.5 \times D_c$.



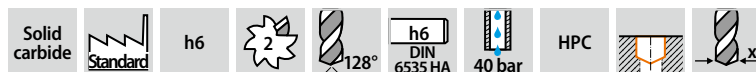
12 1223



12 1224

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
12 1223/1224	50	50		80	70	60	50						50	35	25	70	50						

Ø D _c	10F	12 1223	10F	12 1224	L ₂		L		Ø D _s	 f	 f
	GARANT Master Steel Micro solid carbide pilot drill, plain shank DIN 6535 HA 5xD		GARANT Master Steel Micro solid carbide drill, plain shank DIN 6535 HA 8xD		12 1223	12 1224	12 1223	12 1224	mm	mm/rev.	mm/rev.
	mm	AlCrN	AlCrN	AlCrN	mm	mm	mm	mm			
0,75	eShop	—	—	4.5	—	39	—	3	0.028	0.015	
0,8	eShop	eShop	eShop	4.4	6.8	39	41	3	0.028	0.015	
0,85	eShop	eShop	eShop	5	7.7	39	42	3	0.028	0.015	
0,9	eShop	eShop	eShop	5.6	7.6	39	42	3	0.028	0.015	
0,95	eShop	eShop	eShop	5.5	8.5	40	43	3	0.028	0.015	
1	eShop	eShop	eShop	5.5	8.5	41	43	3	0.028	0.015	
1,05	eShop	eShop	eShop	6.1	9.4	41	44	3	0.034	0.018	
1,1	eShop	eShop	eShop	6	9.3	41	44	3	0.034	0.018	
1,15	eShop	eShop	eShop	6.6	10.2	41	45	3	0.034	0.018	
1,2	eShop	eShop	eShop	6.6	10.2	41	45	3	0.034	0.018	
1,25	eShop	eShop	eShop	7.2	11.1	42	46	3	0.034	0.018	
1,3	eShop	eShop	eShop	7.1	11	42	46	3	0.045	0.024	
1,35	eShop	eShop	eShop	7.7	11.9	42	47	3	0.045	0.024	
1,4	eShop	eShop	eShop	7.7	11.9	42	47	3	0.045	0.024	
1,45	eShop	eShop	eShop	8.3	12.8	43	47	3	0.045	0.024	
1,5	eShop	eShop	eShop	8.2	12.7	43	47	3	0.045	0.024	
1,55	eShop	eShop	eShop	8.8	13.6	44	48	3	0.07	0.04	
1,6	eShop	eShop	eShop	8.8	13.6	44	48	3	0.07	0.04	
1,65	eShop	eShop	eShop	9.4	14.5	44	49	3	0.07	0.04	
1,7	eShop	eShop	eShop	9.3	14.4	44	49	3	0.07	0.04	
1,75	eShop	eShop	eShop	9.9	15.3	45	50	3	0.07	0.04	
1,8	eShop	eShop	eShop	9.9	15.3	45	50	3	0.07	0.04	
1,85	eShop	eShop	eShop	10.5	16.2	45	51	3	0.07	0.04	
1,9	eShop	eShop	eShop	10.4	16.1	45	51	3	0.07	0.04	
1,95	eShop	eShop	eShop	11	17	46	52	3	0.07	0.04	
2	eShop	eShop	eShop	11	17	46	52	3	0.07	0.04	
2,05	eShop	eShop	eShop	11.6	17.9	47	53	3	0.095	0.06	
2,1	eShop	eShop	eShop	11.5	17.8	47	53	3	0.095	0.06	
2,2	eShop	eShop	eShop	12.1	18.7	47	54	3	0.095	0.06	
2,3	eShop	eShop	eShop	12.6	19.5	48	55	3	0.095	0.06	
2,4	eShop	eShop	eShop	13.2	20.4	48	56	3	0.095	0.06	
2,5	eShop	eShop	eShop	13.7	21.2	49	56	3	0.095	0.06	
2,6	eShop	eShop	eShop	14.3	22.1	50	57	3	0.115	0.08	
2,7	eShop	eShop	eShop	14.8	22.9	50	58	3	0.115	0.08	
2,8	eShop	eShop	eShop	15.4	23.8	51	59	3	0.115	0.08	
2,9	eShop	eShop	eShop	15.9	24.6	51	60	3	0.115	0.08	
3	eShop	eShop	eShop	16.4	25.4	52	61	3	0.115	0.08	



Garant GARANT Master Steel Micro solid carbide drill

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For vertical machining and flat workpiece surfaces, a pilot hole can be dispensed with from $D_c = \varnothing 1 \text{ mm}$ up to a length of $12 \times D$.

Please always ensure that the **pilot hole is free from chips** before using the subsequent drilling tool.

We recommend setting a 90° counterbore with a suitable **tool clamping device** (shrink-fit chuck, hydraulic clamping chuck).

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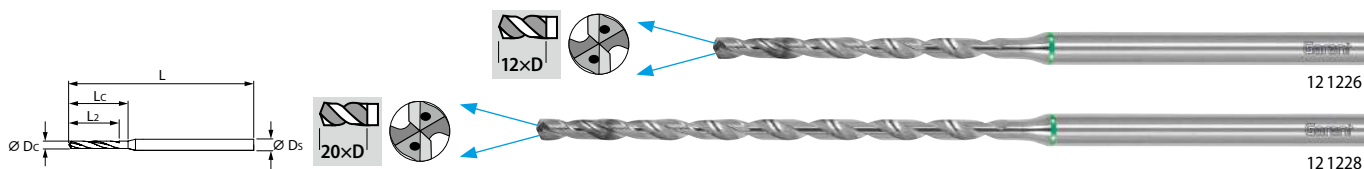
Please make sure that you use a suitable **tool clamping device** (shrink-fit chuck, hydraulic clamping chuck)

with a radial run-out of less than 0.003 mm, a sufficiently high **coolant pressure** (at least 30 bar),

as well as sufficiently fine **filtration** of the cooling medium ($D_c < \varnothing 2 \text{ mm}$ with filter $\leq 0.010 \text{ mm}$; $D_c < \varnothing 3 \text{ mm}$ filter $\leq 0.020 \text{ mm}$).

The specified L/D ratio gives the **minimum achievable depth of hole** with the respective micro-drill.

Flute length $L_c = L_2 + 1.5 \times D_c$.



Suitable for/ v_c [m/min]	Alu plastics 	Alu cast > 10% Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni						
ISO code	N	N	N	P	P	P	P	H	H	H	H	M	M	S	K	N							
12 1226		50	50		80	70	60	50				50	35	25	70	50	●	●	○				
12 1228		50	50		70	60	50	42				42	30	25	58	50	●	●					

$\varnothing D_c$ h6	12 1226	12 1228	L_2		L		$\varnothing D_s$		INOX
	GARANT Master Steel Micro solid carbide drill, plain shank								
	DIN 6535 HA 12xD	DIN 6535 HA 20xD	12 1226	12 1228	12 1226	12 1228			
mm	AlCrN	AlCrN	mm	mm	mm	mm	mm	mm/rev.	mm/rev.
0,8	eShop	eShop	10	16,4	44	51	3	0.028	0.015
0,85	eShop	eShop	11,3	18,5	46	53	3	0.028	0.015
0,9	eShop	eShop	11,2	18,4	46	53	3	0.028	0.015
0,95	eShop	eShop	12,5	20,5	47	55	3	0.028	0.015
1	eShop	eShop	12,5	20,5	47	55	3	0.028	0.015
1,05	eShop	eShop	13,8	22,6	48	57	3	0.034	0.018
1,1	eShop	eShop	13,7	22,5	48	57	3	0.034	0.018
1,15	eShop	eShop	15	24,6	50	59	3	0.034	0.018
1,2	eShop	eShop	15	24,6	50	59	3	0.034	0.018
1,25	eShop	eShop	16,3	26,7	51	61	3	0.034	0.018
1,3	eShop	eShop	16,2	26,6	51	61	3	0.045	0.024
1,35	eShop	eShop	17,5	28,7	52	63	3	0.045	0.024
1,4	eShop	eShop	17,5	28,7	52	63	3	0.045	0.024
1,45	eShop	eShop	18,8	30,8	53	66	3	0.045	0.024
1,5	eShop	eShop	18,7	30,7	53	66	3	0.045	0.024
1,55	eShop	eShop	20	32,8	55	68	3	0.07	0.04
1,6	eShop	eShop	20	32,8	55	68	3	0.07	0.04
1,65	eShop	eShop	21,3	34,9	56	70	3	0.07	0.04
1,7	eShop	eShop	21,2	34,8	56	70	3	0.07	0.04
1,75	eShop	eShop	22,5	36,9	57	72	3	0.07	0.04
1,8	eShop	eShop	22,5	36,9	57	72	3	0.07	0.04
1,85	eShop	eShop	23,8	39	59	74	3	0.07	0.04
1,9	eShop	eShop	23,7	38,9	59	74	3	0.07	0.04
1,95	eShop	eShop	25	41	60	76	3	0.07	0.04
2	eShop	eShop	25	41	60	76	3	0.07	0.04
2,05	eShop	eShop	26,3	43,1	61	78	3	0.095	0.06
2,1	eShop	eShop	26,2	43	61	78	3	0.095	0.06
2,2	eShop	eShop	27,5	45,1	63	80	3	0.095	0.06
2,3	eShop	eShop	28,7	47,1	64	82	3	0.095	0.06
2,4	eShop	eShop	30	49,2	65	85	3	0.095	0.06
2,5	eShop	eShop	31,2	51,2	67	87	3	0.095	0.06
2,6	eShop	eShop	32,5	53,3	68	89	3	0.115	0.08
2,7	eShop	eShop	33,7	55,3	69	91	3	0.115	0.08
2,8	eShop	eShop	35	57,4	70	93	3	0.115	0.08
2,9	eShop	eShop	36,2	59,4	72	95	3	0.115	0.08
3	eShop	eShop	37,4	61,3	73	97	3	0.115	0.08



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The specified L/D ratio gives the **minimum achievable depth of hole** with the respective micro-drill.

Flute length $L_c = L_2 + 1.5 \times D_c$.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si										INOX	INOX	Ti	GG(G)	CuZn						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
12 1231				60	50	45	40						35	30		50	40						

$\varnothing D_c$ h6	12 1231 GARANT Master Steel Micro solid carbide drill, plain shank DIN 6535 HA 30xD	L_2	L	$\varnothing D_s$	 f < 1100 N	INOX f < 900 N
mm	AlCrN	mm	mm	mm	mm/rev.	mm/rev.
0,8	eShop	24.4	59	3	0.028	0.015
0,85	eShop	27.5	62	3	0.028	0.015
0,9	eShop	27.5	62	3	0.028	0.015
0,95	eShop	30.6	65	3	0.028	0.015
1	eShop	30.5	65	3	0.028	0.015
1,05	eShop	33.6	68	3	0.034	0.018
1,1	eShop	33.6	68	3	0.034	0.018
1,15	eShop	36.7	71	3	0.034	0.018
1,2	eShop	36.6	71	3	0.034	0.018
1,25	eShop	39.7	74	3	0.034	0.018
1,3	eShop	39.7	74	3	0.045	0.024
1,35	eShop	42.8	78	3	0.045	0.024
1,4	eShop	42.7	78	3	0.045	0.024
1,45	eShop	45.8	81	3	0.045	0.024
1,5	eShop	45.8	81	3	0.045	0.024
1,55	eShop	48.9	84	3	0.07	0.04
1,6	eShop	48.8	84	3	0.07	0.04
1,65	eShop	51.9	87	3	0.07	0.04
1,7	eShop	51.9	87	3	0.07	0.04
1,75	eShop	55	90	3	0.07	0.04
1,8	eShop	54.9	90	3	0.07	0.04
1,85	eShop	58	93	3	0.07	0.04
1,9	eShop	58	93	3	0.07	0.04
1,95	eShop	61.1	96	3	0.07	0.04
2	eShop	61	96	3	0.07	0.04
2,05	eShop	64.1	99	3	0.095	0.06
2,1	eShop	64.1	99	3	0.095	0.06
2,2	eShop	67.1	102	3	0.095	0.06
2,3	eShop	70.2	106	3	0.095	0.06
2,4	eShop	73.2	109	3	0.095	0.06
2,5	eShop	76.3	112	3	0.095	0.06
2,6	eShop	79.3	115	3	0.115	0.08
2,7	eShop	82.3	118	3	0.115	0.08
2,8	eShop	85.4	121	3	0.115	0.08
2,9	eShop	88.5	124	3	0.115	0.08
3	eShop	91.5	127	3	0.115	0.08



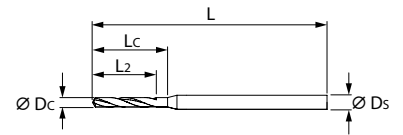
Garant Solid carbide micro drill HPC with shank Ø 3 h6

High performance miniature drill **with extra long flutes.**

Shank Ø 3 h6 for shrink-fit chucks.

High concentricity, precision ground for **HPC applications in steel.**

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	M	M	S	K	N						
12 1220	200	140	140	70	70	70	55	35	25			35	30	20	90	140	●	●	●	○		

Ø D _c +0.004	12 1220	L ₂	L	Ø D _s	f
	Solid carbide HPC micro-drill				< 1100 N
mm	TiAlN	mm	mm	mm	mm/rev.
0,1	eShop	1.1	38	3	0.01
0,15	eShop	1.8	38	3	0.01
0,2	eShop	3.2	38	3	0.01
0,25	eShop	3.2	38	3	0.01
0,3	eShop	5.1	38	3	0.01
0,35	eShop	5	38	3	0.01
0,4	eShop	6.4	38	3	0.01
0,45	eShop	6.4	38	3	0.01
0,5	eShop	6.3	38	3	0.02
0,55	eShop	6.2	38	3	0.02
0,6	eShop	6.1	38	3	0.02
0,65	eShop	6.1	38	3	0.02
0,7	eShop	9.5	38	3	0.02
0,75	eShop	9.4	38	3	0.02
0,8	eShop	9.3	38	3	0.02
0,85	eShop	9.3	38	3	0.03
0,9	eShop	9.2	38	3	0.03
0,95	eShop	9.1	38	3	0.03
0,97	eShop	9.1	38	3	0.03
0,98	eShop	9.1	38	3	0.03
0,99	eShop	9.1	38	3	0.03
1	eShop	9	38	3	0.03
1,01	eShop	9	38	3	0.03
1,02	eShop	9	38	3	0.03
1,03	eShop	9	38	3	0.03
1,05	eShop	9	38	3	0.03
1,1	eShop	8.9	38	3	0.03
1,15	eShop	8.8	38	3	0.03
1,2	eShop	8.7	38	3	0.03
1,25	eShop	8.7	38	3	0.03
1,3	eShop	8.6	38	3	0.03
1,35	eShop	8.5	38	3	0.03
1,4	eShop	8.4	38	3	0.04
1,45	eShop	8.4	38	3	0.04
1,47	eShop	8.3	38	3	0.04
1,48	eShop	8.3	38	3	0.04
1,49	eShop	8.3	38	3	0.04

Ø D _c +0.004	12 1220	L ₂	L	Ø D _s	f
	Solid carbide HPC micro-drill				< 1100 N
mm	TiAlN	mm	mm	mm	mm/rev.
1,5	eShop	8.3	38	3	0.04
1,51	eShop	8.3	38	3	0.04
1,52	eShop	8.3	38	3	0.04
1,53	eShop	8.3	38	3	0.04
1,55	eShop	8.2	38	3	0.04
1,6	eShop	8.1	38	3	0.04
1,65	eShop	8.1	38	3	0.04
1,7	eShop	8	38	3	0.04
1,75	eShop	7.9	38	3	0.04
1,8	eShop	7.8	38	3	0.04
1,85	eShop	9.3	38	3	0.04
1,9	eShop	9.2	38	3	0.05
1,95	eShop	9.1	38	3	0.05
1,97	eShop	9.1	38	3	0.05
1,98	eShop	9.1	38	3	0.05
1,99	eShop	9.1	38	3	0.05
2	eShop	10	42	3	0.05
2,01	eShop	10	42	3	0.05
2,02	eShop	10	42	3	0.05
2,03	eShop	10	42	3	0.05
2,05	eShop	10	42	3	0.05
2,1	eShop	9.9	42	3	0.05
2,15	eShop	9.8	42	3	0.05
2,2	eShop	11.7	46	3	0.05
2,25	eShop	11.7	46	3	0.05
2,3	eShop	11.6	46	3	0.05
2,35	eShop	11.5	46	3	0.05
2,4	eShop	11.4	46	3	0.05
2,45	eShop	11.4	46	3	0.05
2,47	eShop	11.3	46	3	0.05
2,48	eShop	11.3	46	3	0.05
2,49	eShop	11.3	46	3	0.05
2,5	eShop	11.3	46	3	0.05
2,51	eShop	11.3	46	3	0.05
2,52	eShop	11.3	46	3	0.05
2,53	eShop	11.3	46	3	0.05

Solid carbide	DIN 6539	Type N	h7	2	118°	30°	h7
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Solid carbide jobber drill

Similar to DIN 6539 (extra short).

Nominal Ø and shank Ø equal.

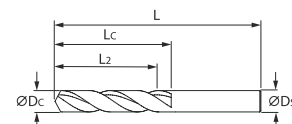
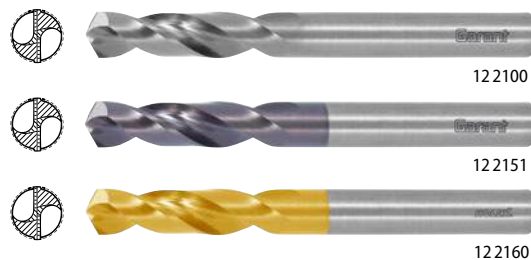
12 2151 – TiAlN coating for even better performance.

12 2160 – TiN coating.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

Non slip clamping in drill chuck No. 341050 with diamond coated jaws.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
12 2100	200	140	140	70	70	60	40	25					20	20	15		140	●	●	●	○	○	○
12 2151	260	180	180	80	90	80	60	35					35	25	25	90	180	●	●	●	○	○	○
12 2160	230	160	160	80	80	70	50	30					30	25	20	85	160	●	●	●	○	○	○

Ø D _c h7	12 2100	12 2151	12 2160	L ₂	L	f
	Garant		HOLEX			< 1100 N
	Solid carbide jobber drill extra short					

mm	TiAlN	TiN	mm	mm	mm/rev.
0,5	eShop	eShop	2,3	20	0.01
0,6	eShop	eShop	2,6	21	0.01
0,7	eShop	eShop	3,5	23	0.01
0,8	eShop	eShop	3,8	24	0.01
0,9	eShop	eShop	4,2	25	0.01
1	eShop	eShop	4,5	26	0.03
1,1	eShop	eShop	5,4	28	0.03
1,2	eShop	eShop	6,2	30	0.03
1,25	eShop	eShop	6,2	30	0.03
1,3	eShop	eShop	6,1	30	0.03
1,4	eShop	eShop	6,9	32	0.03
1,45	eShop	eShop	6,9	32	0.03
1,5	eShop	eShop	6,8	32	0.03
1,55	eShop	eShop	6,7	32	0.03
1,6	eShop	eShop	7,6	34	0.03
1,7	eShop	eShop	7,5	34	0.03
1,8	eShop	eShop	8,3	36	0.03
1,9	eShop	eShop	8,2	36	0.03
2	eShop	eShop	9	38	0.05
2,05	eShop	eShop	9	38	0.05
2,1	eShop	eShop	8,9	38	0.05
2,2	eShop	eShop	9,7	40	0.05
2,3	eShop	eShop	9,6	40	0.05
2,4	eShop	eShop	10,4	43	0.05
2,5	eShop	eShop	10,3	43	0.05
2,6	eShop	eShop	10,1	43	0.05
2,7	eShop	eShop	12	46	0.05
2,8	eShop	eShop	11,8	46	0.05
2,9	eShop	eShop	11,7	46	0.05
3	eShop	eShop	11,5	46	0.08
3,1	eShop	eShop	13,4	49	0.08
3,2	eShop	eShop	13,2	49	0.08
3,25	eShop	eShop	13,2	49	0.08
3,3	eShop	eShop	13,1	49	0.08
3,4	eShop	eShop	14,9	52	0.08
3,5	eShop	eShop	14,8	52	0.08
3,6	eShop	eShop	14,6	52	0.08
3,7	eShop	eShop	14,5	52	0.08
3,8	eShop	eShop	16,3	55	0.08
3,9	eShop	eShop	16,2	55	0.08
4	eShop	eShop	16	55	0.08
4,1	eShop	eShop	15,9	55	0.08
4,2	eShop	eShop	15,7	55	0.08
4,3	eShop	eShop	17,6	58	0.08
4,4	eShop	eShop	17,4	58	0.08
4,5	eShop	eShop	17,3	58	0.08
4,6	eShop	eShop	17,1	58	0.08
4,7	eShop	eShop	17	58	0.08
4,8	eShop	eShop	18,8	62	0.08
4,9	eShop	eShop	18,7	62	0.08
5	eShop	eShop	18,5	62	0.08
5,1	eShop	eShop	18,4	62	0.08
5,2	eShop	eShop	18,2	62	0.08
5,3	eShop	eShop	18,1	62	0.08

Ø D _c h7	12 2100	12 2151	12 2160	L ₂	L	f
	Garant		HOLEX			< 1100 N
	Solid carbide jobber drill extra short					

mm	TiAlN	TiN	mm	mm	mm/rev.
5,4	eShop	eShop	19,9	66	0.08
5,5	eShop	eShop	19,8	66	0.08
5,6	eShop	eShop	19,6	66	0.08
5,7	eShop	eShop	19,5	66	0.08
5,8	eShop	eShop	19,3	66	0.08
5,9	eShop	eShop	19,2	66	0.08
6	eShop	eShop	19	66	0.11
6,1	eShop	eShop	21,9	70	0.11
6,2	eShop	eShop	21,7	70	0.11
6,3	eShop	eShop	21,6	70	0.11
6,4	eShop	eShop	21,4	70	0.11
6,5	eShop	eShop	21,3	70	0.11
6,6	eShop	eShop	21,1	70	0.11
6,7	eShop	eShop	21	70	0.11
6,8	eShop	eShop	23,8	74	0.11
6,9	eShop	eShop	23,7	74	0.11
7	eShop	eShop	23,5	74	0.11
7,1	eShop	eShop	23,4	74	0.11
7,2	eShop	eShop	23,2	74	0.11
7,3	eShop	eShop	23,1	74	0.11
7,4	eShop	eShop	22,9	74	0.11
7,5	eShop	eShop	22,8	74	0.11
7,6	eShop	eShop	25,6	79	0.11
7,7	eShop	eShop	25,5	79	0.11
7,8	eShop	eShop	25,3	79	0.11
7,9	eShop	eShop	25,2	79	0.11
8	eShop	eShop	25	79	0.11
8,1	eShop	eShop	24,9	79	0.11
8,2	eShop	eShop	24,7	79	0.11
8,3	eShop	eShop	24,6	79	0.11
8,4	eShop	eShop	24,4	79	0.11
8,5	eShop	eShop	24,3	79	0.11
8,6	eShop	eShop	27,1	84	0.11
8,7	eShop	eShop	27	84	0.11
8,8	eShop	eShop	26,8	84	0.11
8,9	eShop	eShop	26,7	84	0.11
9	eShop	eShop	26,5	84	0.14
9,1	eShop	eShop	26,4	84	0.14
9,2	eShop	eShop	26,2	84	0.14
9,3	eShop	eShop	26,1	84	0.14
9,4	eShop	eShop	25,9	84	0.14
9,5	eShop	eShop	25,8	84	0.14
9,6	eShop	eShop	28,6	89	0.14
9,7	eShop	eShop	28,5	89	0.14
9,8	eShop	eShop	28,3	89	0.14
9,9	eShop	eShop	28,2	89	0.14
10	eShop	eShop	28	89	0.14
10,2	eShop	eShop	27,7	89	0.14
10,5	eShop	eShop	27,3	89	0.14
11	eShop	eShop	30,5	95	0.14
11,2	eShop	eShop	30,2	95	0.14
11,5	eShop	eShop	29,8	95	0.14
12	eShop	eShop	33	102	0.18
13	eShop	eShop	31,5	102	0.18

Solid carbide	DIN 338	Type N	h7				
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Solid carbide jobber drill

Similar to DIN 338.

Nominal Ø and shank Ø equal.

12 2251 – TiAlN coating for even better performance.

12 2301 – TiN coating.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

Non slip clamping in drill chuck No. 341050 with diamond coated jaws.



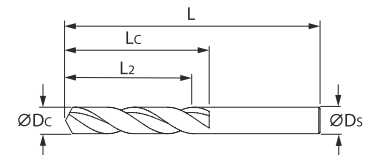
12 2250



12 2251



12 2301



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si										INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
12 2250	200	140	140	70	70	60	40	25					20	20	15		140	●	●	●	○	○	○
12 2251	260	180	180	90	90	80	60	35					35	25	25	90	180	●	●	●	○	○	○
12 2301	230	160	160	80	80	70	50	30					30	25	20	85	160	●	●	●	○	○	○

Ø D _c h7	12 2250	12 2251	12 2301	L ₂	L	
	Garant		HOLEX			< 1100 N f
	Solid carbide jobber drill					
mm	TiAlN	TiN		mm	mm	mm/rev.
1	eShop	eShop	eShop	10.5	34	0.03
1,1	eShop	eShop	eShop	12.4	36	0.03
1,2	eShop	eShop	eShop	14.2	38	0.03
1,3	eShop	eShop	eShop	14.1	38	0.03
1,4	eShop	eShop	eShop	15.9	40	0.03
1,5	eShop	eShop	eShop	15.8	40	0.03
1,6	eShop	eShop	eShop	17.6	43	0.03
1,7	eShop	eShop	eShop	17.5	43	0.03
1,8	eShop	eShop	eShop	19.3	46	0.03
1,9	eShop	eShop	eShop	19.2	46	0.03
2	eShop	eShop	eShop	21	49	0.05
2,1	eShop	eShop	eShop	20.9	49	0.05
2,2	eShop	eShop	eShop	23.7	53	0.05
2,3	eShop	eShop	eShop	23.6	53	0.05
2,4	eShop	eShop	eShop	26.4	57	0.05
2,5	eShop	eShop	eShop	26.3	57	0.05
2,6	eShop	eShop	eShop	26.1	57	0.05
2,7	eShop	eShop	eShop	29	61	0.05
2,8	eShop	eShop	eShop	28.8	61	0.05
2,9	eShop	eShop	eShop	28.7	61	0.05
3	eShop	eShop	eShop	28.5	61	0.08
3,1	eShop	eShop	eShop	31.4	65	0.08
3,2	eShop	eShop	eShop	31.2	65	0.08
3,3	eShop	eShop	eShop	31.1	65	0.08
3,4	eShop	eShop	eShop	33.9	70	0.08
3,5	eShop	eShop	eShop	33.8	70	0.08
3,6	eShop	eShop	eShop	33.6	70	0.08
3,7	eShop	eShop	eShop	33.5	70	0.08
3,8	eShop	eShop	eShop	37.3	75	0.08
3,9	eShop	eShop	eShop	37.2	75	0.08
4	eShop	eShop	eShop	37	75	0.08
4,1	eShop	eShop	eShop	36.9	75	0.08
4,2	eShop	eShop	eShop	36.7	75	0.08
4,3	eShop	eShop	eShop	40.6	80	0.08
4,4	eShop	eShop	eShop	40.4	80	0.08
4,5	eShop	eShop	eShop	40.3	80	0.08
4,6	eShop	eShop	eShop	40.1	80	0.08
4,7	eShop	eShop	eShop	40	80	0.08
4,8	eShop	eShop	eShop	44.8	86	0.08
4,9	eShop	eShop	eShop	44.7	86	0.08
5	eShop	eShop	eShop	44.5	86	0.08
5,1	eShop	eShop	eShop	44.4	86	0.08
5,2	eShop	eShop	eShop	44.2	86	0.08
5,3	eShop	eShop	eShop	44.1	86	0.08
5,4	eShop	eShop	eShop	48.9	93	0.08
5,5	eShop	eShop	eShop	48.8	93	0.08

Ø D _c h7	12 2250	12 2251	12 2301	L ₂	L	
	Garant		HOLEX			< 1100 N f
	Solid carbide jobber drill					
mm	TiAlN	TiN		mm	mm	mm/rev.
5,6	eShop	eShop	eShop	48.6	93	0.08
5,7	eShop	eShop	eShop	48.5	93	0.08
5,8	eShop	eShop	eShop	48.3	93	0.08
5,9	eShop	eShop	eShop	48.2	93	0.08
6	eShop	eShop	eShop	48	93	0.11
6,1	eShop	eShop	eShop	53.9	101	0.11
6,2	eShop	eShop	eShop	53.7	101	0.11
6,3	eShop	eShop	eShop	53.6	101	0.11
6,4	eShop	—	eShop	53.4	101	0.11
6,5	eShop	eShop	eShop	53.3	101	0.11
6,6	eShop	eShop	eShop	53.1	101	0.11
6,7	eShop	eShop	eShop	53	101	0.11
6,8	eShop	eShop	eShop	58.8	109	0.11
6,9	eShop	eShop	eShop	58.7	109	0.11
7	eShop	eShop	eShop	58.5	109	0.11
7,1	eShop	—	eShop	58.4	109	0.11
7,2	eShop	eShop	—	58.2	109	0.11
7,3	eShop	—	—	58.1	109	0.11
7,4	eShop	eShop	eShop	57.9	109	0.11
7,5	eShop	eShop	eShop	57.8	109	0.11
7,6	eShop	—	—	63.6	117	0.11
7,7	eShop	eShop	—	63.5	117	0.11
7,8	eShop	eShop	eShop	63.3	117	0.11
7,9	eShop	—	eShop	63.2	117	0.11
8	eShop	eShop	eShop	63	117	0.11
8,1	eShop	eShop	—	62.9	117	0.11
8,2	eShop	eShop	—	62.7	117	0.11
8,3	eShop	—	eShop	62.6	117	0.11
8,4	eShop	—	—	62.4	117	0.11
8,5	eShop	eShop	eShop	62.3	117	0.11
8,6	eShop	—	eShop	68.1	125	0.11
8,7	eShop	eShop	—	68	125	0.11
8,8	eShop	—	eShop	67.8	125	0.11
9	eShop	eShop	eShop	67.5	125	0.14
9,4	eShop	—	eShop	66.9	125	0.14
9,5	eShop	—	eShop	66.8	125	0.14
9,7	eShop	eShop	—	72.5	133	0.14
9,8	eShop	eShop	eShop	72.3	133	0.14
10	eShop	eShop	eShop	72	133	0.14
10,2	eShop	eShop	eShop	71.7	133	0.14
10,5	eShop	eShop	eShop	71.3	133	0.14
11	eShop	eShop	eShop	77.5	142	0.14
11,5	eShop	—	—	76.8	142	0.14
12	eShop	eShop	eShop	83	151	0.18
13	eShop	eShop	eShop	81.5	151	0.18



Garant Solid carbide HPC drill

DLC coating sp^2 of the latest generation with **low coefficient of friction** results in **outstanding chip clearance**. For **high-performance milling** of **aluminium materials**. **High alignment accuracy** and **roundness of the hole**, thanks to **6 guide chamfers**. Size 1 - 1.5 with 4 guide chamfers.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122307**.
Form **HE**: order with **No. 122306 + 129100HE**.



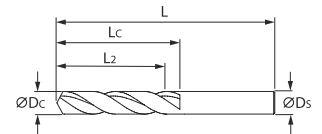
Plain shank DIN 6535HA 12 2306



Weldon shank DIN 6535HB 12 2307



Whistle-Notch shank DIN 6535HE 12 2306 + 129100HE



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	Cu	CuZn	GRP	CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
12 2306	360	400	350	150			120		90		80	70	80	160	200	80	80		●	●		

Ø D _c h7	12 2306	L ₂	L	Ø D _s	Alu f	Ø D _c h7	12 2306	L ₂	L	Ø D _s	Alu f	Ø D _c h7	12 2306	L ₂	L	Ø D _s	Alu f
mm	DIN 6535 HA	mm	mm	mm	mm/rev.	mm	DIN 6535 HA	mm	mm	mm	mm/rev.	mm	DIN 6535 HA	mm	mm	mm	mm/rev.
1	DLC	5.5	45	4	0.1	5,1	DLC	20.4	66	6	0.45	9,1	DLC	33.4	89	10	0.55
1,1	eShop	5.4	45	4	0.15	5,2	eShop	20.2	66	6	0.45	9,2	eShop	33.2	89	10	0.55
1,2	eShop	5.2	45	4	0.15	5,3	eShop	20.1	66	6	0.45	9,3	eShop	33.1	89	10	0.55
1,3	eShop	5.1	45	4	0.15	5,4	eShop	19.9	66	6	0.45	9,4	eShop	32.9	89	10	0.55
1,4	eShop	4.9	45	4	0.15	5,5	eShop	19.8	66	6	0.45	9,5	eShop	32.8	89	10	0.55
1,5	eShop	11.8	55	4	0.15	5,55	eShop	19.7	66	6	0.45	9,6	eShop	32.6	89	10	0.55
1,6	eShop	11.6	55	4	0.2	5,6	eShop	19.6	66	6	0.45	9,7	eShop	32.5	89	10	0.55
1,7	eShop	11.5	55	4	0.2	5,7	eShop	19.5	66	6	0.45	9,8	eShop	32.3	89	10	0.55
1,8	eShop	11.3	55	4	0.2	5,8	eShop	19.3	66	6	0.45	9,9	eShop	32.2	89	10	0.55
1,9	eShop	11.2	55	4	0.2	5,9	eShop	19.2	66	6	0.45	10	eShop	32	89	10	0.55
2	eShop	17	55	4	0.2	6	eShop	19	66	6	0.45	10,2	eShop	39.7	102	12	0.55
2,1	eShop	16.9	55	4	0.22	6,1	eShop	24.9	79	8	0.45	10,3	eShop	39.7	102	12	0.55
2,2	eShop	16.7	55	4	0.22	6,2	eShop	24.7	79	8	0.45	10,5	eShop	39.3	102	12	0.55
2,3	eShop	16.6	55	4	0.22	6,3	eShop	24.6	79	8	0.45	10,8	eShop	38.8	102	12	0.55
2,4	eShop	16.4	55	4	0.22	6,4	eShop	24.4	79	8	0.45	11	eShop	38.5	102	12	0.55
2,5	eShop	16.3	55	4	0.22	6,5	eShop	24.3	79	8	0.45	11,5	eShop	37.8	102	12	0.55
2,6	eShop	16.1	55	4	0.22	6,6	eShop	24.1	79	8	0.45	11,8	eShop	37.3	102	12	0.55
2,7	eShop	16	55	4	0.22	6,7	eShop	24	79	8	0.45	12	eShop	37	102	12	0.55
2,8	eShop	15.8	55	4	0.22	6,8	eShop	23.8	79	8	0.45	12,5	eShop	41.3	107	14	0.65
2,9	eShop	15.7	55	4	0.22	6,9	eShop	23.7	79	8	0.45	12,8	eShop	40.8	107	14	0.65
3	eShop	15.5	62	6	0.22	7	eShop	23.5	79	8	0.45	13	eShop	40.5	107	14	0.65
3,1	eShop	15.4	62	6	0.35	7,1	eShop	30.4	79	8	0.45	13,5	eShop	39.8	107	14	0.65
3,2	eShop	15.2	62	6	0.35	7,2	eShop	30.2	79	8	0.45	13,8	eShop	39.3	107	14	0.65
3,3	eShop	15.1	62	6	0.35	7,3	eShop	30.1	79	8	0.45	14	eShop	39	107	14	0.65
3,4	eShop	14.9	62	6	0.35	7,4	eShop	29.9	79	8	0.45	14,5	eShop	43.3	115	16	0.65
3,5	eShop	14.8	62	6	0.35	7,45	eShop	29.9	79	8	0.45	14,8	eShop	42.8	115	16	0.65
3,6	eShop	14.6	62	6	0.35	7,5	eShop	29.8	79	8	0.45	15	eShop	42.5	115	16	0.65
3,7	eShop	14.5	62	6	0.35	7,6	eShop	29.6	79	8	0.45	15,5	eShop	41.8	115	16	0.65
3,8	eShop	18.3	66	6	0.35	7,7	eShop	29.5	79	8	0.45	15,8	eShop	41.3	115	16	0.65
3,9	eShop	18.2	66	6	0.35	7,8	eShop	29.3	79	8	0.45	16	eShop	41	115	16	0.65
4	eShop	18	66	6	0.35	7,9	eShop	29.2	79	8	0.45	16,5	eShop	48.3	123	18	0.7
4,1	eShop	17.9	66	6	0.35	8	eShop	29	79	8	0.45	16,8	eShop	47.8	123	18	0.7
4,2	eShop	17.7	66	6	0.35	8,1	eShop	34.9	89	10	0.55	17	eShop	47.5	123	18	0.7
4,3	eShop	17.6	66	6	0.35	8,2	eShop	34.7	89	10	0.55	17,5	eShop	46.8	123	18	0.7
4,4	eShop	17.4	66	6	0.35	8,3	eShop	34.6	89	10	0.55	17,8	eShop	46.3	123	18	0.7
4,5	eShop	17.3	66	6	0.35	8,4	eShop	34.4	89	10	0.55	18	eShop	46	123	18	0.7
4,6	eShop	17.1	66	6	0.35	8,5	eShop	34.3	89	10	0.55	18,5	eShop	51.3	131	20	0.7
4,65	eShop	17.1	66	6	0.35	8,6	eShop	34.1	89	10	0.55	18,8	eShop	50.8	131	20	0.7
4,7	eShop	17	66	6	0.35	8,7	eShop	34	89	10	0.55	19	eShop	50.5	131	20	0.7
4,8	eShop	20.8	66	6	0.35	8,8	eShop	33.8	89	10	0.55	19,5	eShop	49.8	131	20	0.7
4,9	eShop	20.7	66	6	0.35	8,9	eShop	33.7	89	10	0.55	19,8	eShop	49.3	131	20	0.7
5	eShop	20.5	66	6	0.35	9	eShop	33.5	89	10	0.55	20	eShop	49	131	20	0.7



GARANT GARANT Diabolo solid carbide HPC drill for hard machining

Cutting chisel edge with high centring accuracy due to **strong core and special point geometry**.

Convex major cutting edges with defined honed edge

ensure the drill has high stability and maximum load capacity.

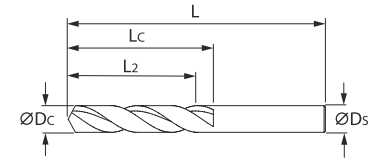
Special multi-nano layer coating for drilling in hardened steels.

Note: HB and HE shanks are available at the same price as HA.
For **HB shanks**: use order **No. 122362**.
For **HE shanks**: use order **No. 122361 + 129100HE**.
Flute length $L_c = L_2 + 1.5 \times D_c$.



Plain shank DIN 6535 HA

12 2361



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
12 2361				90	80	70	65	55	28	16	14	10					70						

Ø D _c h7	TTE	12 2361	L ₂	L	Ø D _s	f
(mm or inch)		GARANT Diabolo solid carbide HPC drill, plain shank DIN 6535 HA	mm	mm	mm	mm/rev.
1		eShop	5.5	45	4	0.03
1,1		eShop	5.4	45	4	0.03
1,2		eShop	5.2	45	4	0.03
1,3		eShop	5.1	45	4	0.03
1,4		eShop	4.9	45	4	0.03
1,5		eShop	11.8	55	4	0.03
1,6		eShop	11.6	55	4	0.04
1,7		eShop	11.5	55	4	0.04
1,8		eShop	11.3	55	4	0.04
1,9		eShop	11.2	55	4	0.04
2		eShop	17	55	4	0.04
2,1		eShop	16.9	55	4	0.05
2,2		eShop	16.7	55	4	0.05
2,3		eShop	16.6	55	4	0.05
2,4		eShop	16.4	55	4	0.05
2,5		eShop	16.3	55	4	0.05
2,6		eShop	16.1	55	4	0.05
2,7		eShop	16	55	4	0.05
2,8		eShop	15.8	55	4	0.05
2,9		eShop	15.7	55	4	0.05
3		eShop	15.5	62	6	0.05
3,1		eShop	15.4	62	6	0.06
3,2		eShop	15.2	62	6	0.06
3,3		eShop	15.1	62	6	0.06
3,4		eShop	14.9	62	6	0.06
3,5		eShop	14.8	62	6	0.06
3,6		eShop	14.6	62	6	0.06
3,7		eShop	14.5	62	6	0.06
3,8		eShop	18.3	66	6	0.06
3,9		eShop	18.2	66	6	0.06
4		eShop	18	66	6	0.06
4,1		eShop	17.9	66	6	0.07
4,2		eShop	17.7	66	6	0.07
4,3		eShop	17.6	66	6	0.07
4,4		eShop	17.4	66	6	0.07
4,5		eShop	17.3	66	6	0.07
4,6		eShop	17.1	66	6	0.07
4,8		eShop	20.8	66	6	0.07
4,9		eShop	20.7	66	6	0.07
5		eShop	20.5	66	6	0.07
5,1		eShop	20.4	66	6	0.08
5,2		eShop	20.2	66	6	0.08
5,3		eShop	20.1	66	6	0.08
5,5		eShop	19.8	66	6	0.08
5,6		eShop	19.6	66	6	0.08
5,8		eShop	19.3	66	6	0.08
5,9		eShop	19.2	66	6	0.08
6		eShop	19	66	6	0.08
6,1		eShop	24.9	79	8	0.09
6,2		eShop	24.7	79	8	0.09
6,3		eShop	24.6	79	8	0.09

Ø D _c h7	TTE	12 2361	L ₂	L	Ø D _s	f
(mm or inch)		GARANT Diabolo solid carbide HPC drill, plain shank DIN 6535 HA	mm	mm	mm	mm/rev.
6,4		eShop	24.4	79	8	0.09
6,5		eShop	24.3	79	8	0.09
6,6		eShop	24.1	79	8	0.09
6,8		eShop	23.8	79	8	0.09
6,9		eShop	23.7	79	8	0.09
7		eShop	23.5	79	8	0.09
7,1		eShop	30.4	79	8	0.09
7,2		eShop	30.2	79	8	0.09
7,5		eShop	29.8	79	8	0.09
7,8		eShop	29.3	79	8	0.09
7,9		eShop	29.2	79	8	0.09
8		eShop	29	79	8	0.09
8,1		eShop	34.9	89	10	0.11
8,2		eShop	34.7	89	10	0.11
8,5		eShop	34.3	89	10	0.11
8,6		eShop	34.1	89	10	0.11
8,7		eShop	34	89	10	0.11
8,8		eShop	33.8	89	10	0.11
9		eShop	33.5	89	10	0.11
9,5		eShop	32.8	89	10	0.11
9,8		eShop	32.3	89	10	0.11
9,9		eShop	32.2	89	10	0.11
10		eShop	32	89	10	0.11
10,2		eShop	39.7	102	12	0.11
10,3		eShop	39.6	102	12	0.11
10,5		eShop	39.3	102	12	0.11
10,8		eShop	38.8	102	12	0.11
11		eShop	38.5	102	12	0.11
11,5		eShop	37.8	102	12	0.11
11,8		eShop	37.3	102	12	0.11
12		eShop	37	102	12	0.11
12,5		eShop	41.3	107	14	0.13
12,8		eShop	40.8	107	14	0.13
13		eShop	40.5	107	14	0.13
13,5		eShop	39.8	107	14	0.13
13,8		eShop	39.3	107	14	0.13
14		eShop	39	107	14	0.13
14,5		eShop	43.3	115	16	0.13
14,8		eShop	42.8	115	16	0.13
14,9		eShop	42.7	115	16	0.13
15		eShop	42.5	115	16	0.13
15,5		eShop	41.8	115	16	0.13
15,8		eShop	41.3	115	16	0.13
15,9		eShop	41.2	115	16	0.13
16		eShop	41	115	16	0.13
16,5		eShop	48.3	123	18	0.15
17		eShop	47.5	123	18	0.15
17,5		eShop	46.8	123	18	0.15
18		eShop	46	123	18	0.15
20		eShop	49	131	20	0.15



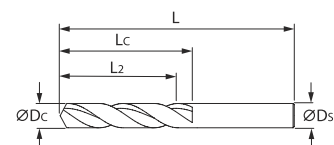
12



Garant Solid carbide HPC drill

Cutting chisel edge with **high centring accuracy** due to **strong core and special point geometry**. **Straight major cutting edges** with slightly honed edges and special flute profile produce **short chips**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122385**.
Form **HE**: order with **No. 122380 + 12900HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
12 2380		245		110	90	85	60	35						55	50	35							

Ø D _c h7	12 2380	L ₂	L	Ø D _s	INOX < 900 N f
	Solid carbide HPC drill plain shank				
	DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.
1	eShop	5.5	45	4	0.05
1,1	eShop	5.4	45	4	0.05
1,2	eShop	5.2	45	4	0.05
1,3	eShop	5.1	45	4	0.05
1,4	eShop	4.9	45	4	0.05
1,5	eShop	11.8	55	4	0.05
1,6	eShop	11.6	55	4	0.05
1,7	eShop	11.5	55	4	0.05
1,8	eShop	11.3	55	4	0.05
1,9	eShop	11.2	55	4	0.05
2	eShop	17	55	4	0.07
2,1	eShop	16.9	55	4	0.07
2,2	eShop	16.7	55	4	0.07
2,3	eShop	16.6	55	4	0.07
2,4	eShop	16.4	55	4	0.07
2,5	eShop	16.3	55	4	0.07
2,6	eShop	16.1	55	4	0.07
2,7	eShop	16	55	4	0.07
2,8	eShop	15.8	55	4	0.07
2,9	eShop	15.7	55	4	0.07
3	eShop	15.5	62	6	0.09
3,1	eShop	15.4	62	6	0.09
3,2	eShop	15.2	62	6	0.09
3,3	eShop	15.1	62	6	0.09
3,4	eShop	14.9	62	6	0.09
3,5	eShop	14.8	62	6	0.09
3,7	eShop	14.5	62	6	0.09
3,8	eShop	18.3	66	6	0.09
3,9	eShop	18.2	66	6	0.09
4	eShop	18	66	6	0.09
4,1	eShop	17.9	66	6	0.09
4,2	eShop	17.7	66	6	0.09
4,3	eShop	17.6	66	6	0.09
4,5	eShop	17.3	66	6	0.09
4,6	eShop	17.1	66	6	0.09
4,8	eShop	20.8	66	6	0.09
4,9	eShop	20.7	66	6	0.09
5	eShop	20.5	66	6	0.09
5,1	eShop	20.4	66	6	0.09
5,2	eShop	20.2	66	6	0.09
5,5	eShop	19.8	66	6	0.09
5,6	eShop	19.6	66	6	0.09
5,7	eShop	19.5	66	6	0.09

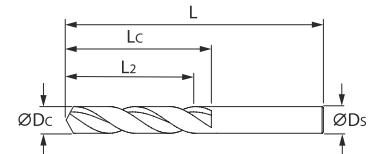
Ø D _c h7	12 2380	L ₂	L	Ø D _s	INOX < 900 N f
	Solid carbide HPC drill plain shank				
	DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.
5,8	eShop	19.3	66	6	0.09
6	eShop	19	66	6	0.12
6,1	eShop	24.9	79	8	0.12
6,2	eShop	24.7	79	8	0.12
6,3	eShop	24.6	79	8	0.12
6,4	eShop	24.4	79	8	0.12
6,5	eShop	24.3	79	8	0.12
6,6	eShop	24.1	79	8	0.12
6,8	eShop	23.8	79	8	0.12
6,9	eShop	23.7	79	8	0.12
7	eShop	23.5	79	8	0.12
7,45	eShop	29.9	79	8	0.12
7,8	eShop	29.3	79	8	0.12
8	eShop	29	79	8	0.12
8,5	eShop	34.3	89	10	0.12
9	eShop	33.5	89	10	0.15
9,35	eShop	33	89	10	0.15
9,5	eShop	32.8	89	10	0.15
9,8	eShop	32.3	89	10	0.15
10	eShop	32	89	10	0.15
10,2	eShop	39.7	102	12	0.15
10,3	eShop	39.6	102	12	0.15
10,5	eShop	39.3	102	12	0.15
10,8	eShop	38.8	102	12	0.15
11	eShop	38.5	102	12	0.15
11,5	eShop	37.8	102	12	0.15
11,8	eShop	37.3	102	12	0.15
12	eShop	37	102	12	0.18
12,2	eShop	41.7	107	14	0.18
12,5	eShop	41.3	107	14	0.18
12,8	eShop	40.8	107	14	0.18
13	eShop	40.5	107	14	0.18
13,5	eShop	39.8	107	14	0.18
13,8	eShop	39.3	107	14	0.18
14	eShop	39	107	14	0.18
15	eShop	42.5	115	16	0.18
15,8	eShop	41.3	115	16	0.18
16	eShop	41	115	16	0.2
16,5	eShop	48.3	123	18	0.2
17	(eShop)	47.5	123	18	0.2
18,5	eShop	51.3	131	20	0.2
19,5	eShop	49.8	131	20	0.23
20	eShop	49	131	20	0.23



HOLEX Pro INOX solid carbide high-performance drill

Efficient drilling especially for use in **stainless and acid-resistant steels**.
Straight main cutting edges with **optimised cutting edge design** for improved chip breaking behaviour. Enlarged flutes for **excellent chip evacuation**.
Increased wear resistance due to **improved carbide substrate** and **high temperature resistant coating**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and HE shanks are available at the same price as HA.
For **HB shanks**: use order **no. 122391**.
For **HE shanks**: use order **no. 122392**.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast Si 										INOX	INOX	Ti	Graphite GRP CRP	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	N							
12 2390	140	120	80	75	65								35	30									

Ø D _c m7	12 2390	L ₂	L	Ø D _s	INOX < 900 N	f	Ø D _c m7	12 2390	L ₂	L	Ø D _s	INOX < 900 N	f	Ø D _c m7	12 2390	L ₂	L	Ø D _s	INOX < 900 N	f
	HOLEX Pro Inox solid carbide high-performance drill, plain shank							HOLEX Pro Inox solid carbide high-performance drill, plain shank							HOLEX Pro Inox solid carbide high-performance drill, plain shank					
	DIN 6535 HA							DIN 6535 HA							DIN 6535 HA					
mm	AITiN	mm	mm	mm	mm/rev.		mm	AITiN	mm	mm	mm	mm/rev.		mm	AITiN	mm	mm	mm	mm/rev.	
1	eShop	4.5	45	4	0.02		5,3	eShop	20.1	66	6	0.08		9,6	eShop	23.6	89	10	0.12	
1,1	eShop	4.9	45	4	0.02		5,4	eShop	19.9	66	6	0.08		9,7	eShop	32.5	89	10	0.12	
1,2	eShop	5.2	45	4	0.02		5,5	eShop	19.8	66	6	0.08		9,8	eShop	32.3	89	10	0.12	
1,3	eShop	5.1	45	4	0.02		5,6	eShop	19.6	66	6	0.08		9,9	eShop	32.2	89	10	0.12	
1,4	eShop	6.4	45	4	0.02		5,7	eShop	19.5	66	6	0.08		10	eShop	32	89	10	0.12	
1,5	eShop	6.8	50	4	0.03		5,8	eShop	19.3	66	6	0.08		10,2	eShop	39.7	102	12	0.12	
1,6	eShop	7.1	50	4	0.03		5,9	eShop	19.2	66	6	0.08		10,3	eShop	39.6	102	12	0.12	
1,7	eShop	7.5	50	4	0.03		6	eShop	19	66	6	0.08		10,5	eShop	39.3	102	12	0.12	
1,8	eShop	8.3	50	4	0.03		6,1	eShop	24.9	79	8	0.08		10,8	eShop	38.8	102	12	0.13	
1,9	eShop	8.7	50	4	0.03		6,2	eShop	24.7	79	8	0.09		11	eShop	38.5	102	12	0.13	
2	eShop	13	58	6	0.03		6,3	eShop	24.6	79	8	0.09		11,2	eShop	37.8	102	12	0.13	
2,1	eShop	12.9	58	6	0.03		6,4	eShop	24.4	79	8	0.09		11,5	eShop	37.8	102	12	0.13	
2,2	eShop	12.7	58	6	0.04		6,5	eShop	24.3	79	8	0.09		11,8	eShop	11.8	102	12	0.13	
2,3	eShop	12.6	58	6	0.04		6,6	eShop	24.1	79	8	0.09		12	eShop	37	102	12	0.14	
2,4	eShop	12.4	58	6	0.04		6,7	eShop	24	79	8	0.09		12,2	eShop	41.7	107	14	0.14	
2,5	eShop	12.3	58	6	0.04		6,8	eShop	23.8	79	8	0.09		12,5	eShop	41.3	107	14	0.14	
2,6	eShop	12.1	58	6	0.04		6,9	eShop	23.7	79	8	0.09		12,8	eShop	40.8	107	14	0.14	
2,7	eShop	12	58	6	0.04		7	eShop	23.5	79	8	0.09		13	eShop	40.5	107	14	0.14	
2,8	eShop	11.8	58	6	0.04		7,1	eShop	30.4	79	8	0.09		13,5	eShop	39.8	107	14	0.15	
2,9	eShop	11.7	58	6	0.05		7,2	eShop	30.2	79	8	0.1		13,8	eShop	39.3	107	14	0.15	
3	eShop	15.5	62	6	0.05		7,3	eShop	30.1	79	8	0.1		14	eShop	39	107	14	0.15	
3,1	eShop	15.4	62	6	0.05		7,4	eShop	29.9	79	8	0.1		14,2	eShop	43.7	115	16	0.15	
3,2	eShop	15.2	62	6	0.05		7,5	eShop	29.8	79	8	0.1		14,5	eShop	43.3	115	16	0.15	
3,3	eShop	15.1	62	6	0.05		7,6	eShop	29.6	79	8	0.1		14,8	eShop	42.8	115	16	0.16	
3,4	eShop	14.9	62	6	0.05		7,7	eShop	29.5	79	8	0.1		15	eShop	42.5	115	16	0.16	
3,5	eShop	14.8	62	6	0.05		7,8	eShop	29.3	79	8	0.1		15,1	eShop	42.4	115	16	0.16	
3,6	eShop	14.6	62	6	0.06		7,9	eShop	29.2	79	8	0.1		15,2	eShop	41.8	115	16	0.16	
3,7	eShop	14.5	62	6	0.06		8	eShop	29	79	8	0.1		15,5	eShop	41.8	115	16	0.16	
3,8	eShop	18.3	66	6	0.06		8,1	eShop	34.9	89	10	0.1		15,8	eShop	41.3	115	16	0.16	
3,9	eShop	18.2	66	6	0.06		8,2	eShop	34.7	89	10	0.1		16	eShop	41	115	16	0.17	
4	eShop	18	66	6	0.06		8,3	eShop	34.6	89	10	0.11		16,5	eShop	48.3	123	18	0.17	
4,1	eShop	17.9	66	6	0.06		8,4	eShop	34.4	89	10	0.11		17	eShop	47.5	123	18	0.17	
4,2	eShop	17.7	66	6	0.06		8,5	eShop	34.3	89	10	0.11		17,3	eShop	47.1	123	18	0.18	
4,3	eShop	17.6	66	6	0.06		8,6	eShop	34.1	89	10	0.11		17,5	eShop	46.8	123	18	0.18	
4,4	eShop	17.4	66	6	0.07		8,7	eShop	34	89	10	0.11		17,7	eShop	46.5	123	18	0.18	
4,5	eShop	17.3	66	6	0.07		8,8	eShop	33.8	89	10	0.11		18	eShop	46	123	18	0.18	
4,6	eShop	17.1	66	6	0.07		8,9	eShop	33.7	89	10	0.11		18,5	eShop	51.3	131	20	0.19	
4,7	eShop	17	66	6	0.07		9	eShop	33.5	89	10	0.11		19	eShop	50.5	131	20	0.19	
4,8	eShop	20.8	66	6	0.07		9,1	eShop	33.4	89	10	0.11		19,3	eShop	50.1	131	20	0.19	
4,9	eShop	20.7	66	6	0.07		9,2	eShop	33.2	89	10	0.11		19,5	eShop	49.8	131	20	0.2	
5	eShop	20.5	66	6	0.07		9,3	eShop	33.1	89	10	0.11		20	eShop	49	131	20	0.2	
5,1	eShop	20.4	66	6	0.07		9,4	eShop	32.9	89	10	0.12								
5,2	eShop	20.2	66	6	0.07		9,5	eShop	32.8	89	10	0.12								





HOLEX Pro INOX solid carbide high-performance drill

Efficient drilling especially for use in **stainless and acid-resistant steels**.

Straight main cutting edges with **optimised cutting edge design** for improved chip breaking behaviour.

Enlarged flutes for **excellent chip evacuation**.

Increased wear resistance due to **improved carbide substrate** and **high temperature resistant coating**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and HE shanks are available at the same price as HA.
For **HB shanks**: use order no. **122491**.
For **HE shanks**: use order no. **122492**.



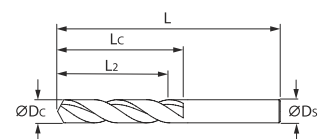
Plain shank DIN 6535 HA 12 2490



Weldon shank DIN 6535 HB 12 2491



Whistle-Notch shank DIN 6535 HE 12 2492



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	500 N	750 N	900 N	1100 N	1400 N	55 HRC	60 HRC	65 HRC	67 HRC	70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	55	45	35	N						
12 2490		140	120	120	110	90	80																

$\varnothing D_c$ m7	12 2490	L_2	L	$\varnothing D_s$	INOX < 900 N f
	HOLEX Pro Innox solid carbide high-performance drill, plain shank				
	DIN 6535 HA				
mm	AITIN	mm	mm	mm	mm/rev.
2	eShop	9	50	4	0.03
2,1	eShop	9.35	55	4	0.03
2,2	eShop	9.7	55	4	0.04
2,3	eShop	10.6	55	4	0.04
2,4	eShop	10.9	55	4	0.04
2,5	eShop	11.3	55	4	0.04
2,6	eShop	11.6	55	4	0.04
2,7	eShop	12	55	4	0.04
2,8	eShop	12.8	55	4	0.04
2,9	eShop	13.2	55	4	0.05
3	eShop	15.5	62	6	0.05
3,1	eShop	15.4	62	6	0.05
3,2	eShop	15.2	62	6	0.05
3,3	eShop	15.1	62	6	0.05
3,4	eShop	14.9	62	6	0.05
3,5	eShop	14.8	62	6	0.05
3,6	eShop	14.6	62	6	0.06
3,7	eShop	14.5	62	6	0.06
3,8	eShop	18.3	66	6	0.06
3,9	eShop	18.2	66	6	0.06
4	eShop	18	66	6	0.06
4,1	eShop	17.9	66	6	0.06
4,2	eShop	17.7	66	6	0.06
4,3	eShop	17.6	66	6	0.06
4,4	eShop	17.4	66	6	0.07
4,5	eShop	17.3	66	6	0.07
4,6	eShop	17.1	66	6	0.07
4,7	eShop	17	66	6	0.07
4,8	eShop	20.8	66	6	0.07
4,9	eShop	20.7	66	6	0.07
5	eShop	20.5	66	6	0.07
5,1	eShop	20.4	66	6	0.07
5,2	eShop	20.2	66	6	0.07
5,3	eShop	20.1	66	6	0.08
5,4	eShop	19.9	66	6	0.08
5,5	eShop	19.8	66	6	0.08
5,6	eShop	19.6	66	6	0.08
5,7	eShop	19.5	66	6	0.08
5,8	eShop	19.3	66	6	0.08
5,9	eShop	19.2	66	6	0.08

$\varnothing D_c$ m7	12 2490	L_2	L	$\varnothing D_s$	INOX < 900 N f
	HOLEX Pro Innox solid carbide high-performance drill, plain shank				
	DIN 6535 HA				
mm	AITIN	mm	mm	mm	mm/rev.
6	eShop	19	66	6	0.08
6,1	eShop	24.9	79	8	0.08
6,2	eShop	24.7	79	8	0.09
6,3	eShop	24.6	79	8	0.09
6,4	eShop	24.4	79	8	0.09
6,5	eShop	24.3	79	8	0.09
6,6	eShop	24.1	79	8	0.09
6,7	eShop	24	79	8	0.09
6,8	eShop	23.8	79	8	0.09
6,9	eShop	23.7	79	8	0.09
7	eShop	23.5	79	8	0.09
7,1	eShop	30.4	79	8	0.09
7,2	eShop	30.2	79	8	0.1
7,3	eShop	30.1	79	8	0.1
7,4	eShop	29.9	79	8	0.1
7,5	eShop	29.8	79	8	0.1
7,6	eShop	29.6	79	8	0.1
7,7	eShop	29.5	79	8	0.1
7,8	eShop	29.3	79	8	0.1
7,9	eShop	29.2	79	8	0.1
8	eShop	29	79	8	0.1
8,1	eShop	34.9	89	10	0.1
8,2	eShop	34.7	89	10	0.1
8,3	eShop	34.6	89	10	0.11
8,4	eShop	34.4	89	10	0.11
8,5	eShop	34.3	89	10	0.11
8,6	eShop	34.1	89	10	0.11
8,7	eShop	34	89	10	0.11
8,8	eShop	33.8	89	10	0.11
8,9	eShop	33.7	89	10	0.11
9	eShop	33.5	89	10	0.11
9,1	eShop	33.4	89	10	0.11
9,2	eShop	33.2	89	10	0.11
9,3	eShop	33.1	89	10	0.11
9,4	eShop	32.9	89	10	0.12
9,5	eShop	32.8	89	10	0.12
9,6	eShop	32.6	89	10	0.12
9,7	eShop	32.5	89	10	0.12
9,8	eShop	32.3	89	10	0.12
9,9	eShop	32.2	89	10	0.12

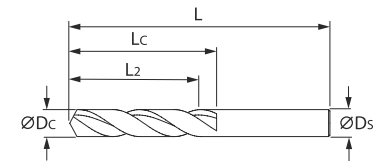
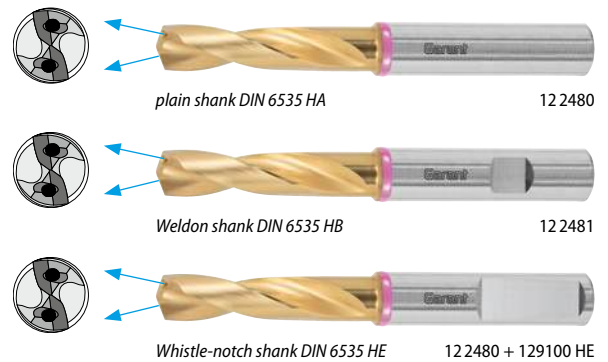
$\varnothing D_c$ m7	12 2490	L_2	L	$\varnothing D_s$	INOX < 900 N f
	HOLEX Pro Innox solid carbide high-performance drill, plain shank				
	DIN 6535 HA				
mm	AITIN	mm	mm	mm	mm/rev.
10	eShop	32	89	10	0.12
10,2	eShop	39.7	102	12	0.12
10,3	eShop	40	102	12	0.12
10,5	eShop	39.3	102	12	0.12
10,8	eShop	38.8	102	12	0.13
11	eShop	38.5	102	12	0.13
11,2	eShop	38.2	102	12	0.13
11,5	eShop	37.8	102	12	0.13
11,8	eShop	37.3	102	12	0.13
12	eShop	37	102	12	0.14
12,2	eShop	41.7	107	14	0.14
12,5	eShop	41.3	107	14	0.14
12,8	eShop	40.8	107	14	0.14
13	eShop	40.5	107	14	0.14
13,5	eShop	39.8	107	14	0.15
13,8	eShop	39.3	107	14	0.15
14	eShop	39	107	14	0.15
14,2	eShop	43.7	115	16	0.15
14,5	eShop	43.3	115	16	0.15
14,8	eShop	42.8	115	16	0.16
15	eShop	42.5	115	16	0.16
15,1	eShop	42.4	115	16	0.16
15,2	eShop	42.2	115	16	0.16
15,5	eShop	41.8	115	16	0.16
15,8	eShop	41.3	115	16	0.16
16	eShop	41	115	16	0.17
16,5	eShop	48.3	123	18	0.17
16,8	eShop	47.8	123	18	0.17
17	eShop	47.5	123	18	0.17
17,3	eShop	47.1	123	18	0.18
17,5	eShop	46.8	123	18	0.18
17,7	eShop	46.5	123	18	0.18
18	eShop	46	123	18	0.18
18,5	eShop	51.3	131	20	0.19
19	eShop	50.5	131	20	0.19
19,3	eShop	50.1	131	20	0.19
19,5	eShop	49.8	131	20	0.2
20	eShop	49	131	20	0.2



Garant Solid carbide HPC drill

Specially for machining **titanium-based and nickel-based alloys**. With wear-resistant, ultra-smooth TiAlSiN high-performance coating for a **long tool life** combined with **optimum bore quality** and **very low burr formation**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and HE shanks are available at the same price as HA.
For **HB**: use order **No. 122481**.
For **HE**: use order **No. 122480** and **129100HE**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Inconel	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	S	N					
12 2480																45	35						

$\varnothing D_c$ m7	12 2480	L_2	L	$\varnothing D_s$	Ti > 850 N f
	Solid carbide HPC drill, plain shank				
	DIN 6535 HA				
mm	TiAlSiN	mm	mm	mm	mm/rev.
3	eShop	15.5	62	6	0.04
3,1	eShop	15.4	62	6	0.04
3,2	eShop	15.2	62	6	0.04
3,3	eShop	15.1	62	6	0.04
3,4	eShop	14.9	62	6	0.05
3,5	eShop	14.8	62	6	0.05
3,6	eShop	14.6	62	6	0.05
3,7	eShop	14.5	62	6	0.05
3,8	eShop	18.3	66	6	0.05
3,9	eShop	18.2	66	6	0.05
4	eShop	18	66	6	0.05
4,1	eShop	17.9	66	6	0.06
4,2	eShop	17.7	66	6	0.06
4,3	eShop	17.6	66	6	0.06
4,4	eShop	17.4	66	6	0.06
4,5	eShop	17.3	66	6	0.06
4,6	eShop	17.1	66	6	0.06
4,7	eShop	17	66	6	0.06
4,8	eShop	20.8	66	6	0.06
4,9	eShop	20.7	66	6	0.07
5	eShop	20.5	66	6	0.07
5,1	eShop	20.4	66	6	0.07
5,2	eShop	20.2	66	6	0.07
5,3	eShop	20.1	66	6	0.07
5,4	eShop	19.9	66	6	0.07
5,5	eShop	19.8	66	6	0.07
5,6	eShop	19.6	66	6	0.08
5,7	eShop	19.5	66	6	0.08
5,8	eShop	19.3	66	6	0.08
5,9	eShop	19.2	66	6	0.08
6	eShop	19	66	6	0.08
6,1	eShop	24.9	79	8	0.08
6,2	eShop	24.7	79	8	0.08
6,3	eShop	24.6	79	8	0.08
6,4	eShop	24.4	79	8	0.09
6,5	eShop	24.5	79	8	0.09
6,6	eShop	24.1	79	8	0.09
6,7	eShop	24	79	8	0.09
6,8	eShop	23.8	79	8	0.09
6,9	eShop	23.7	79	8	0.09
7	eShop	23.5	79	8	0.09
7,1	eShop	23.4	79	8	0.09
7,2	eShop	23.2	79	8	0.1
7,3	eShop	23.1	79	8	0.1

$\varnothing D_c$ m7	12 2480	L_2	L	$\varnothing D_s$	Ti > 850 N f
	Solid carbide HPC drill, plain shank				
	DIN 6535 HA				
mm	TiAlSiN	mm	mm	mm	mm/rev.
7,4	eShop	22.9	79	8	0.1
7,5	eShop	22.8	79	8	0.1
7,6	eShop	22.6	79	8	0.1
7,7	eShop	22.5	79	8	0.1
7,8	eShop	22.3	79	8	0.1
7,9	eShop	22.2	79	8	0.1
8	eShop	22	79	8	0.1
8,1	eShop	34.9	89	10	0.11
8,2	eShop	34.7	89	10	0.11
8,3	eShop	34.6	89	10	0.11
8,4	eShop	34.4	89	10	0.11
8,5	eShop	34.3	89	10	0.11
8,6	eShop	34.1	89	10	0.11
8,7	eShop	34	89	10	0.11
8,8	eShop	33.8	89	10	0.11
8,9	eShop	33.7	89	10	0.12
9	eShop	33.5	89	10	0.12
9,1	eShop	33.4	89	10	0.12
9,2	eShop	33.2	89	10	0.12
9,3	eShop	33.1	89	10	0.12
9,4	eShop	32.9	89	10	0.12
9,5	eShop	32.8	89	10	0.12
9,6	eShop	32.6	89	10	0.12
9,7	eShop	32.5	89	10	0.12
9,8	eShop	32.3	89	10	0.13
9,9	eShop	32.2	89	10	0.13
10	eShop	32	89	10	0.13
10,2	eShop	39.7	102	12	0.13
10,5	eShop	39.3	102	12	0.13
10,8	eShop	38.8	102	12	0.14
11	eShop	38.5	102	12	0.14
11,2	eShop	38.2	102	12	0.14
11,5	eShop	37.8	102	12	0.14
11,8	eShop	37.3	102	12	0.14
12	eShop	37	102	12	0.15
12,2	eShop	41.7	107	14	0.15
12,5	eShop	41.3	107	14	0.15
13	eShop	40.5	107	14	0.16
13,5	eShop	39.8	107	14	0.16
14	eShop	39	107	14	0.16
14,5	eShop	43.3	115	16	0.17
15	eShop	42.5	115	16	0.17
15,5	eShop	41.8	115	16	0.17
16	eShop	41	115	16	0.18



Garant GARANT Uni Hero solid carbide high-performance drill

The ultimate in universality and profitability in one tool.

Robust tool design and **convex-concave curved cutting edge design**

for optimum tool stability and chip breakage behaviour in a wide range of materials.

Special flute geometry and **polished flutes**

for ideal chip evacuation and maximum process reliability.

Ultra-smooth TiAlSiN high-performance coating

to effectively reduce wear and the formation of built-up edges.

Note:

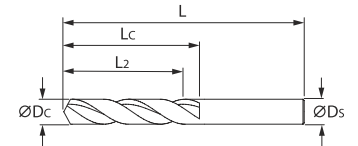
Flute length $L_c = L_2 + 1.5 \times D_c$.

HB and HE shanks are available at the same price as HA.

For **HB shanks**: use order no. **122451**.

For **HE shanks**: order with No. **122450** and **12900HE**.

Articles with prices in brackets: Different delivery time and minimum order quantity is 3 pieces.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
12 2450	190	200		160	150	140	110	90						90	80	40	130	●	●	●	●	○	

Ø D _c h7	12 2450 GARANT Uni Hero solid carbide drill plain shank DIN 6535 HA	Tolerance nominal Ø	L ₂	L	Ø D _s	f < 1100 N
mm	TiAlSiN		mm	mm	mm	mm/rev.
2,5	eShop	h7	15.3	55	4	0.07
2,6	eShop	h7	15.1	55	4	0.08
2,7	eShop	h7	15	55	4	0.08
2,8	eShop	h7	14.8	55	4	0.08
2,9	eShop	h7	14.7	55	4	0.08
3	eShop	h7	15.5	62	6	0.09
3,1	eShop	h7	15.4	62	6	0.09
3,2	eShop	h7	15.2	62	6	0.09
3,3	eShop	h7	15.1	62	6	0.09
3,4	eShop	h7	14.9	62	6	0.1
3,5	eShop	h7	14.8	62	6	0.1
3,6	eShop	h7	14.6	62	6	0.1
3,7	eShop	h7	14.5	62	6	0.1
3,8	eShop	h7	18.3	66	6	0.11
3,9	eShop	h7	18.2	66	6	0.11
4	eShop	h7	18	66	6	0.11
4,1	eShop	h7	17.9	66	6	0.11
4,2	eShop	h7	17.7	66	6	0.12
4,3	eShop	h7	17.6	66	6	0.12
4,4	eShop	h7	17.4	66	6	0.12
4,5	eShop	h7	17.3	66	6	0.12
4,6	eShop	h7	17.1	66	6	0.12
4,7	eShop	h7	17	66	6	0.13
4,8	eShop	h7	20.8	66	6	0.13
4,9	eShop	h7	20.7	66	6	0.13
5	eShop	h7	20.5	66	6	0.13
5,1	eShop	h7	20.4	66	6	0.13
5,2	eShop	h7	20.2	66	6	0.14
5,3	eShop	h7	20.1	66	6	0.14
5,4	eShop	h7	19.9	66	6	0.14
5,5	eShop	h7	19.8	66	6	0.14
5,6	eShop	h7	19.6	66	6	0.15
5,7	eShop	h7	19.5	66	6	0.15
5,8	eShop	h7	19.3	66	6	0.15
5,9	eShop	h7	19.2	66	6	0.15
6	eShop	h7	19	66	6	0.15
6,1	eShop	h7	24.9	79	8	0.15
6,2	eShop	h7	24.7	79	8	0.16
6,3	eShop	h7	24.6	79	8	0.16
6,4	eShop	h7	24.4	79	8	0.16
6,5	eShop	h7	24.3	79	8	0.16
6,6	eShop	h7	24.1	79	8	0.16
6,7	eShop	h7	24	79	8	0.17
6,8	eShop	h7	23.8	79	8	0.17
6,9	eShop	h7	23.7	79	8	0.17
7	eShop	h7	23.5	79	8	0.17
7,1	eShop	h7	30.4	79	8	0.17
7,2	eShop	h7	30.2	79	8	0.18
7,3	eShop	h7	30.1	79	8	0.18
7,4	eShop	h7	29.9	79	8	0.18
7,5	eShop	h7	29.8	79	8	0.18

Ø D _c h7	12 2450 GARANT Uni Hero solid carbide drill plain shank DIN 6535 HA	Tolerance nominal Ø	L ₂	L	Ø D _s	f < 1100 N
mm	TiAlSiN		mm	mm	mm	mm/rev.
7,6	eShop	h7	29.6	79	8	0.18
7,7	eShop	h7	29.5	79	8	0.18
7,8	eShop	h7	29.3	79	8	0.19
7,9	eShop	h7	29.2	79	8	0.19
8	eShop	h7	29	79	8	0.19
8,1	eShop	h7	34.9	89	10	0.19
8,2	eShop	h7	34.7	89	10	0.19
8,3	eShop	h7	34.6	89	10	0.19
8,4	eShop	h7	34.4	89	10	0.2
8,5	eShop	h7	34.3	89	10	0.2
8,6	eShop	h7	34.1	89	10	0.2
8,7	eShop	h7	34	89	10	0.2
8,8	eShop	h7	33.8	89	10	0.2
8,9	eShop	h7	33.7	89	10	0.2
9	eShop	h7	33.5	89	10	0.2
9,1	eShop	h7	33.4	89	10	0.21
9,2	eShop	h7	33.2	89	10	0.21
9,3	eShop	h7	33.1	89	10	0.21
9,4	eShop	h7	32.9	89	10	0.21
9,5	eShop	h7	32.8	89	10	0.21
9,6	eShop	h7	32.6	89	10	0.21
9,7	eShop	h7	32.5	89	10	0.21
9,8	eShop	h7	32.3	89	10	0.22
9,9	eShop	h7	32.2	89	10	0.22
10	eShop	h7	32	89	10	0.22
10,2	eShop	h7	39.7	102	12	0.22
10,3	eShop	h7	39.6	102	12	0.22
10,5	eShop	h7	39.3	102	12	0.22
10,8	eShop	h7	38.8	102	12	0.23
11	eShop	h7	38.5	102	12	0.23
11,2	eShop	h7	38.2	102	12	0.23
11,5	eShop	h7	37.8	102	12	0.24
11,8	eShop	h7	37.3	102	12	0.24
12	eShop	h7	37	102	12	0.24
12,2	(eShop)	h7	41.7	107	14	0.24
12,5	eShop	h7	41.3	107	14	0.25
12,8	(eShop)	h7	40.8	107	14	0.25
13	eShop	h7	40.5	107	14	0.25
13,2	(eShop)	h7	40.2	107	14	0.25
13,5	eShop	h7	39.8	107	14	0.25
13,8	(eShop)	h7	39.3	107	14	0.26
14	eShop	h7	39	107	14	0.26
14,2	(eShop)	h7	43.7	115	16	0.26
14,5	eShop	h7	43.3	115	16	0.26
14,8	(eShop)	h7	42.8	115	16	0.26
15	eShop	h7	42.5	115	16	0.26
15,2	(eShop)	h7	42.2	115	16	0.27
15,3	(eShop)	h7	42.1	115	16	0.27
15,5	(eShop)	h7	41.8	115	16	0.27
15,8	(eShop)	h7	41.3	115	16	0.27
16	eShop	h7	41	115	16	0.27



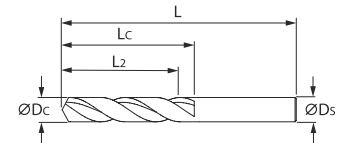
GARANT Master Steel Speed solid carbide drill

Developed for use with **very high cutting speeds**. Outstandingly suitable for machines with **low power output** and high speeds.

- Clear reduction in cutting forces due to special cutter geometry.
- Coating for best wear resistance even at high process temperatures.
- Polished flutes for good chip clearance.

A **slim chisel edge** and the **special arrangement of the 4 guide chamfers** ensure **high positioning and alignment accuracy**. Optimised micro-geometry for increased working life and performance capability.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122416**.
Form **HE**: order with **No. 122415 + 129100HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
12 2415				170	150	120	110	60								110	100						

Ø D _c h7	12 2415	L ₂	L	Ø D _s	f	Ø D _c h7	12 2415	L ₂	L	Ø D _s	f	Ø D _c h7	12 2415	L ₂	L	Ø D _s	f
	GARANT Master Steel Speed solid carbide drill, plain shank						GARANT Master Steel Speed solid carbide drill, plain shank						GARANT Master Steel Speed solid carbide drill, plain shank				
	DIN 6535 HA						DIN 6535 HA						DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.
2	eShop	17	55	4	0.09	6,4	eShop	24.4	79	8	0.22	11	eShop	38.5	102	12	0.28
2,1	eShop	16.9	55	4	0.09	6,5	eShop	24.3	79	8	0.22	11,1	eShop	38.4	102	12	0.28
2,2	eShop	16.7	55	4	0.09	6,6	eShop	24.1	79	8	0.22	11,2	eShop	38.2	102	12	0.28
2,3	eShop	16.6	55	4	0.09	6,7	eShop	24	79	8	0.22	11,3	eShop	38.1	102	12	0.28
2,4	eShop	16.4	55	4	0.09	6,8	eShop	23.8	79	8	0.22	11,4	eShop	37.9	102	12	0.28
2,5	eShop	16.3	55	4	0.09	6,9	eShop	23.7	79	8	0.22	11,5	eShop	37.8	102	12	0.28
2,6	eShop	16.1	55	4	0.09	7	eShop	23.5	79	8	0.22	11,6	eShop	37.6	102	12	0.28
2,7	eShop	16	55	4	0.09	7,1	eShop	30.4	79	8	0.22	11,7	eShop	37.5	102	12	0.28
2,8	eShop	15.8	55	4	0.09	7,2	eShop	30.2	79	8	0.22	11,8	eShop	37.3	102	12	0.28
2,9	eShop	15.7	55	4	0.09	7,3	eShop	30.1	79	8	0.22	11,9	eShop	37.2	102	12	0.28
3	eShop	15.5	62	6	0.12	7,4	eShop	29.9	79	8	0.22	12	eShop	37	102	12	0.28
3,1	eShop	15.4	62	6	0.12	7,5	eShop	29.8	79	8	0.22	12,2	eShop	41.7	107	14	0.31
3,2	eShop	15.2	62	6	0.12	7,6	eShop	29.6	79	8	0.22	12,5	eShop	41.3	107	14	0.31
3,3	eShop	15.1	62	6	0.12	7,7	eShop	29.5	79	8	0.22	12,8	eShop	40.8	107	14	0.31
3,4	eShop	14.9	62	6	0.12	7,8	eShop	29.3	79	8	0.22	13	eShop	40.5	107	14	0.31
3,5	eShop	14.8	62	6	0.12	7,9	eShop	29.2	79	8	0.22	13,2	eShop	40.2	107	14	0.31
3,6	eShop	14.6	62	6	0.12	8	eShop	29	79	8	0.22	13,5	eShop	39.8	107	14	0.31
3,7	eShop	14.5	62	6	0.12	8,1	eShop	34.9	89	10	0.26	13,8	eShop	39.3	107	14	0.31
3,8	eShop	18.3	66	6	0.12	8,2	eShop	34.7	89	10	0.26	14	eShop	39	107	14	0.31
3,9	eShop	18.2	66	6	0.12	8,3	eShop	34.6	89	10	0.26	14,2	eShop	43.7	115	16	0.34
4	eShop	18	66	6	0.12	8,4	eShop	34.4	89	10	0.26	14,5	eShop	43.3	115	16	0.34
4,1	eShop	17.9	66	6	0.16	8,5	eShop	34.3	89	10	0.26	14,8	eShop	42.8	115	16	0.34
4,2	eShop	17.7	66	6	0.16	8,6	eShop	34.1	89	10	0.26	15	eShop	42.5	115	16	0.34
4,3	eShop	17.6	66	6	0.16	8,7	eShop	34	89	10	0.26	15,2	eShop	42.2	115	16	0.34
4,4	eShop	17.4	66	6	0.16	8,8	eShop	33.8	89	10	0.26	15,8	eShop	41.3	115	16	0.34
4,5	eShop	17.3	66	6	0.16	9	eShop	33.5	89	10	0.26	16	eShop	41	115	16	0.34
4,7	eShop	17	66	6	0.16	9,1	eShop	33.4	89	10	0.26	16,2	eShop	48.7	123	18	0.35
4,8	eShop	20.8	66	6	0.16	9,3	eShop	33.1	89	10	0.26	16,5	eShop	48.3	123	18	0.35
4,9	eShop	20.7	66	6	0.16	9,4	eShop	32.9	89	10	0.26	16,8	eShop	47.8	123	18	0.35
5	eShop	20.5	66	6	0.16	9,5	eShop	32.8	89	10	0.26	17	eShop	47.5	123	18	0.35
5,1	eShop	20.4	66	6	0.19	9,7	eShop	32.5	89	10	0.26	17,5	eShop	46.8	123	18	0.35
5,2	eShop	20.2	66	6	0.19	9,8	eShop	32.3	89	10	0.26	17,8	eShop	46.3	123	18	0.35
5,3	eShop	20.1	66	6	0.19	9,9	eShop	32.2	89	10	0.26	18	eShop	46	123	18	0.35
5,4	eShop	19.9	66	6	0.19	10	eShop	32	89	10	0.26	18,2	eShop	51.7	131	20	0.38
5,5	eShop	19.8	66	6	0.19	10,1	eShop	39.9	102	12	0.28	18,5	eShop	51.3	131	20	0.38
5,6	eShop	19.6	66	6	0.19	10,2	eShop	39.7	102	12	0.28	18,8	eShop	50.8	131	20	0.38
5,7	eShop	19.5	66	6	0.19	10,3	eShop	39.6	102	12	0.28	19	eShop	50.5	131	20	0.38
5,8	eShop	19.3	66	6	0.19	10,4	eShop	39.4	102	12	0.28	19,2	eShop	50.2	131	20	0.38
5,9	eShop	19.2	66	6	0.19	10,5	eShop	39.3	102	12	0.28	19,5	eShop	49.8	131	20	0.38
6	eShop	19	66	6	0.19	10,6	eShop	39.1	102	12	0.28	19,8	eShop	49.3	131	20	0.38
6,1	eShop	24.9	79	8	0.22	10,7	eShop	39	102	12	0.28	20	eShop	49	131	20	0.38
6,2	eShop	24.7	79	8	0.22	10,8	eShop	38.8	102	12	0.28						
6,3	eShop	24.6	79	8	0.22	10,9	eShop	38.7	102	12	0.28						



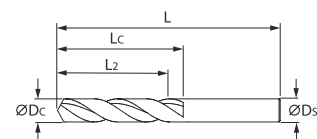
Garant GARANT Master Steel Speed solid carbide drill

Developed for use with **very high cutting speeds**. Outstandingly suitable for machines with **low power output** and high speeds.

- Clear reduction in cutting forces due to special cutter geometry.
- Coating for best wear resistance even at high process temperatures.
- Polished flutes for good chip clearance.

A **slim chisel edge** and the **special arrangement of the 4 guide chamfers** ensure **high positioning and alignment accuracy**. Optimised micro-geometry for increased working life and performance capability.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Versions HB and HE supplied at the same price as HA.
Form **HB**: state **No.122426** on the order.
Form **HE**: order with **No.122425 + 129100HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
12 2425				220	200	180	90							75		160	130						

Ø D _c h7	TiE 12 2425	L ₂	L	Ø D _s	f	Ø D _c h7	TiE 12 2425	L ₂	L	Ø D _s	f	Ø D _c h7	TiE 12 2425	L ₂	L	Ø D _s	f
mm	GARANT Master Steel Speed solid carbide drill, plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.	mm	GARANT Master Steel Speed solid carbide drill, plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.	mm	GARANT Master Steel Speed solid carbide drill, plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.
2	eShop	17	55	4	0.09	6,1	eShop	24.9	79	8	0.22	10,4	eShop	10.4	102	12	0.28
2,05	eShop	16.9	55	4	0.09	6,2	eShop	24.7	79	8	0.22	10,5	eShop	39.3	102	12	0.28
2,1	eShop	16.9	55	4	0.09	6,3	eShop	24.6	79	8	0.22	10,6	eShop	39.1	102	12	0.28
2,2	eShop	16.7	55	4	0.09	6,4	eShop	24.4	79	8	0.22	10,7	eShop	39	102	12	0.28
2,3	eShop	16.6	55	4	0.09	6,5	eShop	24.3	79	8	0.22	10,8	eShop	38.8	102	12	0.28
2,4	eShop	16.4	55	4	0.09	6,6	eShop	24.3	79	8	0.22	11	eShop	38.5	102	12	0.28
2,5	eShop	16.3	55	4	0.09	6,7	eShop	24	79	8	0.22	11,1	eShop	38.4	102	12	0.28
2,6	eShop	16.1	55	4	0.09	6,8	eShop	23.8	79	8	0.22	11,2	eShop	38.2	102	12	0.28
2,7	eShop	16	55	4	0.09	6,9	eShop	23.7	79	8	0.22	11,5	eShop	37.8	102	12	0.28
2,8	eShop	15.8	55	4	0.09	7	eShop	23.5	79	8	0.22	11,6	eShop	37.6	102	12	0.28
2,9	eShop	15.7	55	4	0.09	7,1	eShop	30.4	79	8	0.22	11,7	eShop	37.5	102	12	0.28
3	eShop	15.5	62	6	0.12	7,2	eShop	30.2	79	8	0.22	11,8	eShop	37.3	102	12	0.28
3,1	eShop	15.4	62	6	0.12	7,3	eShop	30.1	79	8	0.22	11,9	eShop	37.2	102	12	0.28
3,2	eShop	15.2	62	6	0.12	7,4	eShop	29.9	79	8	0.22	12	eShop	37	102	12	0.28
3,3	eShop	15.1	62	6	0.12	7,45	eShop	29.9	79	8	0.22	12,2	eShop	41.7	107	14	0.31
3,4	eShop	14.9	62	6	0.12	7,5	eShop	29.8	79	8	0.22	12,5	eShop	41.3	107	14	0.31
3,5	eShop	14.8	62	6	0.12	7,6	eShop	29.6	79	8	0.22	12,8	eShop	40.8	107	14	0.31
3,6	eShop	14.6	62	6	0.12	7,7	eShop	29.5	79	8	0.22	13	eShop	40.5	107	14	0.31
3,7	eShop	14.5	62	6	0.12	7,8	eShop	29.3	79	8	0.22	13,2	eShop	40.2	107	14	0.31
3,8	eShop	18.3	66	6	0.12	7,9	eShop	29.2	79	8	0.22	13,5	eShop	39.8	107	14	0.31
3,9	eShop	18.2	66	6	0.12	8	eShop	29	79	8	0.22	14	eShop	39	107	14	0.31
4	eShop	18	66	6	0.12	8,1	eShop	34.9	89	10	0.26	14,2	eShop	43.7	115	16	0.34
4,1	eShop	17.9	66	6	0.16	8,2	eShop	34.7	89	10	0.26	14,5	eShop	43.7	115	16	0.34
4,2	eShop	17.7	66	6	0.16	8,3	eShop	34.6	89	10	0.26	14,8	eShop	42.8	115	16	0.34
4,3	eShop	17.6	66	6	0.16	8,4	eShop	34.4	89	10	0.26	15	eShop	42.5	115	16	0.34
4,4	eShop	17.4	66	6	0.16	8,5	eShop	34.3	89	10	0.26	15,2	eShop	42.2	115	16	0.34
4,5	eShop	17.3	66	6	0.16	8,6	eShop	34.1	89	10	0.26	15,5	eShop	41.8	115	16	0.34
4,6	eShop	17.1	66	6	0.16	8,7	eShop	34	89	10	0.26	15,8	eShop	41.3	115	16	0.34
4,65	eShop	17.1	66	6	0.16	8,8	eShop	33.8	89	10	0.26	16	eShop	41	115	16	0.34
4,7	eShop	17	66	6	0.16	8,9	eShop	33.7	89	10	0.26	16,2	eShop	48.7	123	18	0.35
4,8	eShop	20.8	66	6	0.16	9	eShop	33.5	89	10	0.26	16,5	eShop	48.3	123	18	0.35
4,9	eShop	20.7	66	6	0.16	9,1	eShop	33.4	89	10	0.26	16,8	eShop	47.8	123	18	0.35
5	eShop	20.5	66	6	0.16	9,2	eShop	33.2	89	10	0.26	17	eShop	47.5	123	18	0.35
5,1	eShop	20.4	66	6	0.19	9,3	eShop	33.1	89	10	0.26	17,2	eShop	47.2	123	18	0.35
5,2	eShop	20.2	66	6	0.19	9,4	eShop	32.9	89	10	0.26	17,5	eShop	46.8	123	18	0.35
5,3	eShop	20.1	66	6	0.19	9,5	eShop	32.8	89	10	0.26	17,8	eShop	46.8	123	18	0.35
5,4	eShop	19.9	66	6	0.19	9,6	eShop	32.6	89	10	0.26	18	eShop	46	123	18	0.35
5,5	eShop	19.8	66	6	0.19	9,7	eShop	32.5	89	10	0.26	18,2	eShop	51.7	131	20	0.38
5,55	eShop	19.7	66	6	0.19	9,8	eShop	32.3	89	10	0.26	18,5	eShop	51.3	131	20	0.38
5,6	eShop	19.6	66	6	0.19	9,9	eShop	32.2	89	10	0.26	19	eShop	50.5	131	20	0.38
5,7	eShop	19.5	66	6	0.19	10	eShop	32	89	10	0.26	19,5	eShop	49.8	131	20	0.38
5,8	eShop	19.3	66	6	0.19	10,1	eShop	39.9	102	12	0.28	19,8	eShop	49.3	131	20	0.38
5,9	eShop	19.2	66	6	0.19	10,2	eShop	39.7	102	12	0.28	20	eShop	49	131	20	0.38
6	eShop	19	66	6	0.19	10,3	eShop	39.6	102	12	0.28						

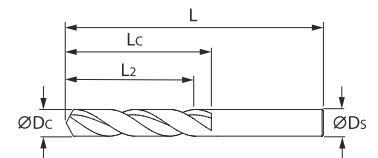
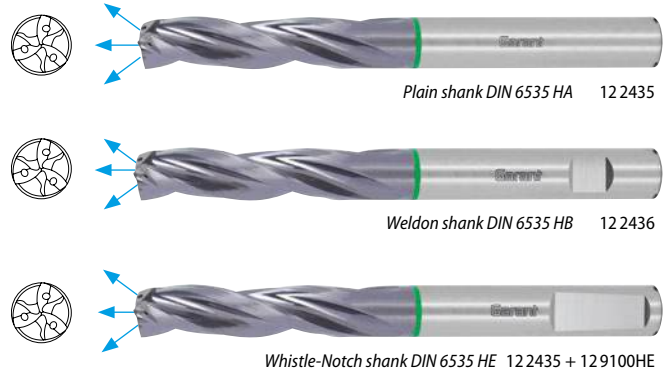


GARANT Master Steel Feed solid carbide drill

3-flute drill, specially developed for **use at very high feed rates**. Extremely suitable for **machines with high power** output and stable machining conditions.

- Special point geometry with stable cutting edges and large clearance at the centre permits very high feed rates.
- The patented point geometry is optimised for chip flow and generates low cutting forces with good chip breakage.
- With 145° point angle for low burr formation when drilling through holes. The **sector-leading technology of the chisel point** guarantees **optimum self-centring behaviour** and permits spot drilling on irregular surfaces. 3 guide chamfers guarantee a stable exit from the hole and an exact roundness of the hole.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and HE shanks are available at the same price as HA.
For **HB shanks**: use order **No. 122436**.
For **HE shanks**: use order **No. 122435 + 129100HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	K						
12 2435				160	140	130	110	90	60				60	50	40	130	80						

Ø D _c h7	12 2435	L ₂	L	Ø D _s	f
	GARANT Master Steel Feed solid carbide drill, plain shank				< 1100 N
	DIN 6535 HA				
(mm or inch)	TiAlN	mm	mm	mm	mm/rev.
4	eShop	18	66	6	0.28
4,1	eShop	17,9	66	6	0.28
4,2	eShop	17,7	66	6	0.28
4,3	eShop	17,6	66	6	0.28
4,4	eShop	17,4	66	6	0.28
4,5	eShop	17,3	66	6	0.28
4,6	eShop	17,1	66	6	0.28
4,65	eShop	17,1	66	6	0.28
4,7	eShop	17	66	6	0.28
3/16	eShop	17	66	6	0.28
4,8	eShop	20,8	66	6	0.28
4,9	eShop	20,7	66	6	0.28
5	eShop	20,5	66	6	0.28
5,1	eShop	20,4	66	6	0.32
5,2	eShop	20,2	66	6	0.32
5,3	eShop	20,1	66	6	0.32
5,4	eShop	19,9	66	6	0.32
5,5	eShop	19,8	66	6	0.32
5,55	eShop	19,7	66	6	0.32
7/32	eShop	19,7	66	6	0.32
5,6	eShop	19,6	66	6	0.32
5,7	eShop	19,5	66	6	0.32
5,8	eShop	19,3	66	6	0.32
5,9	eShop	19,2	66	6	0.32
6	eShop	19	66	6	0.32
6,1	eShop	24,9	79	8	0.37
6,2	eShop	24,7	79	8	0.37
6,3	eShop	24,6	79	8	0.37
1/4	eShop	24,6	79	8	0.37
6,35	eShop	24,5	79	8	0.37
6,4	eShop	24,4	79	8	0.37
6,5	eShop	24,3	79	8	0.37
6,6	eShop	24,1	79	8	0.37
6,7	eShop	24	79	8	0.37
6,8	eShop	23,8	79	8	0.37
6,9	eShop	23,7	79	8	0.37
7	eShop	23,5	79	8	0.37
7,1	eShop	30,4	79	8	0.37
9/32	eShop	30,4	79	8	0.37
7,2	eShop	30,2	79	8	0.37
7,3	eShop	30,1	79	8	0.37
7,4	eShop	29,9	79	8	0.37
7,45	eShop	29,9	79	8	0.37
7,5	eShop	29,8	79	8	0.37

Ø D _c h7	12 2435	L ₂	L	Ø D _s	f
	GARANT Master Steel Feed solid carbide drill, plain shank				< 1100 N
	DIN 6535 HA				
(mm or inch)	TiAlN	mm	mm	mm	mm/rev.
7,6	eShop	29,6	79	8	0.37
7,7	eShop	29,5	79	8	0.37
7,8	eShop	29,3	79	8	0.37
7,9	eShop	29,2	79	8	0.37
5/16	eShop	29,2	79	8	0.37
8	eShop	29	79	8	0.37
8,1	eShop	34,9	89	10	0.44
8,2	eShop	34,7	89	10	0.44
8,3	eShop	34,6	89	10	0.44
8,4	eShop	34,4	89	10	0.44
8,5	eShop	34,3	89	10	0.44
8,6	eShop	34,1	89	10	0.44
8,7	eShop	34	89	10	0.44
11/32	eShop	34	89	10	0.44
8,8	eShop	33,8	89	10	0.44
8,9	eShop	33,7	89	10	0.44
9	eShop	33,5	89	10	0.44
9,1	eShop	33,4	89	10	0.44
9,2	eShop	33,2	89	10	0.44
9,3	eShop	33,1	89	10	0.44
9,35	eShop	32,9	89	10	0.44
9,4	eShop	32,9	89	10	0.44
9,5	eShop	32,8	89	10	0.44
3/8	eShop	32,8	89	10	0.44
9,6	eShop	32,6	89	10	0.44
9,7	eShop	32,5	89	10	0.44
9,8	eShop	32,3	89	10	0.44
9,9	eShop	32,2	89	10	0.44
10	eShop	32	89	10	0.44
10,1	eShop	39,9	102	12	0.5
10,2	eShop	39,7	102	12	0.5
10,3	eShop	39,6	102	12	0.5
13/32	eShop	39,6	102	12	0.5
10,4	eShop	39,4	102	12	0.5
10,5	eShop	39,3	102	12	0.5
10,6	eShop	39,1	102	12	0.5
10,7	eShop	39	102	12	0.5
10,8	eShop	38,8	102	12	0.5
10,9	eShop	38,7	102	12	0.5
11	eShop	38,5	102	12	0.5
11,1	eShop	38,4	102	12	0.5
7/16	eShop	38,4	102	12	0.5
11,2	eShop	38,2	102	12	0.5
11,3	eShop	38,1	102	12	0.5

Ø D _c h7	12 2435	L ₂	L	Ø D _s	f
	GARANT Master Steel Feed solid carbide drill, plain shank				< 1100 N
	DIN 6535 HA				
(mm or inch)	TiAlN	mm	mm	mm	mm/rev.
11,4	eShop	37,9	102	12	0.5
11,5	eShop	37,8	102	12	0.5
11,6	eShop	37,6	102	12	0.5
11,7	eShop	37,5	102	12	0.5
11,8	eShop	37,3	102	12	0.5
11,9	eShop	37,2	102	12	0.5
12	eShop	37	102	12	0.5
12,2	eShop	41,7	107	14	0.56
12,5	eShop	41,3	107	14	0.56
1/2	eShop	41,3	107	14	0.56
12,7	eShop	40,95	107	14	0.56
12,8	eShop	40,8	107	14	0.56
13	eShop	40,5	107	14	0.56
13,2	eShop	40,2	107	14	0.56
13,5	eShop	39,8	107	14	0.56
13,8	eShop	39,3	107	14	0.56
14	eShop	39	107	14	0.56
14,2	eShop	43,7	115	16	0.61
9/16	eShop	43,7	115	16	0.61
14,5	eShop	43,3	115	16	0.61
14,8	eShop	42,8	115	16	0.61
15	eShop	42,5	115	16	0.61
15,2	eShop	42,2	115	16	0.61
15,5	eShop	41,8	115	16	0.61
15,8	eShop	41,3	115	16	0.61
5/8	eShop	41,3	115	16	0.61
16	eShop	41	115	16	0.61
16,2	eShop	48,7	123	18	0.66
16,5	eShop	48,3	123	18	0.66
16,8	eShop	47,8	123	18	0.66
17	eShop	47,5	123	18	0.66
17,2	eShop	47,2	123	18	0.66
17,5	eShop	46,8	123	18	0.66
17,8	eShop	46,3	123	18	0.66
18	eShop	46	123	18	0.66
18,2	eShop	51,7	131	20	0.69
18,5	eShop	51,3	131	20	0.69
18,8	eShop	50,8	131	20	0.69
19	eShop	50,5	131	20	0.69
19,2	eShop	50,2	131	20	0.69
19,5	eShop	49,8	131	20	0.69
19,8	eShop	49,3	131	20	0.69
20	eShop	49	131	20	0.69

Garant MASTER STEEL

MASTERFUL PERFORMANCE IN STEEL

The latest technology meets the tried-and-tested sturdiness and reliability of a convex cutting edge.

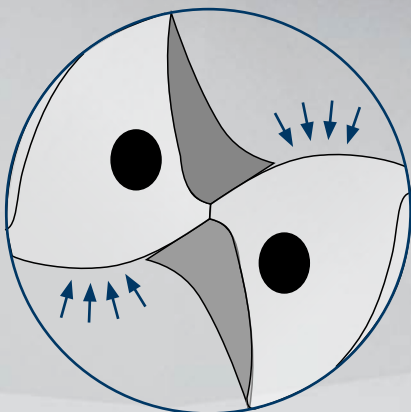
Unique and patented combination of face geometry and TiAlN special coating – optimised for steel applications.

Sturdy drill body for higher feed rates.

Convex cutting edge for maximum robustness – even in steel materials with a tensile strength of up to 1400 N.

Relieved cone for even sturdier cutting edge.

Optimised flute geometry for reliable chip evacuation.



P

K

Garant



The initial portfolio

- Diameter range:
3 mm* to 20 mm.
- Types:
 - 4xD without internal cooling (12 2470)
 - 4xD with internal cooling (12 2475)
 - 6xD with internal cooling (12 2761)
 - 8xD with internal cooling (12 3040)
 - 12xD with internal cooling (12 3240)
- Convenient tool upgrade
as the **dimensions**
and **list price are the same**
as the old tool!

Advantages

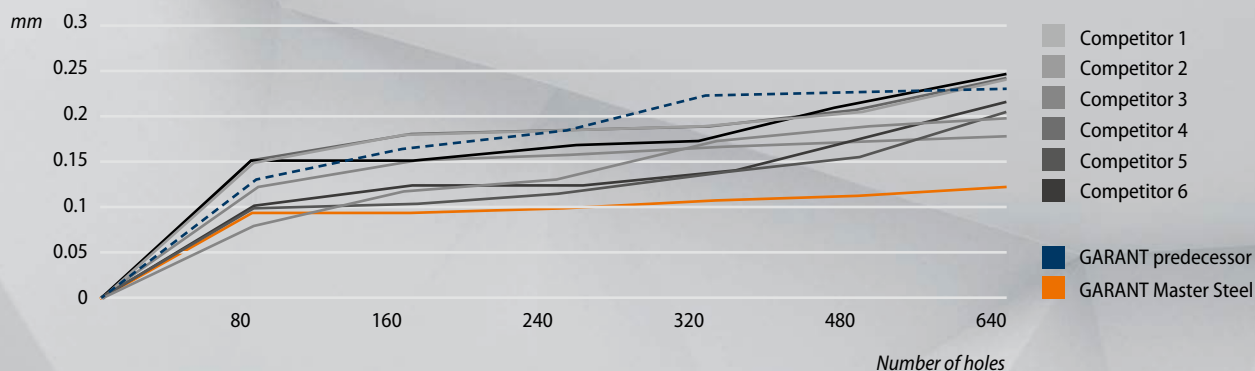
- Up to **200% longer tool life**
in comparison with the competition.
- Up to **50% longer tool life**
compared with the previous product.

... and with up to
30% higher metal removal rate!



12

Development of wear in 1.2379 up to 640 holes



Garant MASTER STEEL MICRO



* Use the GARANT Master Steel Micro solid carbide micro-drill (see pages 83 – 86)
for efficient machining of steel in diameters ranging from 0.8 mm to 3 mm.



GARANT Master Steel solid carbide high-performance drill

Robust drill design and optimised special point geometry for the **best possible chip formation and reliable chip breakage** with **higher feed rates at the same time**. **Advanced micro-geometry, convex cutting edge** and **relieved coneto** provide additional stability for the main cutting edge. **Optimised flute geometry and patented face geometry for reliable chip evacuation** in steel materials and cast material. **High-performance coating** of the latest generation.

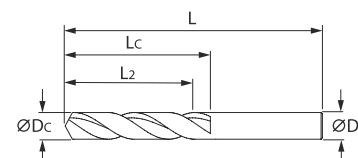
Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and HE shanks are available at the same price as HA.
HB shank: order with No. 122471 / 122476.
HE shank: order with No. 122470 / 122475 and 129100HE.



Plain shank DIN 6535HA 12 2470



Plain shank DIN 6535HA 12 2475



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG < 110	GGG < 130	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
12 2470				115	105	100	70	60								110	75						
12 2475				170	155	145	130	110	60					55	45	130	90						

Ø D _c h7	12 2470	12 2475	L ₂	L	Ø D _s	f
	GARANT Master Steel solid carbide HPC drill, plain shank					
	DIN 6535 HA					
mm	TiAlN	TiAlN	mm	mm	mm	mm/rev.
1	eShop	—	5.5	45	4	0.05
1,1	eShop	—	5.4	45	4	0.05
1,2	eShop	—	5.2	45	4	0.06
1,3	eShop	—	5.1	45	4	0.06
1,4	eShop	—	4.9	45	4	0.06
1,5	eShop	—	11.8	55	4	0.07
1,6	eShop	—	11.6	55	4	0.07
1,7	eShop	—	11.5	55	4	0.07
1,8	eShop	—	11.3	55	4	0.08
1,9	eShop	—	11.2	55	4	0.08
2	eShop	—	17	55	4	0.08
2,1	eShop	—	16.9	55	4	0.09
2,2	eShop	—	16.7	55	4	0.09
2,3	eShop	—	16.6	55	4	0.09
2,4	eShop	—	16.4	55	4	0.1
2,5	eShop	—	16.3	55	4	0.1
2,6	eShop	—	16.1	55	4	0.1
2,7	eShop	—	16	55	4	0.11
2,8	eShop	—	15.8	55	4	0.11
2,9	eShop	—	15.7	55	4	0.11
3	eShop	eShop	15.5	62	6	0.12
3,1	eShop	eShop	15.4	62	6	0.12
3,2	eShop	eShop	15.2	62	6	0.12
3,3	eShop	eShop	15.1	62	6	0.13
3,4	eShop	eShop	14.9	62	6	0.13
3,5	eShop	eShop	14.8	62	6	0.13
3,6	eShop	—	14.6	62	6	0.14
3,7	eShop	eShop	14.5	62	6	0.14
3,8	eShop	eShop	18.3	66	6	0.14
3,9	eShop	eShop	18.2	66	6	0.15
4	eShop	eShop	18	66	6	0.15
4,1	eShop	eShop	17.9	66	6	0.15
4,2	eShop	eShop	17.7	66	6	0.16
4,3	eShop	eShop	17.6	66	6	0.16
4,4	eShop	—	17.4	66	6	0.16
4,5	eShop	eShop	17.3	66	6	0.16
4,6	eShop	—	17.1	66	6	0.17
4,8	eShop	eShop	20.8	66	6	0.17
4,9	eShop	—	20.7	66	6	0.18
5	eShop	eShop	20.5	66	6	0.18
5,1	eShop	eShop	20.4	66	6	0.18
5,2	eShop	eShop	20.2	66	6	0.18
5,3	eShop	eShop	20.1	66	6	0.19
5,4	eShop	—	19.9	66	6	0.19
5,5	eShop	eShop	19.8	66	6	0.19
5,6	eShop	—	19.6	66	6	0.2
5,7	eShop	eShop	19.5	66	6	0.2
5,8	eShop	eShop	19.3	66	6	0.2
5,9	eShop	—	19.2	66	6	0.2
6	eShop	eShop	19	66	6	0.21
6,1	eShop	—	24.9	79	8	0.21
6,2	eShop	eShop	24.7	79	8	0.21
6,3	eShop	eShop	24.6	79	8	0.22
6,4	eShop	—	24.4	79	8	0.22

Ø D _c h7	12 2470	12 2475	L ₂	L	Ø D _s	f
	GARANT Master Steel solid carbide HPC drill, plain shank					
	DIN 6535 HA					
mm	TiAlN	TiAlN	mm	mm	mm	mm/rev.
6,5	eShop	eShop	24.3	79	8	0.22
6,6	eShop	—	24.1	79	8	0.22
6,8	eShop	eShop	23.8	79	8	0.23
6,9	eShop	eShop	23.7	79	8	0.23
7	eShop	eShop	23.5	79	8	0.23
7,1	eShop	—	30.4	79	8	0.24
7,2	eShop	eShop	30.2	79	8	0.24
7,3	eShop	eShop	30.1	79	8	0.24
7,5	eShop	eShop	29.8	79	8	0.25
7,8	eShop	eShop	29.3	79	8	0.25
7,9	eShop	—	29.2	79	8	0.26
8	eShop	eShop	29	79	8	0.26
8,1	eShop	eShop	34.9	89	10	0.26
8,2	eShop	eShop	34.7	89	10	0.26
8,3	eShop	eShop	34.6	89	10	0.27
8,4	eShop	—	34.4	89	10	0.27
8,5	eShop	eShop	34.3	89	10	0.27
8,6	eShop	—	34.1	89	10	0.27
8,7	eShop	—	34	89	10	0.28
8,8	eShop	eShop	33.8	89	10	0.28
9	eShop	eShop	33.5	89	10	0.28
9,1	eShop	—	33.4	89	10	0.29
9,2	eShop	eShop	33.2	89	10	0.29
9,3	eShop	eShop	33.1	89	10	0.29
9,5	eShop	eShop	32.8	89	10	0.29
9,8	eShop	eShop	32.3	89	10	0.3
10	eShop	eShop	32	89	10	0.3
10,2	eShop	eShop	39.7	102	12	0.31
10,3	eShop	eShop	39.6	102	12	0.31
10,5	eShop	eShop	39.3	102	12	0.32
10,8	eShop	eShop	38.8	102	12	0.32
11	eShop	eShop	38.5	102	12	0.33
11,2	eShop	eShop	38.2	102	12	0.33
11,5	eShop	eShop	37.8	102	12	0.33
11,8	eShop	eShop	37.3	102	12	0.34
12	eShop	eShop	37	102	12	0.34
12,2	eShop	eShop	41.7	107	14	0.35
12,5	eShop	eShop	41.3	107	14	0.35
13	eShop	eShop	40.5	107	14	0.36
13,5	eShop	eShop	39.8	107	14	0.37
14	eShop	eShop	39	107	14	0.38
14,2	eShop	eShop	43.7	115	16	0.38
14,5	eShop	eShop	43.3	115	16	0.38
15	eShop	eShop	42.5	115	16	0.39
15,5	eShop	eShop	41.8	115	16	0.4
16	eShop	eShop	41	115	16	0.4
16,5	eShop	eShop	48.3	123	18	0.41
17	eShop	eShop	47.5	123	18	0.41
17,5	eShop	eShop	46.8	123	18	0.42
18	eShop	eShop	46	123	18	0.42
18,5	eShop	eShop	51.3	131	20	0.43
19	eShop	eShop	50.5	131	20	0.43
19,5	eShop	eShop	49.8	131	20	0.43
20	eShop	eShop	49	131	20	0.44



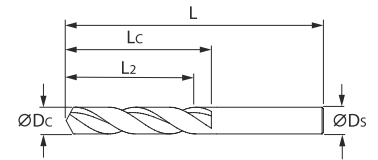
HOLEX Pro Steel solid carbide high-performance drill

Straight major cutting edges and a **special flute profile** ensure a good chip evacuation. The robust cutter geometry ensures high-performance drilling with good process reliability.

A wide range of applications in steel materials thanks to a combination of tough ultra-fine grain carbide and an extremely wear-resistant coating.

Up to Ø 1.9 with 4 facets, from Ø 2 with relieved cone.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Versions with HB and HE shank available at the same price as HA.
For **HB shanks**: use order no. **122502**.
For **HE shanks**: use order no. **122503**.



Plain shank DIN 6535 HA 12 2501



Weldon shank DIN 6535 HB 12 2502



Whistle-Notch shank DIN 6535 HE 12 2503

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG < 900 N	GGG < 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
12 2501				115	105	85	80	60						30	25	90	55						

Ø D _c h7	12F	12 2501	L ₂	L	Ø D _s	f
(mm or inch)		HOLEX Pro Steel solid carbide drill, plain shank				
		DIN 6535 HA				
		TiAlN	mm	mm	mm	mm/rev.
1		eShop	4.5	45	4	0.05
1,1		eShop	4.9	45	4	0.05
1,2		eShop	5.2	45	4	0.05
1,3		eShop	6.1	45	4	0.05
1,4		eShop	6.4	45	4	0.05
1,5		eShop	6.8	50	4	0.05
1/16		eShop	7.1	50	4	0.05
1,6		eShop	7.1	50	4	0.05
1,7		eShop	7.5	50	4	0.07
1,8		eShop	8.3	50	4	0.07
1,9		eShop	8.7	50	4	0.07
2		eShop	9	50	4	0.07
2,1		eShop	9.4	55	4	0.07
2,2		eShop	9.7	55	4	0.07
2,3		eShop	10.6	55	4	0.09
3/32		eShop	10.9	55	4	0.09
2,4		eShop	10.9	55	4	0.09
2,5		eShop	11.3	55	4	0.09
2,6		eShop	11.6	55	4	0.09
2,7		eShop	12	55	4	0.11
2,8		eShop	12.8	55	4	0.11
2,9		eShop	13.2	55	4	0.11
3		eShop	15.5	62	6	0.11
3,1		eShop	15.4	62	6	0.11
1/8		eShop	15.3	62	6	0.11
3,2		eShop	15.2	62	6	0.11
3,3		eShop	15.1	62	6	0.11
3,4		eShop	14.9	62	6	0.11
3,5		eShop	14.8	62	6	0.11
3,6		eShop	14.6	62	6	0.11

Ø D _c h7	12F	12 2501	L ₂	L	Ø D _s	f
(mm or inch)		HOLEX Pro Steel solid carbide drill, plain shank				
		DIN 6535 HA				
		TiAlN	mm	mm	mm	mm/rev.
3,7		eShop	14.5	62	6	0.11
3,8		eShop	18.3	66	6	0.11
W/L-25		eShop	18.3	66	6	0.11
3,9		eShop	18.2	66	6	0.11
5/32		eShop	18.5	66	6	0.11
4		eShop	18	66	6	0.14
4,1		eShop	17.9	66	6	0.14
4,2		eShop	17.7	66	6	0.14
4,3		eShop	17.6	66	6	0.14
4,4		eShop	17.4	66	6	0.14
4,5		eShop	17.3	66	6	0.14
W/L-16		eShop	17.3	66	6	0.14
4,6		eShop	17.1	66	6	0.14
4,7		eShop	17	66	6	0.14
3/16		eShop	20.9	66	6	0.14
4,8		eShop	20.8	66	6	0.14
4,9		eShop	20.7	66	6	0.14
5		eShop	20.5	66	6	0.14
5,1		eShop	20.4	66	6	0.14
5,2		eShop	20.2	66	6	0.14
5,3		eShop	20.1	66	6	0.14
5,4		eShop	19.9	66	6	0.14
5,5		eShop	19.8	66	6	0.14
7/32		eShop	19.7	66	6	0.14
5,6		eShop	19.6	66	6	0.14
5,7		eShop	19.5	66	6	0.14
5,8		eShop	19.3	66	6	0.14
5,9		eShop	19.2	66	6	0.14
6		eShop	19	66	6	0.14
6,1		eShop	24.9	79	8	0.18

$\varnothing D_c$ h7	12F 12 2501	L_2	L	$\varnothing D_s$	 f
	HOLEX Pro Steel solid carbide drill, plain shank				
(mm or inch)	DIN 6535 HA				
	TiAIN	mm	mm	mm	mm/rev.
W/L-C	eShop	24.8	79	8	0.18
6,15	eShop	24.8	79	8	0.18
6,2	eShop	24.7	79	8	0.18
6,3	eShop	24.6	79	8	0.18
1/4	eShop	24.5	79	8	0.18
6,35	eShop	24.5	79	8	0.18
6,4	eShop	24.4	79	8	0.18
6,5	eShop	24.3	79	8	0.18
6,6	eShop	24.1	79	8	0.18
6,7	eShop	24	79	8	0.18
6,8	eShop	23.8	79	8	0.18
6,9	eShop	23.7	79	8	0.18
7	eShop	23.5	79	8	0.18
7,1	eShop	30.4	79	8	0.18
9/32	eShop	30.3	79	8	0.18
7,2	eShop	30.2	79	8	0.18
7,3	eShop	30.1	79	8	0.18
7,4	eShop	29.9	79	8	0.18
7,5	eShop	29.8	79	8	0.18
7,6	eShop	29.6	79	8	0.18
7,7	eShop	29.5	79	8	0.18
7,8	eShop	29.3	79	8	0.18
7,9	eShop	29.2	79	8	0.18
5/16	eShop	29.1	79	8	0.18
8	eShop	29	79	8	0.18
8,1	eShop	34.9	89	10	0.2
8,2	eShop	34.7	89	10	0.2
8,3	eShop	34.6	89	10	0.2
8,4	eShop	34.4	89	10	0.2
8,5	eShop	34.3	89	10	0.2
8,6	eShop	34.1	89	10	0.2
8,7	eShop	34	89	10	0.2
11/32	eShop	33.9	89	10	0.2
8,8	eShop	33.8	89	10	0.2
8,9	eShop	33.7	89	10	0.2
9	eShop	33.5	89	10	0.2
9,1	eShop	33.4	89	10	0.22
9,2	eShop	33.2	89	10	0.22
9,3	eShop	33.1	89	10	0.22
9,4	eShop	32.9	89	10	0.22
9,5	eShop	32.8	89	10	0.22
3/8	eShop	32.7	89	10	0.22
9,6	eShop	32.6	89	10	0.22
9,7	eShop	32.5	89	10	0.22
9,8	eShop	32.3	89	10	0.22
9,9	eShop	32.2	89	10	0.22
10	eShop	32	89	10	0.22
10,1	eShop	39.9	102	12	0.22
10,2	eShop	39.7	102	12	0.22
10,3	eShop	39.6	102	12	0.22
13/32	eShop	39.5	102	12	0.22
10,4	eShop	39.4	102	12	0.22
10,5	eShop	39.3	102	12	0.22
10,6	eShop	39.1	102	12	0.22
10,7	eShop	39	102	12	0.22
10,8	eShop	38.8	102	12	0.22
10,9	eShop	38.7	102	12	0.22

$\varnothing D_c$ h7	12F 12 2501	L_2	L	$\varnothing D_s$	 f
	HOLEX Pro Steel solid carbide drill, plain shank				
(mm or inch)	DIN 6535 HA				
	TiAIN	mm	mm	mm	mm/rev.
11	eShop	38.5	102	12	0.22
11,1	eShop	38.4	102	12	0.22
7/16	eShop	38.3	102	12	0.22
11,2	eShop	38.2	102	12	0.22
11,3	eShop	38.1	102	12	0.22
11,4	eShop	37.9	102	12	0.22
11,5	eShop	37.8	102	12	0.22
11,6	eShop	37.6	102	12	0.22
11,7	eShop	37.5	102	12	0.22
11,8	eShop	37.3	102	12	0.22
11,9	eShop	37.2	102	12	0.22
12	eShop	37	102	12	0.22
12,2	eShop	41.7	107	14	0.26
12,5	eShop	41.3	107	14	0.26
1/2	eShop	40.1	107	14	0.26
12,7	eShop	40.1	107	14	0.26
12,8	eShop	40.8	107	14	0.26
13	eShop	40.5	107	14	0.26
13,2	eShop	40.2	107	14	0.26
13,5	eShop	39.8	107	14	0.26
13,8	eShop	39.3	107	14	0.26
14	eShop	39	107	14	0.26
14,2	eShop	43.7	115	16	0.26
9/16	eShop	43.6	115	16	0.26
14,5	eShop	43.3	115	16	0.26
14,8	eShop	42.8	115	16	0.26
15	eShop	42.5	115	16	0.26
19/32	eShop	42.4	115	16	0.26
15,1	eShop	42.4	115	16	0.26
15,2	eShop	42.2	115	16	0.26
15,5	eShop	41.8	115	16	0.26
15,8	eShop	41.3	115	16	0.26
5/8	eShop	41.2	115	16	0.26
16	eShop	41	115	16	0.26
16,2	eShop	48.7	123	18	0.28
16,5	eShop	48.3	123	18	0.28
21/32	eShop	48	123	18	0.28
16,8	eShop	47.8	123	18	0.28
17	eShop	47.5	123	18	0.28
17,2	eShop	47.2	123	18	0.28
17,3	eShop	47.2	123	18	0.28
11/16	eShop	46.8	123	18	0.28
17,5	eShop	46.8	123	18	0.28
17,7	eShop	46.5	123	18	0.28
17,8	eShop	46.3	123	18	0.28
18	eShop	46	123	18	0.28
18,2	eShop	51.7	131	20	0.28
18,5	eShop	51.3	131	20	0.28
18,8	eShop	50.8	131	20	0.28
19	eShop	50.5	131	20	0.28
3/4	eShop	50.4	131	20	0.28
19,05	eShop	50.4	131	20	0.28
19,2	eShop	50.2	131	20	0.28
19,3	eShop	50.2	131	20	0.28
19,5	eShop	49.8	131	20	0.28
19,8	eShop	49.3	131	20	0.28
20	eShop	49	131	20	0.28



HOLEX Pro Steel solid carbide high-performance drill

Straight major cutting edges and a **special flute profile** ensure good chip evacuation. The robust cutter geometry ensures high-performance drilling with good process reliability.

A wide range of applications in steel materials thanks to a combination of tough ultra-fine grain carbide and an extremely wear-resistant coating.

Up to Ø 1.9 with 4 facets, from Ø 2 with relieved cone.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Versions with HB and HE shank available at the same price as HA.
For **HB shanks**: use order no. **122507**.
For **HE shanks**: use order no. **122508**.



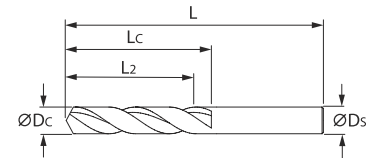
Plain shank DIN 6535 HA 12 2504



Weldon shank DIN 6535 HB 12 2507



Whistle-Notch shank DIN 6535 HE 12 2508



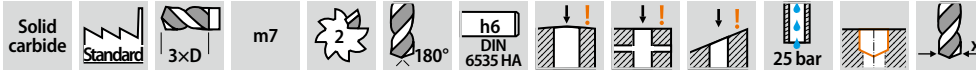
Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG < 900 N	GGG < 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
12 2504	250	200	160	125	115	95	90	65						35	30	100	65						

Ø D _c h7	12 2504	L ₂	L	Ø D _s	f
	HOLEX Pro Steel solid carbide drill, plain shank				
	DIN 6535 HA				
(mm or inch)	TIAlN	mm	mm	mm	mm/rev.
1	eShop	4.5	45	4	0.05
1,1	eShop	4.9	45	4	0.05
1,2	eShop	5.2	45	4	0.05
1,3	eShop	6.1	45	4	0.05
1,4	eShop	6.4	45	4	0.05
1,5	eShop	6.8	50	4	0.05
1/16	eShop	7.1	50	4	0.05
1,6	eShop	7.1	50	4	0.05
1,7	eShop	7.5	50	4	0.07
1,8	eShop	8.3	50	4	0.07
1,9	eShop	8.7	50	4	0.07
2	eShop	9	50	4	0.07
2,1	eShop	9.4	55	4	0.07
2,2	eShop	9.7	55	4	0.07
2,3	eShop	10.6	55	4	0.09
3/32	eShop	10.9	55	4	0.09
2,4	eShop	10.9	55	4	0.09
2,5	eShop	11.3	55	4	0.09
2,6	eShop	11.6	55	4	0.09
2,7	eShop	12	55	4	0.09
2,8	eShop	12.8	55	4	0.11
2,9	eShop	13.2	55	4	0.11
3	eShop	15.5	62	6	0.11
3,1	eShop	15.4	62	6	0.11
1/8	eShop	15.4	62	6	0.11
3,2	eShop	15.2	62	6	0.11
3,3	eShop	15.1	62	6	0.11

Ø D _c h7	12 2504	L ₂	L	Ø D _s	f
	HOLEX Pro Steel solid carbide drill, plain shank				
	DIN 6535 HA				
(mm or inch)	TIAlN	mm	mm	mm	mm/rev.
3,4	eShop	14.9	62	6	0.11
3,5	eShop	14.8	62	6	0.11
3,6	eShop	14.6	62	6	0.11
3,7	eShop	14.5	62	6	0.11
3,8	eShop	18.3	66	6	0.11
W/L-25	eShop	18.3	66	6	0.11
3,9	eShop	18.2	66	6	0.11
5/32	eShop	18.2	66	6	0.11
4	eShop	18	66	6	0.14
4,1	eShop	17.9	66	6	0.14
4,2	eShop	17.7	66	6	0.14
4,3	eShop	17.6	66	6	0.14
4,4	eShop	17.4	66	6	0.14
4,5	eShop	17.3	66	6	0.14
W/L-16	eShop	17.3	66	6	0.14
4,6	eShop	17.1	66	6	0.14
4,7	eShop	17	66	6	0.14
3/16	eShop	20.8	66	6	0.14
4,8	eShop	20.8	66	6	0.14
4,9	eShop	20.7	66	6	0.14
5	eShop	20.5	66	6	0.14
5,1	eShop	20.4	66	6	0.14
5,2	eShop	20.2	66	6	0.14
5,3	eShop	20.1	66	6	0.14
5,4	eShop	19.9	66	6	0.14
5,5	eShop	19.8	66	6	0.14
7/32	eShop	19.8	66	6	0.14

$\varnothing D_c$ h7	12F 12 2504 HOLEX Pro Steel solid carbide drill, plain shank DIN 6535 HA TiAlN	L ₂	L	$\varnothing D_s$	 f
(mm or inch)		mm	mm	mm	mm/rev.
5,6	eShop	19.6	66	6	0.14
5,7	eShop	19.5	66	6	0.14
5,8	eShop	19.3	66	6	0.14
5,9	eShop	19.2	66	6	0.14
6	eShop	19	66	6	0.14
6,1	eShop	24.9	79	8	0.18
W/L-C	eShop ■	24.9	79	8	0.18
6,15	eShop	24.8	79	8	0.18
6,2	eShop	24.7	79	8	0.18
6,3	eShop	24.6	79	8	0.18
1/4	eShop ■	24.6	79	8	0.18
6,35	eShop	24.8	79	8	0.18
6,4	eShop	24.4	79	8	0.18
6,5	eShop	24.3	79	8	0.18
6,6	eShop	24.1	79	8	0.18
6,7	eShop	24	79	8	0.18
6,8	eShop	23.8	79	8	0.18
6,9	eShop	23.7	79	8	0.18
7	eShop	23.5	79	8	0.18
7,1	eShop	30.4	79	8	0.18
9/32	eShop ■	30.4	79	8	0.18
7,2	eShop	30.2	79	8	0.18
7,3	eShop	30.1	79	8	0.18
7,4	eShop	29.9	79	8	0.18
7,5	eShop	29.8	79	8	0.18
7,6	eShop	29.6	79	8	0.18
7,7	eShop	29.5	79	8	0.18
7,8	eShop	29.3	79	8	0.18
7,9	eShop	29.2	79	8	0.18
5/16	eShop ■	29.2	79	8	0.18
8	eShop	29	79	8	0.18
8,1	eShop	34.9	89	10	0.2
8,2	eShop	34.7	89	10	0.2
8,3	eShop	34.6	89	10	0.2
8,4	eShop	34.4	89	10	0.2
8,5	eShop	34.3	89	10	0.2
8,6	eShop	34.1	89	10	0.2
8,7	eShop	34	89	10	0.2
11/32	eShop ■	34	89	10	0.2
8,8	eShop	33.8	89	10	0.2
8,9	eShop	33.7	89	10	0.2
9	eShop	33.5	89	10	0.2
9,1	eShop	33.4	89	10	0.22
9,2	eShop	33.2	89	10	0.22
9,3	eShop	33.1	89	10	0.22
9,4	eShop	32.9	89	10	0.22
9,5	eShop	32.8	89	10	0.22
3/8	eShop ■	32.8	89	10	0.22
9,6	eShop	32.6	89	10	0.22
9,7	eShop	32.5	89	10	0.22
9,8	eShop	32.3	89	10	0.22
9,9	eShop	32.2	89	10	0.22
10	eShop	32	89	10	0.22
10,1	eShop	39.9	102	12	0.22
10,2	eShop	39.7	102	12	0.22
10,3	eShop	39.6	102	12	0.22
13/32	eShop ■	39.6	102	12	0.22
10,4	eShop	39.4	102	12	0.22
10,5	eShop	39.3	102	12	0.22
10,6	eShop	39.1	102	12	0.22

$\varnothing D_c$ h7	12F 12 2504 HOLEX Pro Steel solid carbide drill, plain shank DIN 6535 HA TiAlN	L ₂	L	$\varnothing D_s$	 f
(mm or inch)		mm	mm	mm	mm/rev.
10,7	eShop	39	102	12	0.22
10,8	eShop	38.8	102	12	0.22
10,9	eShop	38.7	102	12	0.22
11	eShop	38.5	102	12	0.22
11,1	eShop	38.4	102	12	0.22
7/16	eShop ■	38.4	102	12	0.22
11,2	eShop	38.2	102	12	0.22
11,3	eShop	38.1	102	12	0.22
11,4	eShop	37.9	102	12	0.22
11,5	eShop	37.8	102	12	0.22
11,6	eShop	37.6	102	12	0.22
11,7	eShop	37.5	102	12	0.22
11,8	eShop	37.3	102	12	0.22
11,9	eShop	37.2	102	12	0.22
12	eShop	37	102	12	0.22
12,2	eShop	41.7	107	14	0.26
12,5	eShop	41.3	107	14	0.26
1/2	eShop ■	41.3	107	14	0.26
12,7	eShop	40.95	107	14	0.26
12,8	eShop	40.8	107	14	0.26
13	eShop	40.5	107	14	0.26
13,2	eShop	40.2	107	14	0.26
13,5	eShop	39.8	107	14	0.26
13,8	eShop	39.3	107	14	0.26
14	eShop	39	107	14	0.26
14,2	eShop	43.7	115	16	0.26
9/16	eShop ■	43.7	115	16	0.26
14,5	eShop	43.3	115	16	0.26
14,8	eShop	42.8	115	16	0.26
15	eShop	42.5	115	16	0.26
19/32	eShop ■	42.5	115	16	0.26
15,1	eShop	42.4	115	16	0.26
15,2	eShop	42.2	115	16	0.26
15,5	eShop	41.8	115	16	0.26
15,8	eShop	41.3	115	16	0.26
5/8	eShop ■	41.3	115	16	0.26
16	eShop	41	115	16	0.26
16,2	eShop	48.7	123	18	0.28
16,5	eShop	48.3	123	18	0.28
21/32	eShop ■	48.3	123	18	0.28
16,8	eShop	47.8	123	18	0.28
17	eShop	47.5	123	18	0.28
17,2	eShop	47.2	123	18	0.28
17,3	eShop	47.05	123	18	0.28
11/16	eShop ■	46.81	123	18	0.28
17,5	eShop	46.8	123	18	0.28
17,7	eShop	46.5	123	18	0.28
17,8	eShop	46.3	123	18	0.28
18	eShop	46	123	18	0.28
18,2	eShop	51.7	131	20	0.28
18,5	eShop	51.3	131	20	0.28
18,8	eShop	50.8	131	20	0.28
19	eShop	50.5	131	20	0.28
3/4	eShop ■	50.5	131	20	0.28
19,05	eShop	50.4	131	20	0.28
19,2	eShop	50.2	131	20	0.28
19,3	eShop	50.1	131	20	0.28
19,5	eShop	49.8	131	20	0.28
19,8	eShop	49.3	131	20	0.28
20	eShop	49	131	20	0.28



Garant Solid carbide drill 180°

Special point geometry for generating **180° flat-bottomed holes**. Low radial forces even when spot drilling on faces with up to 45° slope. Flute geometry for optimum chip evacuation. With 4 guide chamfers to stabilise the drill in the hole.

Advantage: The **180° point angle** permits drilling and counterboring in a single operation.

Recommendation: When using the solid carbide 180° drill it is absolutely essential for process reliability:

- **when spot drilling on flat surfaces** to drill a pilot hole 1xD using pilot drill No. 122736.
- **when spot drilling on sloping surfaces** up to 15°: reduce the feed rate **f to 50 %**, up to 30°: reduce the feed rate **f to 40 %** and up to 45°: reduce the feed rate **f to 25 %** of the stated value. **After spot drilling**, the **normal feed rate value** can be used.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122506 + 129100HB**.
Form **HE**: order with **No. 122506 + 129100HE**.
180° solid carbide drills for machining aluminium available on request.
Not suitable for generating counterbores for socket-head screws to DIN974-1.



Plain shank DIN 6535 HA

122506



Weldon shank DIN 6535 HB 122506 + 129100HB

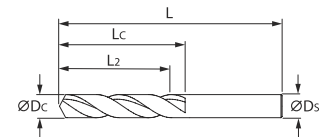


Whistle-Notch shank DIN 6535 HE 122506 + 129100HE

With cutting edge chamfer (= 5% of the nominal $\varnothing$)



122736



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	M	S	K						
12 2506				85	75	60	50							45				90						

$\varnothing D_c$ m7	12 2506	L_2	L	$\varnothing D_s$	f	$\varnothing D_c$ m7	12 2506	L_2	L	$\varnothing D_s$	f	$\varnothing D_c$ m7	12 2506	L_2	L	$\varnothing D_s$	f
	Solid carbide drill plain shank DIN 6535 HA 180°						Solid carbide drill plain shank DIN 6535 HA 180°						Solid carbide drill plain shank DIN 6535 HA 180°				
mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.
3	(eShop)	15.5	62	6	0.05	6,7	(eShop)	24	79	8	0.12	10,6	(eShop)	37.1	100	12	0.15
3,1	(eShop)	15.4	62	6	0.05	6,8	(eShop)	23.8	79	8	0.12	10,7	(eShop)	37	100	12	0.15
3,2	(eShop)	15.2	62	6	0.05	6,9	(eShop)	23.7	79	8	0.12	10,8	(eShop)	36.8	100	12	0.15
3,3	(eShop)	15.1	62	6	0.05	7	(eShop)	23.5	79	8	0.12	10,9	(eShop)	36.7	100	12	0.15
3,4	(eShop)	14.9	62	6	0.05	7,1	(eShop)	30.4	79	8	0.12	11	(eShop)	36.5	100	12	0.15
3,5	(eShop)	14.8	62	6	0.05	7,2	(eShop)	30.2	79	8	0.12	11,1	(eShop)	36.4	100	12	0.15
3,6	(eShop)	14.6	62	6	0.05	7,3	(eShop)	30.1	79	8	0.12	11,2	(eShop)	36.2	100	12	0.15
3,7	(eShop)	14.5	62	6	0.05	7,4	(eShop)	29.9	79	8	0.12	11,3	(eShop)	36.1	100	12	0.15
3,8	(eShop)	18.3	66	6	0.05	7,5	(eShop)	29.8	79	8	0.12	11,4	(eShop)	35.9	100	12	0.15
3,9	(eShop)	18.2	66	6	0.05	7,6	(eShop)	29.6	79	8	0.12	11,5	(eShop)	35.8	100	12	0.15
4	(eShop)	18	66	6	0.08	7,7	(eShop)	29.5	79	8	0.12	11,6	(eShop)	35.6	100	12	0.15
4,1	(eShop)	17.9	66	6	0.08	7,8	(eShop)	29.3	79	8	0.12	11,7	(eShop)	35.5	100	12	0.15
4,2	(eShop)	17.7	66	6	0.08	7,9	(eShop)	29.2	79	8	0.12	11,8	(eShop)	35.3	100	12	0.15
4,3	(eShop)	17.6	66	6	0.08	8	(eShop)	29	79	8	0.12	11,9	(eShop)	35.2	100	12	0.15
4,4	(eShop)	17.4	66	6	0.08	8,1	(eShop)	34.9	89	10	0.15	12	(eShop)	35	100	12	0.15
4,5	(eShop)	17.3	66	6	0.08	8,2	(eShop)	34.7	89	10	0.15	12,5	(eShop)	39.3	105	14	0.16
4,6	(eShop)	17.1	66	6	0.08	8,3	(eShop)	34.6	89	10	0.15	12,8	(eShop)	38.8	105	14	0.16
4,65	(eShop)	17	66	6	0.08	8,4	(eShop)	34.4	89	10	0.15	13	(eShop)	38.5	105	14	0.16
4,7	(eShop)	17	66	6	0.08	8,5	(eShop)	34.3	89	10	0.15	13,5	(eShop)	37.8	105	14	0.16
4,8	(eShop)	20.8	66	6	0.08	8,6	(eShop)	34.1	89	10	0.15	13,8	(eShop)	37.3	105	14	0.16
4,9	(eShop)	20.7	66	6	0.08	8,7	(eShop)	34	89	10	0.15	14	(eShop)	37	105	14	0.16
5	(eShop)	20.5	66	6	0.12	8,8	(eShop)	33.8	89	10	0.15	14,5	(eShop)	41.3	113	16	0.16
5,1	(eShop)	20.4	66	6	0.12	8,9	(eShop)	33.7	89	10	0.15	14,8	(eShop)	40.8	113	16	0.16
5,2	(eShop)	20.2	66	6	0.12	9	(eShop)	33.5	89	10	0.15	15	(eShop)	40.5	113	16	0.16
5,3	(eShop)	20.1	66	6	0.12	9,1	(eShop)	33.4	89	10	0.15	15,5	(eShop)	39.8	113	16	0.16
5,4	(eShop)	19.9	66	6	0.12	9,2	(eShop)	33.2	89	10	0.15	15,8	(eShop)	39.3	113	16	0.16
5,5	(eShop)	19.8	66	6	0.12	9,3	(eShop)	33.1	89	10	0.15	16	(eShop)	39	113	16	0.16
5,55	(eShop)	19.7	66	6	0.12	9,4	(eShop)	32.9	89	10	0.15	16,5	(eShop)	46.3	121	18	0.2
5,6	(eShop)	19.6	66	6	0.12	9,5	(eShop)	32.8	89	10	0.15	16,8	(eShop)	45.8	121	18	0.2
5,7	(eShop)	19.5	66	6	0.12	9,6	(eShop)	32.6	89	10	0.15	17	(eShop)	45.5	121	18	0.2
5,8	(eShop)	19.3	66	6	0.12	9,7	(eShop)	32.5	89	10	0.15	17,5	(eShop)	44.8	121	18	0.2
5,9	(eShop)	19.2	66	6	0.12	9,8	(eShop)	32.3	89	10	0.15	17,8	(eShop)	44.3	121	18	0.2
6	(eShop)	19	66	6	0.12	9,9	(eShop)	32.2	89	10	0.15	18	(eShop)	44	121	18	0.2
6,1	(eShop)	24.9	79	8	0.12	10	(eShop)	32	89	10	0.15	18,5	(eShop)	49.3	129	20	0.2
6,2	(eShop)	24.7	79	8	0.12	10,1	(eShop)	37.9	100	12	0.15	18,8	(eShop)	48.8	129	20	0.2
6,3	(eShop)	24.6	79	8	0.12	10,2	(eShop)	37.7	100	12	0.15	19	(eShop)	48.5	129	20	0.2
6,4	(eShop)	24.4	79	8	0.12	10,3	(eShop)	37.6	100	12	0.15	19,5	(eShop)	47.8	129	20	0.2
6,5	(eShop)	24.3	79	8	0.12	10,4	(eShop)	37.4	100	12	0.15	19,8	(eShop)	47.3	129	20	0.2
6,6	(eShop)	24.1	79	8	0.12	10,5	(eShop)	37.3	100	12	0.15	20	(eShop)	47	129	20	0.23



Garant Solid carbide high performance special drill for GRP / CRP, non-standard sizes

With the latest generation of **crystalline diamond coating sp³**, for process reliability in machining **fibre-reinforced composites, CRP, GRP, and graphite.**

With 90° point angle and special geometry to avoid delamination.

12 2512 – **With guide chamfer** for materials with **multi-directional** fibre orientation.

12 2522 – **With cutting guide chamfer** to avoid delamination, projecting fibres, and burr formation on materials with **uni-directional** fibre orientation.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

Available in **1/100 sizes** and according to the table.

Please note the minimum order quantities for configurable sizes:

Ø range 1.01 – 2.99 mm: **10 pieces**

Ø range 3.01 – 9.99 mm: **5 pieces**

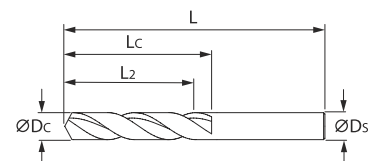
Ø range 10.01 – 11.99 mm: **3 pieces**



12 2512



12 2522



Suitable for/ v _c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
12 2512/2522	150	140	130	120	100		110	100	90	80	90	80	●				100	340		○		●	●

Ø D _c m7	12 2512	12 2522	Ø range (1/100 size) can be configured	L ₂	L	Ø D _s	GFK CFK f
	Solid carbide drill plain shank						
	for multi-directional fibre orientation DIN 6535 HA	for uni-directional fibre orientation DIN 6535 HA					
mm	Diamond	Diamond	mm	mm	mm	mm	mm/rev.
0,9	eShop	—	—	5.2	45	4	0.01
1	eShop	—	—	5.5	45	4	0.02
1,1	(eShop)	—	1.01 – 1.1	5.9	45	4	0.02
1,2	(eShop)	—	1.11 – 1.2	6.7	45	4	0.02
1,3	(eShop)	—	1.21 – 1.3	7.1	45	4	0.02
1,4	(eShop)	—	1.31 – 1.49	7.9	45	4	0.02
1,5	eShop	—	—	8.3	50	4	0.02
1,6	(eShop)	—	1.51 – 1.6	8.6	50	4	0.03
1,7	(eShop)	—	1.61 – 1.7	9.5	50	4	0.03
1,8	(eShop)	—	1.71 – 1.8	9.8	50	4	0.03
1,9	(eShop)	—	1.81 – 1.99	10.7	50	4	0.03
2	eShop	—	—	11	50	4	0.04
2,1	(eShop)	—	2.01 – 2.1	11.4	55	4	0.04
2,2	(eShop)	—	2.11 – 2.2	12.2	55	4	0.04
2,3	(eShop)	—	2.21 – 2.3	12.6	55	4	0.04
2,4	(eShop)	—	2.31 – 2.49	13.4	55	4	0.04
2,5	eShop	eShop	—	20.3	66	6	0.04
2,7	(eShop)	(eShop)	2.51 – 2.99	20	66	6	0.04
3	eShop	eShop	—	23.5	66	6	0.06
3,5	(eShop)	(eShop)	3.01 – 3.99	22.8	66	6	0.06
4	eShop	eShop	—	30	74	6	0.06
4,5	(eShop)	(eShop)	4.01 – 4.99	29.3	74	6	0.06
5	eShop	eShop	—	36.5	82	6	0.11
5,5	(eShop)	(eShop)	5.01 – 5.99	35.8	82	6	0.11
6	eShop	eShop	—	35	82	6	0.11
7	(eShop)	(eShop)	6.01 – 7.99	42.5	91	8	0.11
8	eShop	eShop	—	41	91	8	0.15
8,5	(eShop)	(eShop)	8.01 – 8.99	48.3	103	10	0.15
9	eShop	eShop	—	47.5	103	10	0.15
9,5	(eShop)	(eShop)	9.01 – 9.99	46.8	103	10	0.15
10	eShop	eShop	—	46	103	10	0.19
10,5	(eShop)	(eShop)	10.01 – 10.99	55.3	118	12	0.19
11	eShop	eShop	—	54.5	118	12	0.19
11,5	(eShop)	(eShop)	11.01 – 11.99	53.8	118	12	0.19
12	eShop	eShop	—	53	118	12	0.21



Garant Solid carbide NC high performance drill

Particularly strong due to strengthened core and **special profile**.
Special point geometry. **High concentricity** and **long tool life**.
High bore quality.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122545**.
Form **HE**: order with **No. 122540 + 129100HE**.



Plain shank DIN 6535 HA

122540



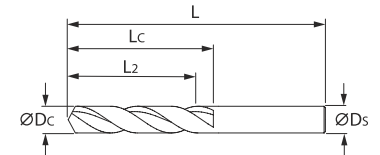
Weldon shank DIN 6535 HB

122545



Whistle-Notch shank DIN 6535 HE

122540 + 129100HE



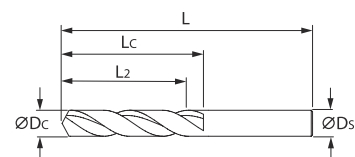
Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
122540	190	170	140	90	85	75	65	40					40	30	25	70	160						

Ø D _c h7	12 2540 Solid carbide NC high performance drill FS, plain shank DIN 6535 HA	L ₂	L	Ø D _s	f
mm	TiAlN	mm	mm	mm	mm/rev.
2	eShop	18	57	4	0.1
2,1	eShop	17.9	57	4	0.1
2,2	eShop	17.7	57	4	0.1
2,3	eShop	17.6	57	4	0.1
2,4	eShop	17.4	57	4	0.1
2,5	eShop	17.3	57	4	0.1
2,6	eShop	17.1	57	4	0.1
2,7	eShop	17	57	4	0.1
2,8	eShop	16.8	57	4	0.1
2,9	eShop	16.7	57	4	0.1
3	eShop	23.5	66	6	0.14
3,1	eShop	23.4	66	6	0.14
3,2	eShop	23.2	66	6	0.14
3,3	eShop	23.1	66	6	0.14
3,4	eShop	22.9	66	6	0.14
3,5	eShop	22.8	66	6	0.14
3,6	eShop	22.6	66	6	0.14
3,7	eShop	22.5	66	6	0.14
3,8	eShop	22.3	66	6	0.14
3,9	eShop	22.2	66	6	0.14
4	eShop	22	66	6	0.14
4,1	eShop	37.9	82	6	0.14
4,2	eShop	37.7	82	6	0.14
4,3	eShop	37.6	82	6	0.14
4,4	eShop	37.4	82	6	0.14
4,5	eShop	37.3	82	6	0.14
4,6	eShop	37.1	82	6	0.14
4,7	eShop	37	82	6	0.14
4,8	eShop	36.8	82	6	0.14
4,9	eShop	36.7	82	6	0.14
5	eShop	36.5	82	6	0.14
5,1	eShop	36.4	82	6	0.14
5,2	eShop	36.2	82	6	0.14
5,3	eShop	36.1	82	6	0.14
5,4	eShop	35.9	82	6	0.14
5,5	eShop	35.8	82	6	0.14
5,6	eShop	35.6	82	6	0.14
5,7	eShop	35.5	82	6	0.14
5,8	eShop	35.3	82	6	0.14
5,9	eShop	35.2	82	6	0.14
6	eShop	35	82	6	0.2
6,1	eShop	43.9	91	8	0.2
6,2	eShop	43.7	91	8	0.2
6,3	eShop	43.6	91	8	0.2
6,4	eShop	43.4	91	8	0.2
6,5	eShop	43.3	91	8	0.2

Ø D _c h7	12 2540 Solid carbide NC high performance drill FS, plain shank DIN 6535 HA	L ₂	L	Ø D _s	f
mm	TiAlN	mm	mm	mm	mm/rev.
6,6	eShop	43.1	91	8	0.2
6,7	eShop	43	91	8	0.2
6,8	eShop	42.8	91	8	0.2
6,9	eShop	42.7	91	8	0.2
7	eShop	42.5	91	8	0.2
7,2	eShop	42.2	91	8	0.2
7,4	eShop	41.9	91	8	0.2
7,5	eShop	41.8	91	8	0.2
7,6	(eShop)	41.6	91	8	0.2
7,8	eShop	41.3	91	8	0.2
7,9	eShop	41.2	91	8	0.2
8	eShop	41	91	8	0.2
8,1	eShop	48.9	103	10	0.2
8,2	eShop	48.7	103	10	0.2
8,4	eShop	48.4	103	10	0.2
8,5	eShop	48.3	103	10	0.2
8,6	eShop	48.1	103	10	0.2
8,7	eShop	48	103	10	0.2
8,8	eShop	47.8	103	10	0.2
9	eShop	47.5	103	10	0.27
9,1	eShop	47.4	103	10	0.27
9,3	eShop	47.1	103	10	0.27
9,5	eShop	46.8	103	10	0.27
9,6	eShop	46.6	103	10	0.27
9,8	eShop	46.3	103	10	0.27
10	eShop	46	103	10	0.27
10,2	eShop	55.7	118	12	0.27
10,5	eShop	55.3	118	12	0.27
10,8	eShop	54.8	118	12	0.27
11	eShop	54.5	118	12	0.27
11,2	eShop	54.2	118	12	0.27
11,5	eShop	53.8	118	12	0.27
11,8	eShop	53.3	118	12	0.27
12	eShop	53	118	12	0.35
12,2	eShop	58.7	124	14	0.35
12,5	eShop	58.3	124	14	0.35
13	eShop	57.5	124	14	0.35
13,5	eShop	56.8	124	14	0.35
14	eShop	56	124	14	0.35
14,2	eShop	61.7	133	16	0.35
14,5	eShop	61.3	133	16	0.35
15	eShop	60.5	133	16	0.35
15,2	eShop	60.2	133	16	0.35
15,8	eShop	59.3	133	16	0.35
16	eShop	59	133	16	0.45



For **HB**: use order **No. 122596**.



Ø D _c h7	11E	12 2590	11E	12 2595	L ₂	L	Ø D ₁	Alu  f	Ø D _c h7	11E	12 2590	11E	12 2595	L ₂	L	Ø D ₁	Alu  f
	GARANT Master Alu Feed solid carbide drill, plain shank									GARANT Master Alu Feed solid carbide drill, plain shank							
	DIN 6535 HA									DIN 6535 HA							
	mm		DLC							mm	mm	mm	mm/rev.				
4	eShop	eShop		30	74	6	0.53	7	eShop	(eShop)		42.5	91	8	0.81		
4,1	eShop	(eShop)		29.9	74	6	0.54	7,3	eShop	(eShop)		42	91	8	0.82		
4,2	eShop	(eShop)		29.7	74	6	0.55	7,4	eShop	(eShop)		41.9	91	8	0.84		
4,3	eShop	(eShop)		29.6	74	6	0.56	7,45	eShop	(eShop)		41.8	91	8	0.84		
4,5	eShop	(eShop)		29.3	74	6	0.58	7,5	eShop	(eShop)		41.8	91	8	0.85		
4,6	eShop	(eShop)		29.1	74	6	0.59	7,8	eShop	(eShop)		41.3	91	8	0.88		
4,65	eShop	(eShop)		29	74	6	0.59	8	eShop	(eShop)		41	91	8	0.89		
4,8	eShop	(eShop)		36.8	82	6	0.61	8,1	eShop	(eShop)		48.9	103	10	0.9		
4,9	eShop	(eShop)		36.7	82	6	0.62	8,4	eShop	(eShop)		48.4	103	10	0.92		
5	eShop	(eShop)		36.5	82	6	0.63	8,5	eShop	eShop		48.3	103	10	0.93		
5,1	eShop	(eShop)		36.4	82	6	0.64	8,8	eShop	(eShop)		47.8	103	10	0.95		
5,2	eShop	(eShop)		36.2	82	6	0.65	9	eShop	(eShop)		47.5	103	10	0.97		
5,3	eShop	(eShop)		36.1	82	6	0.66	9,1	eShop	(eShop)		47.4	103	10	0.98		
5,5	eShop	(eShop)		35.8	82	6	0.68	9,8	eShop	(eShop)		46.3	103	10	1.03		
5,55	eShop	(eShop)		35.7	82	6	0.68	10	eShop	(eShop)		46	103	10	1.04		
5,6	eShop	(eShop)		35.6	82	6	0.69	10,2	eShop	(eShop)		55.7	118	12	1.06		
5,8	eShop	(eShop)		35.3	82	6	0.7	10,5	eShop	(eShop)		55.3	118	12	1.08		
5,9	eShop	(eShop)		35.2	82	6	0.71	11	eShop	(eShop)		54.5	118	12	1.11		
6	eShop	(eShop)		35	82	6	0.72	11,5	eShop	(eShop)		53.8	118	12	1.15		
6,1	eShop	(eShop)		43.9	91	8	0.73	11,8	eShop	(eShop)		53.3	118	12	1.16		
6,2	eShop	(eShop)		43.7	91	8	0.74	12	eShop	(eShop)		53	118	12	1.18		
6,3	eShop	(eShop)		43.6	91	8	0.75	12,5	eShop	(eShop)		58.3	124	14	1.21		
6,4	eShop	(eShop)		43.4	91	8	0.76	13	eShop	(eShop)		57.5	124	14	1.24		
6,5	eShop	(eShop)		43.3	91	8	0.77	14	eShop	(eShop)		56	124	14	1.29		
6,6	eShop	(eShop)		43.1	91	8	0.78	14,5	eShop	(eShop)		61.3	133	16	1.32		
6,8	eShop	(eShop)		42.8	91	8	0.79	15	eShop	(eShop)		60.5	133	16	1.35		
6,9	eShop	(eShop)		42.7	91	8	0.8	16	eShop	(eShop)		59	133	16	1.4		

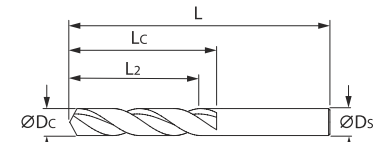


Garant Solid carbide HPC drill

DLC coating sp^2 of the latest generation with **low coefficient of friction** results in **outstanding chip clearance**. For **high-performance milling of aluminium materials**. **High alignment accuracy** and **roundness of the hole**, thanks to **6 guide chamfers**.

Size 1 - 1.5 with 4 guide chamfers.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122603**.
Form **HE**: order with **No. 122602 + 129100HE**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	Cu	CuZn	GRP	CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
12 2602	360	400	350	150				120			90		80	70	80	160	200	80	80			

$\varnothing D_c$ h7	12 2602	L_2	L	Shank $\varnothing D_s$	Alu f	$\varnothing D_c$ h7	12 2602	L_2	L	Shank $\varnothing D_s$	Alu f	$\varnothing D_c$ h7	12 2602	L_2	L	Shank $\varnothing D_s$	Alu f
	Solid carbide HPC drill, plain shank DIN 6535 HA DLC						Solid carbide HPC drill, plain shank DIN 6535 HA DLC						Solid carbide HPC drill, plain shank DIN 6535 HA DLC				
mm		mm	mm	mm	mm/rev.	mm		mm	mm	mm	mm/rev.	mm		mm	mm	mm	mm/rev.
1	eShop	6.5	55	4	0.1	5	eShop	36.5	82	6	0.35	9,35	eShop	47	103	10	0.55
1,1	eShop	10.4	55	4	0.15	5,1	eShop	36.4	82	6	0.45	9,4	eShop	46.9	103	10	0.55
1,2	eShop	10.2	55	4	0.15	5,2	eShop	36.2	82	6	0.45	9,5	eShop	46.8	103	10	0.55
1,25	eShop	10.2	55	4	0.15	5,3	eShop	36.1	82	6	0.45	9,6	eShop	46.6	103	10	0.55
1,3	eShop	10.1	55	4	0.15	5,4	eShop	35.9	82	6	0.45	9,7	eShop	46.5	103	10	0.55
1,4	eShop	9.9	55	4	0.15	5,5	eShop	35.8	82	6	0.45	9,8	eShop	46.3	103	10	0.55
1,45	eShop	9.9	55	4	0.15	5,55	eShop	35.7	82	6	0.45	9,9	eShop	46.2	103	10	0.55
1,5	eShop	9.8	55	4	0.15	5,6	eShop	35.6	82	6	0.45	10	eShop	46	103	10	0.55
1,6	eShop	13.6	55	4	0.2	5,7	eShop	35.5	82	6	0.45	10,2	eShop	55.7	118	12	0.55
1,7	eShop	13.5	55	4	0.2	5,8	eShop	35.3	82	6	0.45	10,3	eShop	55.6	118	12	0.55
1,8	eShop	13.3	55	4	0.2	5,9	eShop	35.2	82	6	0.45	10,5	eShop	55.3	118	12	0.55
1,85	eShop	13.3	55	4	0.2	6	eShop	35	82	6	0.45	10,8	eShop	54.8	118	12	0.55
1,9	eShop	13.2	55	4	0.2	6,1	eShop	43.9	91	8	0.45	11	eShop	54.5	118	12	0.55
2	eShop	18	57	4	0.2	6,2	eShop	43.7	91	8	0.45	11,2	eShop	54.2	118	12	0.55
2,05	eShop	18	57	4	0.22	6,3	eShop	43.6	91	8	0.45	11,5	eShop	53.8	118	12	0.55
2,1	eShop	17.9	57	4	0.22	6,4	eShop	43.4	91	8	0.45	11,8	eShop	53.3	118	12	0.55
2,2	eShop	17.7	57	4	0.22	6,5	eShop	43.3	91	8	0.45	12	eShop	53	118	12	0.55
2,3	eShop	17.6	57	4	0.22	6,6	eShop	43.1	91	8	0.45	12,5	eShop	58.3	124	14	0.65
2,4	eShop	17.4	57	4	0.22	6,7	eShop	43	91	8	0.45	12,8	eShop	57.8	124	14	0.65
2,5	eShop	17.3	57	4	0.22	6,8	eShop	42.8	91	8	0.45	13	eShop	57.5	124	14	0.65
2,6	eShop	17.1	57	4	0.22	6,9	eShop	42.7	91	8	0.45	13,1	eShop	57.4	124	14	0.65
2,7	eShop	17	57	4	0.22	7	eShop	42.5	91	8	0.45	13,5	eShop	56.8	124	14	0.65
2,8	eShop	16.8	57	4	0.22	7,1	eShop	42.4	91	8	0.45	13,8	eShop	56.3	124	14	0.65
2,9	eShop	16.7	57	4	0.22	7,2	eShop	42.2	91	8	0.45	14	eShop	56	124	14	0.65
3	eShop	23.5	66	6	0.22	7,3	eShop	42.1	91	8	0.45	14,5	eShop	61.3	133	16	0.65
3,1	eShop	23.4	66	6	0.35	7,4	eShop	41.9	91	8	0.45	14,8	eShop	60.8	133	16	0.65
3,2	eShop	23.2	66	6	0.35	7,45	eShop	41.9	91	8	0.45	15	eShop	60.5	133	16	0.65
3,25	eShop	23.2	66	6	0.35	7,5	eShop	41.8	91	8	0.45	15,1	eShop	60.4	133	16	0.65
3,3	eShop	23.1	66	6	0.35	7,6	eShop	41.6	91	8	0.45	15,5	eShop	59.8	133	16	0.65
3,4	eShop	22.9	66	6	0.35	7,7	eShop	41.5	91	8	0.45	15,8	eShop	59.3	133	16	0.65
3,5	eShop	22.8	66	6	0.35	7,8	eShop	41.3	91	8	0.45	16	eShop	59	133	16	0.65
3,6	eShop	22.6	66	6	0.35	7,9	eShop	41.2	91	8	0.45	16,5	eShop	68.3	143	18	0.7
3,7	eShop	22.5	66	6	0.35	8	eShop	41	91	8	0.45	16,8	eShop	67.8	143	18	0.7
3,8	eShop	30.3	74	6	0.35	8,1	eShop	48.9	103	10	0.55	17	eShop	67.5	143	18	0.7
3,9	eShop	30.2	74	6	0.35	8,2	eShop	48.7	103	10	0.55	17,5	eShop	66.8	143	18	0.7
4	eShop	30	74	6	0.35	8,3	eShop	48.6	103	10	0.55	17,8	eShop	66.3	143	18	0.7
4,1	eShop	29.9	74	6	0.35	8,4	eShop	48.4	103	10	0.55	18	eShop	66	143	18	0.7
4,2	eShop	29.7	74	6	0.35	8,5	eShop	48.3	103	10	0.55	18,5	eShop	73.3	153	20	0.7
4,3	eShop	29.6	74	6	0.35	8,6	eShop	48.1	103	10	0.55	18,8	eShop	72.8	153	20	0.7
4,4	eShop	29.4	74	6	0.35	8,7	eShop	48	103	10	0.55	18,85	eShop	72.8	153	20	0.7
4,5	eShop	29.3	74	6	0.35	8,8	eShop	47.8	103	10	0.55	19	eShop	72.5	153	20	0.7
4,6	eShop	29.1	74	6	0.35	8,9	eShop	47.7	103	10	0.55	19,5	eShop	71.8	153	20	0.7
4,65	eShop	29.1	74	6	0.35	9	eShop	47.5	103	10	0.55	19,8	eShop	71.3	153	20	0.7
4,7	eShop	29	74	6	0.35	9,1	eShop	47.4	103	10	0.55	20	eShop	71	153	20	0.7
4,8	eShop	36.8	82	6	0.35	9,2	eShop	47.2	103	10	0.55						
4,9	eShop	36.7	82	6	0.35	9,3	eShop	47.1	103	10	0.55						



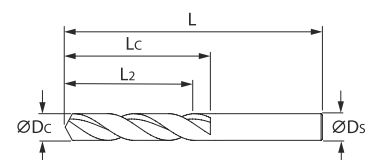
Garant Solid carbide HPC pilot drill

Spiral fluted, with **6 guide chamfers** and internal cooling channels.

New generation of high performance pilot drills in the HPC range.

With **140° point angle** and special **p6 cutting edge tolerance** for optimum generation of a pilot hole. High alignment accuracy and **roundness of the pilot hole**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
For deep-hole drilling deeper than $16 \times D$ a pilot hole is recommended, and for deep-hole drilling from $20 \times D$ to $30 \times D$ it is essential. **The generation of a pilot hole improves process reliability.**
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122608**.
Form **HE**: order with **No. 122606 + 129100HE**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	Cu	CuZn	GRP	CRP				
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
12 2606	360	400	350	150			120		90		80	70	80	160	200	80	80				

$\varnothing D_c$ p6	12 2606	L_2	L	$\varnothing D_s$	Alu f
	Solid carbide HPC drill plain shank				
	DIN 6535 HA				
	DLC				
mm		mm	mm	mm	mm/rev.
2	eShop	18	57	4	0.16
2,2	eShop	17.7	57	4	0.18
2,3	eShop	17.6	57	4	0.18
2,4	eShop	17.4	57	4	0.18
2,5	eShop	17.3	57	4	0.18
2,7	eShop	17	57	4	0.18
2,8	eShop	16.8	57	4	0.18
3	eShop	23.5	66	6	0.18
3,2	eShop	23.2	66	6	0.28
3,3	eShop	23.1	66	6	0.28
3,5	eShop	22.8	66	6	0.28
3,8	eShop	30.3	74	6	0.28
4	eShop	30	74	6	0.28
4,2	eShop	29.7	74	6	0.28
4,5	eShop	29.3	74	6	0.28
4,7	eShop	29	74	6	0.28
4,8	eShop	36.8	82	6	0.28
5	eShop	36.5	82	6	0.28

$\varnothing D_c$ p6	12 2606	L_2	L	$\varnothing D_s$	Alu f
	Solid carbide HPC drill plain shank				
	DIN 6535 HA				
	DLC				
mm		mm	mm	mm	mm/rev.
5,5	eShop	35.8	82	6	0.36
5,8	eShop	35.3	82	6	0.36
6	eShop	35	82	6	0.36
6,5	eShop	43.3	91	8	0.36
6,8	eShop	42.8	91	8	0.36
7	eShop	42.5	91	8	0.36
7,5	eShop	41.8	91	8	0.36
7,8	eShop	41.3	91	8	0.36
8	eShop	41	91	8	0.36
8,5	eShop	48.3	103	10	0.44
8,8	eShop	47.8	103	10	0.44
9	eShop	47.5	103	10	0.44
9,8	eShop	46.3	103	10	0.44
10	eShop	46	103	10	0.44
10,2	eShop	55.7	118	12	0.44
10,8	eShop	54.8	118	12	0.44
11,8	eShop	53.3	118	12	0.44
12	eShop	53	118	12	0.44



Garant GARANT Diabolo solid carbide HPC drill for hard machining

Cutting chisel edge with **high centring accuracy** due to **strong core and special point geometry**. **Convex major cutting edges** with **defined honed edge** ensure the drill has high stability and maximum load capacity.

Special multi-nano layer coating for drilling in hardened steels.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

Form HB and HE supplied at the same price as HA.

Form **HB**: order with **No. 122642 / 122652**.

Form **HE**: order with **No. 122641 / 122651 + 129100HE**.

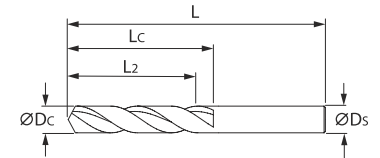
12 2651 – When drilling in hardened steels from 56 HRC, only cool using air!



plain shank DIN 6535 HA 12 2641



plain shank DIN 6535 HA 12 2651



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	> 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
12 2641				90	80	70	65	55	28	16	14	10					70						
12 2651				120	100	85	70	55	28	16	14	10					70						

Ø D _c h7	12 2641	12 2651	L ₂	L	Ø D _s	f
	GARANT Diabolo solid carbide HPC drill, plain shank					
	DIN 6535 HA					
mm	TiAIN	TiAIN	mm	mm	mm	mm/rev. mm/rev.
1	—	eShop	6.5	55	4	— 0.01
1,1	—	eShop	10.4	55	4	— 0.01
1,2	—	eShop	10.2	55	4	— 0.01
1,3	—	eShop	10.1	55	4	— 0.01
1,4	—	eShop	9.9	55	4	— 0.01
1,5	—	eShop	9.8	55	4	— 0.01
1,6	—	eShop	13.6	55	4	— 0.013
1,7	—	eShop	13.5	55	4	— 0.013
1,8	—	eShop	13.3	55	4	— 0.013
1,9	—	eShop	13.2	55	4	— 0.013
2	eShop	eShop	18	57	4	0.04 0.013
2,1	—	eShop	17.9	57	4	— 0.02
2,3	—	eShop	17.6	57	4	— 0.02
2,4	—	eShop	17.4	57	4	— 0.02
2,5	eShop	eShop	17.3	57	4	0.05 0.02
2,6	eShop	eShop	17.1	57	4	0.05 0.02
2,7	—	eShop	17	57	4	— 0.02
2,8	eShop	eShop	16.8	57	4	0.05 0.02
2,9	—	eShop	16.7	57	4	— 0.02
3	eShop	eShop	23.5	66	6	0.05 0.02
3,1	—	eShop	23.4	66	6	— 0.03
3,2	—	eShop	23.2	66	6	— 0.03
3,3	eShop	eShop	23.1	66	6	0.06 0.03
3,4	eShop	eShop	22.9	66	6	0.06 0.03
3,5	eShop	eShop	22.8	66	6	0.06 0.03
3,7	eShop	eShop	22.5	66	6	0.06 0.03
3,8	eShop	eShop	30.3	74	6	0.06 0.03
3,9	eShop	eShop	30.2	74	6	0.06 0.03
4	eShop	eShop	30	74	6	0.06 0.03
4,1	—	eShop	29.9	74	6	— 0.04
4,2	eShop	eShop	29.7	74	6	0.07 0.04
4,3	eShop	eShop	29.6	74	6	0.07 0.04
4,5	eShop	eShop	29.3	74	6	0.07 0.04
4,8	eShop	—	36.8	82	6	0.07 —
4,9	eShop	—	36.7	82	6	0.07 —
5	eShop	eShop	36.5	82	6	0.07 0.04
5,1	eShop	eShop	36.4	82	6	0.08 0.055
5,2	eShop	eShop	36.2	82	6	0.08 0.055
5,3	—	eShop	36.1	82	6	— 0.055
5,5	eShop	eShop	35.8	82	6	0.08 0.055
5,8	eShop	eShop	35.3	82	6	0.08 0.055
5,9	eShop	—	35.2	82	6	0.08 —
6	eShop	eShop	35	82	6	0.08 0.055
6,1	—	eShop	43.9	91	8	— 0.08
6,2	—	eShop	43.7	91	8	— 0.08

Ø D _c h7	12 2641	12 2651	L ₂	L	Ø D _s	f
	GARANT Diabolo solid carbide HPC drill, plain shank					
	DIN 6535 HA					
mm	TiAIN	TiAIN	mm	mm	mm	mm/rev. mm/rev.
6,3	—	eShop	43.6	91	8	— 0.08
6,5	eShop	eShop	43.3	91	8	0.09 0.08
6,6	—	eShop	43.1	91	8	— 0.08
6,8	eShop	eShop	42.8	91	8	0.09 0.08
6,9	—	eShop	42.7	91	8	— 0.08
7	eShop	eShop	42.5	91	8	0.09 0.08
7,2	eShop	—	42.2	91	8	0.09 —
7,5	—	eShop	41.8	91	8	— 0.08
7,8	eShop	eShop	41.3	91	8	0.09 0.08
7,9	eShop	—	41.2	91	8	0.09 —
8	eShop	eShop	41	91	8	0.09 0.08
8,5	eShop	eShop	48.3	103	10	0.11 0.12
8,6	—	eShop	48.1	103	10	— 0.12
8,7	eShop	—	48	103	10	0.11 —
8,8	eShop	eShop	47.8	103	10	0.11 0.12
9	eShop	eShop	47.5	103	10	0.11 0.12
9,3	—	eShop	47.1	103	10	— 0.12
9,5	—	eShop	46.8	103	10	— 0.12
9,8	eShop	eShop	46.3	103	10	0.11 0.12
9,9	eShop	—	46.2	103	10	0.11 —
10	eShop	eShop	46	103	10	0.11 0.12
10,2	eShop	eShop	55.7	118	12	0.11 0.12
10,3	eShop	eShop	55.6	118	12	0.11 0.12
10,5	eShop	eShop	55.3	118	12	0.11 0.12
11	eShop	eShop	54.5	118	12	0.11 0.12
11,5	—	eShop	53.8	118	12	— 0.12
11,8	eShop	eShop	53.3	118	12	0.11 0.12
11,9	eShop	—	53.2	118	12	0.11 —
12	eShop	eShop	53	118	12	0.11 0.12
12,2	—	eShop	58.7	124	14	— 0.16
12,5	eShop	eShop	58.3	124	14	0.13 0.16
13	eShop	eShop	57.5	124	14	0.13 0.16
13,5	—	eShop	56.8	124	14	— 0.16
14	eShop	eShop	56	124	14	0.13 0.16
14,5	—	eShop	61.3	133	16	— 0.16
14,9	eShop	—	60.7	133	16	0.13 —
15	eShop	eShop	60.5	133	16	0.13 0.16
15,8	—	eShop	59.3	133	16	— 0.16
15,9	eShop	—	59.2	133	16	0.13 —
16	eShop	eShop	59	133	16	0.15 0.16
17	—	eShop	67.5	143	18	— 0.2
17,5	eShop	eShop	66.8	143	18	0.15 0.2
18	eShop	—	66	143	18	0.15 —
20	—	eShop	71	153	20	— 0.2



m6

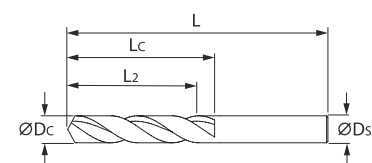
h7

Garant Solid carbide HPC reference drill with 4 cooling channels

Cutting chisel edge with **high centring accuracy** due to **strong core and special point geometry**. High roundness and alignment accuracy of the deep hole, thanks to **4 guide chamfers**. Outstanding chip evacuation due to **4 internal cooling channels** from Ø 3.8 mm. Up to 3.7 mm Ø with 2 internal cooling channels. **Straight major cutting edges** with honed edges and special flute profile for **short chips**, even on long chipping materials.

Attention: Sizes ending with X = cutter Ø tolerance h7.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122661**.
Form **HE**: order with **No. 122659 + 129100HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
12 2659				170	140	130	110	70						90	80		95						

Ø D _c m6 (Ø D _c X = h7)	12 2659 Solid carbide HPC drill plain shank DIN 6535 HA TiAlN	Tolerance nominal Ø	L ₂	L	Ø D _s	INOX > 900 N f
(mm or inch)			mm	mm	mm	mm/rev.
0,9	eShop	m6	6.7	55	4	0.02
1	eShop	m6	6.5	55	4	0.02
1,1	eShop	m6	10.4	55	4	0.03
1,2	eShop	m6	10.2	55	4	0.03
1,25	eShop	m6	10.2	55	4	0.03
1,3	eShop	m6	10.1	55	4	0.03
1,4	eShop	m6	9.9	55	4	0.03
1,45	eShop	m6	9.9	55	4	0.03
1,5	eShop	m6	9.8	55	4	0.03
1,55	eShop	m6	9.7	55	4	0.03
1/16	eShop	m6	13.6	55	4	0.03
1,6	eShop	m6	13.6	55	4	0.03
1,7	eShop	m6	13.5	55	4	0.03
1,8	eShop	m6	13.3	55	4	0.03
1,85	eShop	m6	13.3	55	4	0.03
1,9	eShop	m6	13.2	55	4	0.03
2	eShop	m6	18	57	4	0.05
2,02X	eShop	h7	—	57	4	0.05
2,05	eShop	m6	18	57	4	0.05
2,1	eShop	m6	17.9	57	4	0.05
2,15	eShop	m6	17.8	57	4	0.05
2,2	eShop	m6	17.7	57	4	0.05
2,3	eShop	m6	17.6	57	4	0.05
2,35	eShop	m6	17.5	57	4	0.05
3/32	eShop	m6	17.6	57	4	0.05
2,4	eShop	m6	17.4	57	4	0.05
2,5	eShop	m6	17.3	57	4	0.05
2,52X	eShop	h7	—	57	4	0.05
2,55	eShop	m6	17.2	57	4	0.05
2,6	eShop	m6	17.1	57	4	0.05
2,65	eShop	m6	17.1	57	4	0.05
2,7	eShop	m6	17	57	4	0.05
2,8	eShop	m6	16.8	57	4	0.05
2,85	eShop	m6	16.8	57	4	0.05
2,9	eShop	m6	16.7	57	4	0.05
3	eShop	m6	23.5	66	6	0.08
3,02X	eShop	h7	—	66	6	0.08
3,05	eShop	m6	23.4	66	6	0.08
3,1	eShop	m6	23.4	66	6	0.08
3,15	eShop	m6	23.3	66	6	0.08
1/8	eShop	m6	23.2	66	6	0.08
3,2	eShop	m6	23.2	66	6	0.08
3,25	eShop	m6	23.2	66	6	0.08
3,3	eShop	m6	23.1	66	6	0.08

Ø D _c m6 (Ø D _c X = h7)	12 2659 Solid carbide HPC drill plain shank DIN 6535 HA TiAlN	Tolerance nominal Ø	L ₂	L	Ø D _s	INOX > 900 N f
(mm or inch)			mm	mm	mm	mm/rev.
3,4	eShop	m6	22.9	66	6	0.08
3,5	eShop	m6	22.8	66	6	0.08
3,52X	eShop	h7	—	66	6	0.08
3,55	eShop	m6	22.7	66	6	0.08
3,6	eShop	m6	22.6	66	6	0.08
3,65	eShop	m6	22.6	66	6	0.08
3,7	eShop	m6	22.5	66	6	0.08
3,8	eShop	m6	30.3	74	6	0.08
3,85	eShop	m6	30.2	74	6	0.08
3,9	eShop	m6	30.2	74	6	0.08
5/32	eShop	m6	30	74	6	0.08
4	eShop	m6	30	74	6	0.08
4,02X	eShop	h7	—	74	6	0.08
4,05	eShop	m6	29.9	74	6	0.08
4,1	eShop	m6	29.9	74	6	0.08
4,15	eShop	m6	29.8	74	6	0.08
4,2	eShop	m6	29.7	74	6	0.08
4,3	eShop	m6	29.6	74	6	0.08
4,35	eShop	m6	29.5	74	6	0.08
4,4	eShop	m6	29.4	74	6	0.08
4,45	eShop	m6	29.3	74	6	0.08
4,5	eShop	m6	29.3	74	6	0.08
4,6	eShop	m6	29.1	74	6	0.08
4,65	eShop	m6	29.1	74	6	0.08
4,7	eShop	m6	29	74	6	0.08
3/16	eShop	m6	36.8	82	6	0.08
4,8	eShop	m6	36.8	82	6	0.08
4,9	eShop	m6	36.7	82	6	0.08
5	eShop	m6	36.5	82	6	0.08
5,02X	eShop	h7	—	82	6	0.12
5,05	eShop	m6	36.4	82	6	0.12
5,1	eShop	m6	36.4	82	6	0.12
5,2	eShop	m6	36.2	82	6	0.12
5,25	eShop	m6	36.2	82	6	0.12
5,3	eShop	m6	36.1	82	6	0.12
5,4	eShop	m6	35.9	82	6	0.12
5,5	eShop	m6	35.8	82	6	0.12
5,55	eShop	m6	35.7	82	6	0.12
7/32	eShop	m6	35.6	82	6	0.12
5,6	eShop	m6	35.6	82	6	0.12
5,65	eShop	m6	35.6	82	6	0.12
5,7	eShop	m6	35.5	82	6	0.12
5,75	eShop	m6	35.4	82	6	0.12
5,8	eShop	m6	35.3	82	6	0.12

$\varnothing D_c$ m6 ($\varnothing D_c X = h7$)	11E 12 2659 Solid carbide HPC drill plain shank DIN 6535 HA	Tolerance nominal $\varnothing$	L_2	L	$\varnothing D_s$	INOX > 900 N f
(mm or inch)	TiAlN		mm	mm	mm	mm/rev.
5,9	eShop	m6	35.2	82	6	0.12
5,95	eShop	m6	35	82	6	0.12
6	eShop	m6	35	82	6	0.12
6,02X	eShop	h7	—	82	6	0.12
6,05	eShop	m6	44	91	8	0.12
6,1	eShop	m6	43.9	91	8	0.12
6,15	eShop	m6	43.8	91	8	0.12
6,2	eShop	m6	43.7	91	8	0.12
6,3	eShop	m6	43.6	91	8	0.12
1/4	eShop	m6	43.6	91	8	0.12
6,35	eShop	m6	43.5	91	8	0.12
6,4	eShop	m6	43.4	91	8	0.12
6,5	eShop	m6	43.3	91	8	0.12
6,6	eShop	m6	43.1	91	8	0.12
6,7	eShop	m6	43	91	8	0.12
6,8	eShop	m6	42.8	91	8	0.12
6,9	eShop	m6	42.7	91	8	0.12
7	eShop	m6	42.5	91	8	0.12
7,02X	eShop	h7	—	91	8	0.12
7,1	eShop	m6	42.4	91	8	0.12
9/32	eShop	m6	42.4	91	8	0.12
7,2	eShop	m6	42.2	91	8	0.12
7,25	eShop	m6	42.2	91	8	0.12
7,3	eShop	m6	42.1	91	8	0.12
7,4	eShop	m6	41.9	91	8	0.12
7,45	eShop	m6	41.9	91	8	0.12
7,5	eShop	m6	41.8	91	8	0.12
7,55	eShop	m6	41.7	91	8	0.12
7,6	eShop	m6	41.6	91	8	0.12
7,7	eShop	m6	41.5	91	8	0.12
7,8	eShop	m6	41.3	91	8	0.12
7,9	eShop	m6	41.2	91	8	0.12
5/16	eShop	m6	41.2	91	8	0.12
8	eShop	m6	41	91	8	0.12
8,02X	eShop	h7	—	91	8	0.15
8,05	eShop	m6	49	103	10	0.15
8,1	eShop	m6	48.9	103	10	0.15
8,15	eShop	m6	48.8	103	10	0.15
8,2	eShop	m6	48.7	103	10	0.15
8,25	eShop	m6	48.7	103	10	0.15
8,3	eShop	m6	48.6	103	10	0.15
8,4	eShop	m6	48.4	103	10	0.15
8,5	eShop	m6	48.3	103	10	0.15
8,52X	eShop	h7	—	103	10	0.15
8,6	eShop	m6	48.1	103	10	0.15
8,7	eShop	m6	48	103	10	0.15
11/32	eShop	m6	48	103	10	0.15
8,8	eShop	m6	47.8	103	10	0.15
8,9	eShop	m6	47.7	103	10	0.15
9	eShop	m6	47.5	103	10	0.15
9,02X	eShop	h7	—	103	10	0.15
9,05	eShop	m6	47.4	103	10	0.15
9,1	eShop	m6	47.4	103	10	0.15
9,2	eShop	m6	47.2	103	10	0.15
9,25	eShop	m6	47.2	103	10	0.15
9,3	eShop	m6	47.1	103	10	0.15
9,35	eShop	m6	47	103	10	0.15
9,4	eShop	m6	46.9	103	10	0.15
9,5	eShop	m6	46.8	103	10	0.15
3/8	eShop	m6	46.8	103	10	0.15
9,55	eShop	m6	46.7	103	10	0.15
9,6	eShop	m6	46.6	103	10	0.15
9,7	eShop	m6	46.5	103	10	0.15
9,8	eShop	m6	46.3	103	10	0.15
9,9	eShop	m6	46.2	103	10	0.15
10	eShop	m6	46	103	10	0.15
10,02X	eShop	h7	—	103	10	0.15
10,05	eShop	m6	56	118	12	0.15
10,1	eShop	m6	55.9	118	12	0.15
10,2	eShop	m6	55.7	118	12	0.15
10,25	eShop	m6	55.7	118	12	0.15
10,3	eShop	m6	55.6	118	12	0.15
13/32	eShop	m6	55.6	118	12	0.15
10,4	eShop	m6	55.4	118	12	0.15
10,5	eShop	m6	55.3	118	12	0.15
10,55	eShop	m6	55.2	118	12	0.15
10,6	eShop	m6	55.1	118	12	0.15
10,7	eShop	m6	55	118	12	0.15
10,75	eShop	m6	54.9	118	12	0.15

$\varnothing D_c$ m6 ($\varnothing D_c X = h7$)	11E 12 2659 Solid carbide HPC drill plain shank DIN 6535 HA	Tolerance nominal $\varnothing$	L_2	L	$\varnothing D_s$	INOX > 900 N f
(mm or inch)	TiAlN		mm	mm	mm	mm/rev.
10,8	eShop	m6	54.8	118	12	0.15
10,85	eShop	m6	54.8	118	12	0.15
10,9	eShop	m6	54.7	118	12	0.15
11	eShop	m6	54.5	118	12	0.15
11,1	eShop	m6	54.4	118	12	0.15
7/16	eShop	m6	54.4	118	12	0.15
11,2	eShop	m6	54.2	118	12	0.15
11,25	eShop	m6	54.2	118	12	0.15
11,3	eShop	m6	54.1	118	12	0.15
11,35	eShop	m6	54	118	12	0.15
11,4	(eShop)	m6	53.9	118	12	0.15
11,5	eShop	m6	53.8	118	12	0.15
11,55	eShop	m6	53.7	118	12	0.15
11,6	eShop	m6	53.6	118	12	0.15
11,7	eShop	m6	53.5	118	12	0.15
11,8	eShop	m6	53.3	118	12	0.15
11,9	eShop	m6	53.2	118	12	0.15
12	eShop	m6	53	118	12	0.15
12,02X	eShop	h7	—	118	12	0.2
12,05	eShop	m6	59	124	14	0.2
12,1	eShop	m6	58.9	124	14	0.2
12,2	eShop	m6	58.7	124	14	0.2
12,25	eShop	m6	58.7	124	14	0.2
12,3	eShop	m6	58.6	124	14	0.2
12,5	eShop	m6	58.3	124	14	0.2
12,55	eShop	m6	58.2	124	14	0.2
1/2	eShop	m6	58.2	124	14	0.2
12,7	eShop	m6	58	124	14	0.2
12,8	eShop	m6	57.8	124	14	0.2
12,9	eShop	m6	57.7	124	14	0.2
13	eShop	m6	57.5	124	14	0.2
13,1	eShop	m6	57.4	124	14	0.2
33/64	eShop	m6	57.4	124	14	0.2
13,2	eShop	m6	57.2	124	14	0.2
13,3	eShop	m6	57	124	14	0.2
13,5	eShop	m6	56.8	124	14	0.2
13,8	eShop	m6	56.3	124	14	0.2
14	eShop	m6	56	124	14	0.2
14,05	eShop	m6	62	133	16	0.2
14,1	eShop	m6	61.9	133	16	0.2
14,2	eShop	m6	61.7	133	16	0.2
14,25	eShop	m6	61.7	133	16	0.2
9/16	eShop	m6	61.7	133	16	0.2
14,3	eShop	m6	61.6	133	16	0.2
14,5	eShop	m6	61.3	133	16	0.2
14,8	eShop	m6	60.8	133	16	0.2
15	eShop	m6	60.5	133	16	0.2
15,05	eShop	m6	60.5	133	16	0.2
15,1	eShop	m6	60.4	133	16	0.2
15,2	eShop	m6	60.2	133	16	0.2
15,25	eShop	m6	60.2	133	16	0.2
15,35	eShop	m6	60	133	16	0.2
15,5	eShop	m6	59.8	133	16	0.2
15,8	eShop	m6	59.3	133	16	0.2
5/8	eShop	m6	59	133	16	0.2
16	eShop	m6	59	133	16	0.2
16,05	eShop	m6	59	133	16	0.2
16,25	eShop	m6	68.7	143	18	0.2
16,5	eShop	m6	68.3	143	18	0.25
16,8	eShop	m6	67.8	143	18	0.25
17	eShop	m6	67.5	143	18	0.25
17,35	eShop	m6	67	143	18	0.25
17,5	eShop	m6	66.8	143	18	0.25
17,8	eShop	m6	66.3	143	18	0.25
17,85	eShop	m6	66.3	143	18	0.25
17,9	eShop	m6	66.2	143	18	0.25
18	eShop	m6	66	143	18	0.25
18,3	eShop	m6	73.6	153	20	0.25
18,5	eShop	m6	73.3	153	20	0.25
18,8	eShop	m6	72.8	153	20	0.25
18,85	eShop	m6	72.8	153	20	0.25
18,9	eShop	m6	72.7	153	20	0.25
19	eShop	m6	72.5	153	20	0.25
19,35	eShop	m6	72	153	20	0.25
19,5	eShop	m6	71.8	153	20	0.25
19,8	eShop	m6	71.3	153	20	0.25
20	eShop	m6	71	153	20	0.25
20,05	eShop	m6	71	153	20	0.25
21	eShop	m6	69.5	153	20	0.25



12



HOLEX Pro INOX solid carbide high-performance drill

Efficient drilling especially for use in **stainless and acid-resistant steels**. Straight main cutting edges with **optimised cutting edge design** for improved chip breaking behaviour. Enlarged flutes for **excellent chip evacuation**. Increased wear resistance due to **improved carbide substrate** and **high temperature resistant coating**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and HE shanks are available at the same price as HA.
For **HB shanks**: use order no. **122686**.
For **HE shanks**: use order no. **122687**.



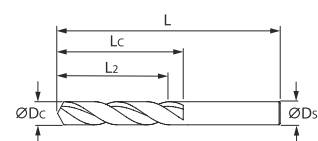
Plain shank DIN 6535 HA 12 2685



Weldon shank DIN 6535 HB 122686



Whistle-Notch shank DIN 6535 HE 122687



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
12 2685														55	45	35							

$\varnothing D_c$ m7	12 2685	L_2	L	$\varnothing D_s$	INOX < 900 N f
mm	AIN	mm	mm	mm	mm/rev.
2	eShop	13	50	4	0.03
2,1	eShop	13.9	55	4	0.03
2,2	eShop	14.2	55	4	0.04
2,3	eShop	15.1	55	4	0.04
2,4	eShop	15.4	55	4	0.04
2,5	eShop	16.3	55	4	0.04
2,6	eShop	17.1	55	4	0.04
2,7	eShop	17.5	55	4	0.04
2,8	eShop	18.3	55	4	0.04
2,9	eShop	18.7	55	4	0.05
3	eShop	23.5	66	6	0.05
3,1	eShop	23.4	66	6	0.05
3,2	eShop	23.2	66	6	0.05
3,25	eShop	23.1	66	6	0.05
3,3	eShop	23.1	66	6	0.05
3,4	eShop	22.9	66	6	0.05
3,5	eShop	22.8	66	6	0.05
3,6	eShop	22.6	66	6	0.06
3,7	eShop	22.5	66	6	0.06
3,8	eShop	30.3	74	6	0.06
3,9	eShop	30.2	74	6	0.06
4	eShop	30	74	6	0.06
4,1	eShop	29.9	74	6	0.06
4,2	eShop	29.7	74	6	0.06
4,3	eShop	29.6	74	6	0.06
4,4	eShop	29.4	74	6	0.07
4,5	eShop	29.3	74	6	0.07
4,6	eShop	29.1	74	6	0.07
4,65	eShop	29	74	6	0.07
4,7	eShop	29	74	6	0.07
4,8	eShop	36.8	82	6	0.07
4,9	eShop	36.7	82	6	0.07
5	eShop	36.5	82	6	0.07
5,1	eShop	36.4	82	6	0.07
5,2	eShop	36.2	82	6	0.07
5,3	eShop	36.1	82	6	0.08
5,4	eShop	35.9	82	6	0.08
5,5	eShop	35.8	82	6	0.08
5,55	eShop	35.7	82	6	0.08
5,6	eShop	35.6	82	6	0.08
5,7	eShop	35.5	82	6	0.08
5,8	eShop	35.3	82	6	0.08

$\varnothing D_c$ m7	12 2685	L_2	L	$\varnothing D_s$	INOX < 900 N f
mm	AIN	mm	mm	mm	mm/rev.
5,9	eShop	35.2	82	6	0.08
6	eShop	35	82	6	0.08
6,1	eShop	43.9	91	8	0.08
6,2	eShop	43.7	91	8	0.09
6,3	eShop	43.6	91	8	0.09
6,4	eShop	43.4	91	8	0.09
6,5	eShop	43.3	91	8	0.09
6,6	eShop	43.1	91	8	0.09
6,7	eShop	43	91	8	0.09
6,8	eShop	42.8	91	8	0.09
6,9	eShop	42.7	91	8	0.09
7	eShop	42.5	91	8	0.09
7,3	eShop	42.1	91	8	0.09
7,4	eShop	41.9	91	8	0.1
7,45	eShop	41.8	91	8	0.1
7,5	eShop	41.8	91	8	0.1
7,55	eShop	41.7	91	8	0.1
7,7	eShop	41.5	91	8	0.1
7,8	eShop	41.3	91	8	0.1
7,9	eShop	41.2	91	8	0.1
8	eShop	41	91	8	0.1
8,1	eShop	48.9	103	10	0.1
8,2	eShop	48.7	103	10	0.1
8,3	eShop	48.6	103	10	0.11
8,5	eShop	48.3	103	10	0.11
8,6	eShop	48.1	103	10	0.11
8,7	eShop	48	103	10	0.11
8,8	eShop	47.8	103	10	0.11
8,9	eShop	47.7	103	10	0.11
9	eShop	47.5	103	10	0.11
9,1	eShop	47.4	103	10	0.11
9,25	eShop	47.1	103	10	0.11
9,3	eShop	47.1	103	10	0.11
9,35	eShop	47	103	10	0.11
9,4	eShop	46.9	103	10	0.12
9,5	eShop	46.8	103	10	0.12
9,55	eShop	46.7	103	10	0.12
9,6	eShop	46.6	103	10	0.12
9,8	eShop	46.3	103	10	0.12
9,9	eShop	46.2	103	10	0.12
10	eShop	46	103	10	0.12
10,2	eShop	55.7	118	12	0.12

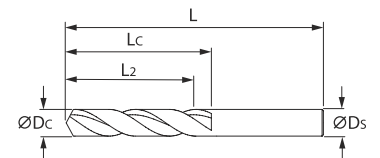
$\varnothing D_c$ m7	12 2685	L_2	L	$\varnothing D_s$	INOX < 900 N f
mm	AIN	mm	mm	mm	mm/rev.
10,3	eShop	55.6	118	12	0.12
10,5	eShop	55.3	118	12	0.12
10,8	eShop	54.8	118	12	0.13
11	eShop	54.5	118	12	0.13
11,2	eShop	54.2	118	12	0.13
11,35	eShop	54	118	12	0.13
11,5	eShop	53.8	118	12	0.13
11,55	eShop	53.7	118	12	0.13
11,8	eShop	53.3	118	12	0.13
12	eShop	53	118	12	0.14
12,2	eShop	58.7	124	14	0.14
12,5	eShop	58.3	124	14	0.14
12,55	eShop	58.2	124	14	0.14
12,8	eShop	57.8	124	14	0.14
13	eShop	57.5	124	14	0.14
13,1	eShop	57.4	124	14	0.14
13,3	eShop	57.1	124	14	0.15
13,5	eShop	56.8	124	14	0.15
13,8	eShop	56.3	124	14	0.15
14	eShop	56	124	14	0.15
14,2	eShop	61.7	133	16	0.15
14,5	eShop	61.3	133	16	0.15
14,8	eShop	60.8	133	16	0.16
15	eShop	60.5	133	16	0.16
15,1	eShop	60.4	133	16	0.16
15,35	eShop	60	133	16	0.16
15,5	eShop	59.8	133	16	0.16
15,8	eShop	59.3	133	16	0.16
16	eShop	59	133	16	0.17
16,05	eShop	68.9	143	18	0.17
16,5	eShop	68.3	143	18	0.17
17	eShop	67.5	143	18	0.17
17,5	eShop	66.8	143	18	0.18
17,8	eShop	66.3	143	18	0.18
18	eShop	66	143	18	0.18
18,5	eShop	73.3	153	20	0.19
18,9	eShop	72.7	153	20	0.19
19	eShop	72.5	153	20	0.19
19,5	eShop	71.8	153	20	0.2
20	eShop	71	153	20	0.2



Garant Solid carbide HPC drill

Specially for machining **titanium-based and nickel-based alloys**.
With wear-resistant, ultra-smooth TiAlSiN high-performance coating for a **long tool life** combined with **optimum bore quality** and **very low burr formation**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and HE shanks are available at the same price as HA.
For **HB**: use order **No. 122681**.
For **HE**: use order **No. 122680** and **129100HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Inconel [®]	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	S	N					
12 2680																45	35						

Ø D _c m7	12 2680 Solid carbide HPC drill, plain shank DIN 6535 HA	L ₂	L	Ø D _s	Ti > 850 N f
mm	TiAlSiN	mm	mm	mm	mm/rev.
2	eShop	15	55	4	0.02
2,1	eShop	14.85	55	4	0.02
2,2	eShop	14.7	55	4	0.02
2,3	eShop	14.55	55	4	0.02
2,4	eShop	18.4	55	4	0.02
2,5	eShop	18.25	55	4	0.02
2,6	eShop	18.1	55	4	0.03
2,7	eShop	17.95	55	4	0.03
2,8	eShop	17.8	55	4	0.03
2,9	eShop	17.65	55	4	0.03
3	eShop	23.5	66	6	0.04
3,1	eShop	23.4	66	6	0.04
3,2	eShop	23.2	66	6	0.04
3,3	eShop	23.1	66	6	0.04
3,4	eShop	22.9	66	6	0.05
3,5	eShop	22.8	66	6	0.05
3,6	eShop	22.6	66	6	0.05
3,7	eShop	22.5	66	6	0.05
3,8	eShop	30.3	74	6	0.05
3,9	eShop	30.2	74	6	0.05
4	eShop	30	74	6	0.05
4,1	eShop	29.9	74	6	0.06
4,2	eShop	29.7	74	6	0.06
4,3	eShop	29.6	74	6	0.06
4,4	eShop	29.4	74	6	0.06
4,5	eShop	29.3	74	6	0.06
4,6	eShop	29.1	74	6	0.06
4,7	eShop	29	74	6	0.06
4,8	eShop	36.8	82	6	0.06
4,9	eShop	36.7	82	6	0.07
5	eShop	36.5	82	6	0.07
5,1	eShop	36.4	82	6	0.07
5,2	eShop	36.2	82	6	0.07
5,3	eShop	36.1	82	6	0.07
5,4	eShop	35.9	82	6	0.07
5,5	eShop	35.8	82	6	0.07
5,6	eShop	35.6	82	6	0.08
5,7	eShop	35.5	82	6	0.08
5,8	eShop	35.3	82	6	0.08
5,9	eShop	35.2	82	6	0.08
6	eShop	35	82	6	0.08
6,1	eShop	43.9	91	8	0.08
6,2	eShop	43.7	91	8	0.08
6,3	eShop	43.6	91	8	0.08
6,4	eShop	43.4	91	8	0.09
6,5	eShop	43.3	91	8	0.09
6,6	eShop	43.1	91	8	0.09
6,7	eShop	43	91	8	0.09
6,8	eShop	42.8	91	8	0.09

Ø D _c m7	12 2680 Solid carbide HPC drill, plain shank DIN 6535 HA	L ₂	L	Ø D _s	Ti > 850 N f
mm	TiAlSiN	mm	mm	mm	mm/rev.
6,9	eShop	42.7	91	8	0.09
7	eShop	42.5	91	8	0.09
7,1	eShop	42.4	91	8	0.09
7,2	eShop	42.2	91	8	0.1
7,3	eShop	42.1	91	8	0.1
7,4	eShop	41.9	91	8	0.1
7,5	eShop	41.8	91	8	0.1
7,6	eShop	41.6	91	8	0.1
7,7	eShop	41.5	91	8	0.1
7,8	eShop	41.3	91	8	0.1
7,9	eShop	41.2	91	8	0.1
8	eShop	41	91	8	0.1
8,1	eShop	48.9	103	10	0.1
8,2	eShop	48.7	103	10	0.11
8,3	eShop	48.6	103	10	0.11
8,4	eShop	48.4	103	10	0.11
8,5	eShop	48.3	103	10	0.11
8,6	eShop	48.1	103	10	0.11
8,7	eShop	48	103	10	0.11
8,8	eShop	47.8	103	10	0.11
8,9	eShop	47.7	103	10	0.12
9	eShop	47.5	103	10	0.12
9,1	eShop	47.4	103	10	0.12
9,2	eShop	47.2	103	10	0.12
9,3	eShop	47.1	103	10	0.12
9,4	eShop	46.9	103	10	0.12
9,5	eShop	46.8	103	10	0.12
9,6	eShop	46.6	103	10	0.12
9,7	eShop	46.5	103	10	0.12
9,8	eShop	46.3	103	10	0.13
9,9	eShop	46.2	103	10	0.13
10	eShop	46	103	10	0.13
10,2	eShop	55.7	118	12	0.13
10,5	eShop	55.3	118	12	0.13
10,8	eShop	54.8	118	12	0.14
11	eShop	54.5	118	12	0.14
11,2	eShop	54.2	118	12	0.14
11,5	eShop	53.8	118	12	0.14
11,8	eShop	53.3	118	12	0.14
12	eShop	53	118	12	0.15
12,2	eShop	58.7	124	14	0.15
12,5	eShop	58.3	124	14	0.15
13	eShop	57.5	124	14	0.16
13,5	eShop	56.8	124	14	0.16
14	eShop	56	124	14	0.16
14,5	eShop	61.3	133	16	0.17
15	eShop	60.5	133	16	0.17
15,5	eShop	59.8	133	16	0.17
16	eShop	59	133	16	0.18



GARANT GARANT Uni Hero solid carbide high-performance drill

The ultimate in universality and profitability in one tool.

Robust tool design and **convex-concave curved cutting edge design** for optimum tool stability and chip breakage behaviour in a wide range of materials. **Special flute geometry** and **polished flutes** for ideal chip evacuation and maximum process reliability.

Ultra-smooth TiAlSiN high-performance coating to effectively reduce wear and the formation of built-up edges.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

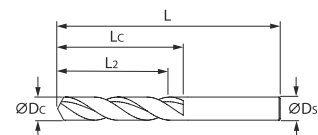
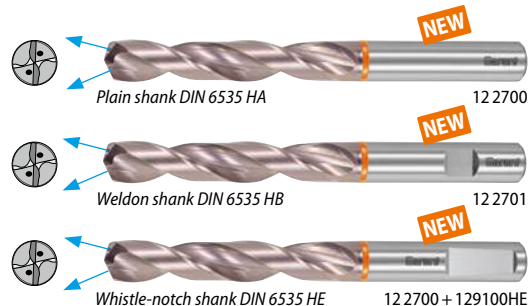
HB and HE shanks are available at the same price as HA.

For **HB shanks**: use order no. **122701**.

HE shank: order with No. **122700** and **12900HE**.

Items with prices in brackets:

Differing delivery time and minimum order quantity 3 pieces.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
12 2700	190	200		160	150	140	110	90						90	80	40	130						

Ø D _c h7	12 2700	L ₂	L	Ø D _s	f	Ø D _c h7	12 2700	L ₂	L	Ø D _s	f
mm	TiAlSiN	mm	mm	mm	mm/rev.	mm	TiAlSiN	mm	mm	mm	mm/rev.
2,5	eShop	18.3	57	4	0.07	7,5	eShop	41.8	91	8	0.18
2,6	eShop	18.1	57	4	0.08	7,6	eShop	41.6	91	8	0.18
2,7	eShop	18	57	4	0.08	7,7	eShop	41.5	91	8	0.18
2,8	eShop	17.8	57	4	0.08	7,8	eShop	41.3	91	8	0.19
2,9	eShop	17.7	57	4	0.08	7,9	eShop	41.2	91	8	0.19
3	eShop	23.5	66	6	0.09	8	eShop	41	91	8	0.19
3,1	eShop	23.4	66	6	0.09	8,1	eShop	48.9	103	10	0.19
3,2	eShop	23.2	66	6	0.09	8,2	eShop	48.7	103	10	0.19
3,3	eShop	23.1	66	6	0.09	8,3	eShop	48.6	103	10	0.19
3,4	eShop	22.9	66	6	0.1	8,4	eShop	48.4	103	10	0.2
3,5	eShop	22.8	66	6	0.1	8,5	eShop	48.3	103	10	0.2
3,6	eShop	22.6	66	6	0.1	8,6	eShop	48.1	103	10	0.2
3,7	eShop	22.5	66	6	0.1	8,7	eShop	48	103	10	0.2
3,8	eShop	30.3	74	6	0.11	8,8	eShop	47.8	103	10	0.2
3,9	eShop	30.2	74	6	0.11	8,9	eShop	47.7	103	10	0.2
4	eShop	30	74	6	0.11	9	eShop	47.5	103	10	0.2
4,1	eShop	29.9	74	6	0.11	9,1	eShop	47.4	103	10	0.21
4,2	eShop	29.7	74	6	0.12	9,2	eShop	47.2	103	10	0.21
4,3	eShop	29.6	74	6	0.12	9,3	eShop	47.1	103	10	0.21
4,4	eShop	29.4	74	6	0.12	9,35	eShop	47	103	10	0.21
4,5	eShop	29.3	74	6	0.12	9,4	eShop	46.9	103	10	0.21
4,6	eShop	29.1	74	6	0.12	9,5	eShop	46.8	103	10	0.21
4,65	eShop	29	74	6	0.13	9,6	eShop	46.6	103	10	0.21
4,7	eShop	29	74	6	0.13	9,7	eShop	46.5	103	10	0.21
4,8	eShop	36.8	82	6	0.13	9,8	eShop	46.3	103	10	0.22
4,9	eShop	36.7	82	6	0.13	9,9	eShop	46.2	103	10	0.22
5	eShop	36.5	82	6	0.13	10	eShop	46	103	10	0.22
5,1	eShop	36.4	82	6	0.14	10,2	eShop	55.7	118	12	0.22
5,2	eShop	36.2	82	6	0.14	10,3	eShop	55.6	118	12	0.22
5,3	eShop	36.1	82	6	0.14	10,5	eShop	55.3	118	12	0.22
5,4	eShop	35.9	82	6	0.14	10,8	eShop	54.8	118	12	0.23
5,5	eShop	35.8	82	6	0.14	11	eShop	54.5	118	12	0.23
5,55	eShop	35.7	82	6	0.14	11,2	eShop	54.2	118	12	0.23
5,6	eShop	35.6	82	6	0.15	11,5	eShop	53.8	118	12	0.24
5,7	eShop	35.5	82	6	0.15	11,8	eShop	53.3	118	12	0.24
5,8	eShop	35.3	82	6	0.15	12	eShop	53	118	12	0.24
5,9	eShop	35.2	82	6	0.15	12,2	eShop	58.7	124	14	0.24
6	eShop	35	82	6	0.15	12,5	eShop	58.3	124	14	0.25
6,1	eShop	43.9	91	8	0.15	12,8	(eShop)	57.8	124	14	0.25
6,2	eShop	43.7	91	8	0.16	13	eShop	57.5	124	14	0.25
6,3	eShop	43.6	91	8	0.16	13,2	(eShop)	57.2	124	14	0.25
6,4	eShop	43.4	91	8	0.16	13,5	eShop	56.8	124	14	0.25
6,5	eShop	43.3	91	8	0.16	13,8	eShop	56.3	124	14	0.26
6,6	eShop	43.1	91	8	0.16	14	eShop	56	124	14	0.26
6,7	eShop	43	91	8	0.17	14,2	eShop	61.7	133	16	0.26
6,8	eShop	42.8	91	8	0.17	14,5	eShop	61.3	133	16	0.26
6,9	eShop	42.7	91	8	0.17	14,8	eShop	60.8	133	16	0.26
7	eShop	42.5	91	8	0.17	15	eShop	60.5	133	16	0.26
7,1	eShop	42.4	91	8	0.17	15,2	(eShop)	60.2	133	16	0.27
7,2	eShop	42.2	91	8	0.18	15,3	eShop	60.1	133	16	0.27
7,3	eShop	42.1	91	8	0.18	15,5	(eShop)	59.8	133	16	0.27
7,4	eShop	41.9	91	8	0.18	15,8	eShop	59.3	133	16	0.27
7,45	eShop	41.8	91	8	0.18	16	eShop	59	133	16	0.27

Garant UNI HERO

UNIVERSAL. SIMPLE. UNIQUE. THE NEW SUPERHERO FOR DRILLING.

True machining heroes are not born, they are made!
The ultimate in universality and profitability in one tool.

Special flute geometry and polished flutes

for ideal chip evacuation and maximum
process reliability in a wide range of
materials.

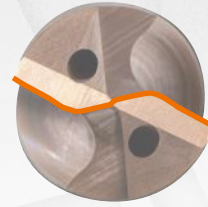
Ultra-smooth TiAlSiN high-performance coating.

to effectively reduce wear
and the formation of built-up edges.

Initial portfolio

- Types:
 - 4 × D (12 2450/51)
 - 6 × D (12 2700/01)
 - 8 × D (12 3020/21)
- All tools with through-coolant.
- Diameter range Ø 2.5 – 16.0 mm.
- Semi-standard for ordering
all intermediate dimensions
via the Hoffmann eShop
(size designation “- X”).

NEW



Convex-concave curved main cutting edge

- Optimum chip-breaking
behaviour and maximum
sturdiness in a
wide range of materials.
- Reliable centering with
increased feed rate.

Stable tool design

prevents tool breakages.

S

M

K

P

N

Use in almost all ISO material groups.*

*Except hard machining > 55 HRC.
Suitable to a limited extent for superalloys
and long-chipping aluminium.
ISO S: Application focus on titanium



Hoffmann Group

Regrinding service

Garant



Future-proof with the
Data Matrix Code (DMC)
to clearly
identify tools.



12



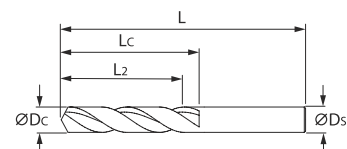
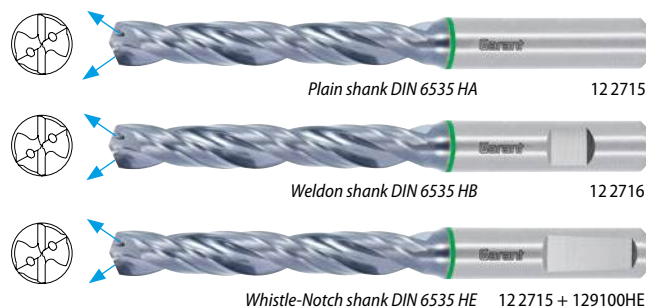
Garant GARANT Master Steel Speed solid carbide drill

Developed for use with **very high cutting speeds**. Outstandingly suitable for machines with **low power output** and high speeds.

- Clear reduction in cutting forces due to special cutter geometry.
- Coating for best wear resistance even at high process temperatures.
- Polished flutes for good chip clearance.

A **slim chisel edge** and the **special arrangement of the 4 guide chamfers** ensure **high positioning and alignment accuracy**. Optimised micro-geometry for increased working life and performance capability.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122716**.
Form **HE**: order with **No. 122715 + 129100HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
122715				220	200	180	170	90						75		160	130	●	●	●	●	●	●

Ø D _c h7	12 2715	L ₂	L	Ø D _s	f	Ø D _c h7	12 2715	L ₂	L	Ø D _s	f	Ø D _c h7	12 2715	L ₂	L	Ø D _s	f
	GARANT Master Steel Speed solid carbide drill, plain shank						GARANT Master Steel Speed solid carbide drill, plain shank						GARANT Master Steel Speed solid carbide drill, plain shank				
	DIN 6535 HA						DIN 6535 HA						DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.
2	eShop	18	57	4	0.09	6,3	eShop	43.6	91	8	0.22	10,7	eShop	55	118	12	0.28
2,05	eShop	18	57	4	0.09	6,4	eShop	43.4	91	8	0.22	10,8	eShop	54.8	118	12	0.28
2,1	eShop	17.9	57	4	0.09	6,5	eShop	43.3	91	8	0.22	10,9	eShop	54.7	118	12	0.28
2,2	eShop	17.7	57	4	0.09	6,6	eShop	43.1	91	8	0.22	11	eShop	54.5	118	12	0.28
2,3	eShop	17.6	57	4	0.09	6,7	eShop	43	91	8	0.22	11,1	eShop	54.4	118	12	0.28
2,4	eShop	17.4	57	4	0.09	6,8	eShop	42.8	91	8	0.22	11,2	eShop	54.2	118	12	0.28
2,5	eShop	17.3	57	4	0.09	6,9	eShop	42.7	91	8	0.22	11,3	eShop	54.1	118	12	0.28
2,6	eShop	17.1	57	4	0.09	7	eShop	42.5	91	8	0.22	11,35	eShop	53.9	118	12	0.28
2,7	eShop	17	57	4	0.09	7,1	eShop	42.4	91	8	0.22	11,4	eShop	53.9	118	12	0.28
2,8	eShop	16.8	57	4	0.09	7,2	eShop	42.2	91	8	0.22	11,5	eShop	53.8	118	12	0.28
2,9	eShop	16.7	57	4	0.09	7,3	eShop	42.1	91	8	0.22	11,6	eShop	53.6	118	12	0.28
3	eShop	23.5	66	6	0.12	7,4	eShop	41.9	91	8	0.22	11,7	eShop	53.5	118	12	0.28
3,1	eShop	23.4	66	6	0.12	7,45	eShop	41.9	91	8	0.22	11,8	eShop	53.3	118	12	0.28
3,2	eShop	23.2	66	6	0.12	7,5	eShop	41.8	91	8	0.22	11,9	eShop	53.2	118	12	0.28
3,25	eShop	23.1	66	6	0.12	7,6	eShop	41.6	91	8	0.22	12	eShop	53	118	12	0.28
3,3	eShop	23.1	66	6	0.12	7,7	eShop	41.5	91	8	0.22	12,2	eShop	58.7	124	14	0.31
3,4	eShop	22.9	66	6	0.12	7,8	eShop	41.3	91	8	0.22	12,5	eShop	58.3	124	14	0.31
3,5	eShop	22.8	66	6	0.12	7,9	eShop	41.2	91	8	0.22	12,8	eShop	57.8	124	14	0.31
3,6	eShop	22.6	66	6	0.12	8	eShop	41	91	8	0.22	13	eShop	57.5	124	14	0.31
3,7	eShop	22.5	66	6	0.12	8,1	eShop	48.9	103	10	0.26	13,2	eShop	57.2	124	14	0.31
3,8	eShop	30.3	74	6	0.12	8,2	eShop	48.7	103	10	0.26	13,5	eShop	56.8	124	14	0.31
3,9	eShop	30.2	74	6	0.12	8,3	eShop	48.6	103	10	0.26	13,8	eShop	56.3	124	14	0.31
4	eShop	30	74	6	0.12	8,4	eShop	48.4	103	10	0.26	14	eShop	56	124	14	0.31
4,1	eShop	29.9	74	6	0.16	8,5	eShop	48.3	103	10	0.26	14,2	eShop	61.7	133	16	0.34
4,2	eShop	29.7	74	6	0.16	8,6	eShop	48.1	103	10	0.26	14,5	eShop	61.3	133	16	0.34
4,3	eShop	29.6	74	6	0.16	8,7	eShop	48	103	10	0.26	14,8	eShop	60.8	133	16	0.34
4,4	eShop	29.4	74	6	0.16	8,8	eShop	47.8	103	10	0.26	15	eShop	60.5	133	16	0.34
4,5	eShop	29.3	74	6	0.16	8,9	eShop	47.7	103	10	0.26	15,1	eShop	60.4	133	16	0.34
4,6	eShop	29.1	74	6	0.16	9	eShop	47.5	103	10	0.26	15,2	eShop	60.2	133	16	0.34
4,65	eShop	29.1	74	6	0.16	9,1	eShop	47.4	103	10	0.26	15,25	eShop	60.2	133	16	0.34
4,7	eShop	29	74	6	0.16	9,2	eShop	47.2	103	10	0.26	15,5	eShop	59.8	133	16	0.34
4,8	eShop	36.8	82	6	0.16	9,3	eShop	47.1	103	10	0.26	15,8	eShop	59.3	133	16	0.34
4,9	eShop	36.7	82	6	0.16	9,35	eShop	47	103	10	0.26	16	eShop	59	133	16	0.34
5	eShop	36.5	82	6	0.16	9,4	eShop	46.9	103	10	0.26	16,2	eShop	68.7	143	18	0.35
5,1	eShop	36.4	82	6	0.19	9,5	eShop	46.8	103	10	0.26	16,5	eShop	68.3	143	18	0.35
5,2	eShop	36.2	82	6	0.19	9,55	eShop	46.7	103	10	0.26	16,8	eShop	67.8	143	18	0.35
5,3	eShop	36.1	82	6	0.19	9,6	eShop	46.6	103	10	0.26	17	eShop	67.5	143	18	0.35
5,4	eShop	35.9	82	6	0.19	9,7	eShop	46.5	103	10	0.26	17,2	eShop	67.2	143	18	0.35
5,5	eShop	35.8	82	6	0.19	9,8	eShop	46.3	103	10	0.26	17,5	eShop	66.8	143	18	0.35
5,55	eShop	35.7	82	6	0.19	9,9	eShop	46.2	103	10	0.26	17,8	eShop	66.3	143	18	0.35
5,6	eShop	35.6	82	6	0.19	10	eShop	46	103	10	0.26	18	eShop	66	143	18	0.35
5,7	eShop	35.5	82	6	0.19	10,1	eShop	55.9	118	12	0.28	18,2	eShop	73.7	153	20	0.38
5,8	eShop	35.3	82	6	0.19	10,2	eShop	55.7	118	12	0.28	18,5	eShop	73.3	153	20	0.38
5,9	eShop	35.2	82	6	0.19	10,3	eShop	55.6	118	12	0.28	19	eShop	72.5	153	20	0.38
6	eShop	35	82	6	0.19	10,4	eShop	55.4	118	12	0.28	19,2	eShop	72.2	153	20	0.38
6,1	eShop	43.9	91	8	0.22	10,5	eShop	55.3	118	12	0.28	19,5	eShop	71.8	153	20	0.38
6,2	eShop	43.7	91	8	0.22	10,6	eShop	55.1	118	12	0.28	20	eShop	71	153	20	0.38



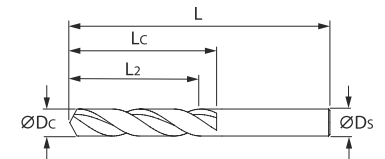
Garant GARANT Master Steel Feed solid carbide drill

3-flute drill, specially developed for use at **very high feed rates**. Outstandingly suitable for **machines with high installed power** and stable operating conditions.

- Special cutter geometry with stable cutting edges and large clearance at the centre enables very high feed rates.
- The patented tip is optimised for chip flow and generates low cutting pressure with good chip breakage.
- With 145° tip angle for low burr formation when drilling through holes.

The **sector-leading technology of the chisel edge** guarantees **optimum self-centring behaviour** and permits spot drilling on irregular surfaces. 3 guide chamfers guarantee a stable exit from the hole and an exact roundness of the hole.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122726**.
Form **HE**: order with **No. 122725 + 129100HE**.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	M	M	S	K	K						
12 2725				160	140	130	110	90	60			60	50	40	130	80	●		●	●		

Ø D _c h7	12 2725	L ₂	L	Ø D _s	f	Ø D _c h7	12 2725	L ₂	L	Ø D _s	f	Ø D _c h7	12 2725	L ₂	L	Ø D _s	f
(mm or inch)	GARANT Master Steel Feed solid carbide drill, plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.	(mm or inch)	GARANT Master Steel Feed solid carbide drill, plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.	(mm or inch)	GARANT Master Steel Feed solid carbide drill, plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.
4	eShop	30	74	6	0.28	7,9	eShop	41.2	91	8	0.37	11,9	eShop	53.2	118	12	0.5
4,1	eShop	29.9	74	6	0.28	8	eShop	41	91	8	0.37	12	eShop	53	118	12	0.5
4,2	eShop	29.7	74	6	0.28	8,1	eShop	48.9	103	10	0.44	12,2	eShop	58.7	124	14	0.56
4,3	eShop	29.6	74	6	0.28	8,2	eShop	48.7	103	10	0.44	12,5	eShop	58.3	124	14	0.56
4,4	eShop	29.4	74	6	0.28	8,3	eShop	48.6	103	10	0.44	12,55	eShop	58.2	124	14	0.56
4,5	eShop	29.3	74	6	0.28	8,4	eShop	48.4	103	10	0.44	1/2	eShop	58	124	14	0.56
4,6	eShop	29.1	74	6	0.28	8,5	eShop	48.3	103	10	0.44	12,7	eShop	58	124	14	0.56
4,65	eShop	29.1	74	6	0.28	8,6	eShop	48.1	103	10	0.44	12,8	eShop	57.8	124	14	0.56
4,7	eShop	29	74	6	0.28	8,7	eShop	48	103	10	0.44	13	eShop	57.5	124	14	0.56
3/16	eShop	36.9	82	6	0.28	8,8	eShop	47.8	103	10	0.44	13,1	eShop	57.4	124	14	0.56
4,8	eShop	36.8	82	6	0.28	8,9	eShop	47.7	103	10	0.44	13,2	eShop	57.2	124	14	0.56
4,9	eShop	36.7	82	6	0.28	9	eShop	47.5	103	10	0.44	13,3	eShop	57	124	14	0.56
5	eShop	36.5	82	6	0.28	9,1	eShop	47.4	103	10	0.44	13,5	eShop	56.8	124	14	0.56
5,1	eShop	36.4	82	6	0.32	9,2	eShop	47.2	103	10	0.44	13,8	eShop	56.3	124	14	0.56
5,2	eShop	36.2	82	6	0.32	9,25	eShop	47.1	103	10	0.44	14	eShop	56	124	14	0.56
5,3	eShop	36.1	82	6	0.32	9,3	eShop	47.1	103	10	0.44	14,1	eShop	61.9	133	16	0.61
5,4	eShop	35.9	82	6	0.32	9,35	eShop	47	103	10	0.44	14,2	eShop	61.7	133	16	0.61
5,5	eShop	35.8	82	6	0.32	9,4	eShop	46.9	103	10	0.44	9/16	eShop	61.6	133	16	0.61
5,55	eShop	35.7	82	6	0.32	9,5	eShop	46.8	103	10	0.44	14,5	eShop	61.3	133	16	0.61
5,6	eShop	35.6	82	6	0.32	9,55	eShop	46.7	103	10	0.44	14,8	eShop	60.8	133	16	0.61
5,7	eShop	35.5	82	6	0.32	9,6	eShop	46.6	103	10	0.44	15	eShop	60.5	133	16	0.61
5,8	eShop	35.3	82	6	0.32	9,7	eShop	46.5	103	10	0.44	15,1	eShop	60.4	133	16	0.61
5,9	eShop	35.2	82	6	0.32	9,8	eShop	46.3	103	10	0.44	15,2	eShop	60.2	133	16	0.61
6	eShop	35	82	6	0.32	9,9	eShop	46.2	103	10	0.44	15,25	eShop	60.2	133	16	0.61
6,1	eShop	43.9	91	8	0.37	10	eShop	46	103	10	0.44	15,35	eShop	60	133	16	0.61
6,2	eShop	43.7	91	8	0.37	10,1	eShop	55.9	118	12	0.5	15,5	eShop	59.8	133	16	0.61
6,3	eShop	43.6	91	8	0.37	10,2	eShop	55.7	118	12	0.5	15,8	eShop	59.3	133	16	0.61
1/4	eShop	43.5	91	8	0.37	10,3	eShop	55.6	118	12	0.5	5/8	eShop	59.2	133	16	0.61
6,35	eShop	43.4	91	8	0.37	13/32	eShop	55.6	118	12	0.5	16	eShop	59	133	16	0.61
6,4	eShop	43.4	91	8	0.37	10,4	eShop	55.4	118	12	0.5	16,05	eShop	68.9	143	18	0.61
6,5	eShop	43.3	91	8	0.37	10,5	eShop	55.3	118	12	0.5	16,2	eShop	68.7	143	18	0.66
6,6	eShop	43.1	91	8	0.37	10,6	eShop	55.1	118	12	0.5	16,5	eShop	68.3	143	18	0.66
6,7	eShop	43	91	8	0.37	10,7	eShop	55	118	12	0.5	16,8	eShop	67.8	143	18	0.66
6,8	eShop	42.8	91	8	0.37	10,8	eShop	54.8	118	12	0.5	17	eShop	67.5	143	18	0.66
6,9	eShop	42.7	91	8	0.37	10,9	eShop	54.7	118	12	0.5	17,2	eShop	67.2	143	18	0.66
7	eShop	42.5	91	8	0.37	11	eShop	54.5	118	12	0.5	17,5	eShop	66.8	143	18	0.66
7,1	eShop	42.4	91	8	0.37	11,1	eShop	54.4	118	12	0.5	17,8	eShop	66.3	143	18	0.66
9/32	eShop	42.3	91	8	0.37	7/16	eShop	54.4	118	12	0.5	18	eShop	66	143	18	0.66
7,2	eShop	42.2	91	8	0.37	11,2	eShop	54.2	118	12	0.5	18,2	eShop	73.7	153	20	0.69
7,3	eShop	42.1	91	8	0.37	11,3	eShop	54.1	118	12	0.5	18,5	eShop	73.3	153	20	0.69
7,4	eShop	41.9	91	8	0.37	11,35	eShop	54	118	12	0.5	18,8	eShop	72.8	153	20	0.69
7,45	eShop	41.9	91	8	0.37	11,4	eShop	53.9	118	12	0.5	18,9	eShop	72.7	153	20	0.69
7,5	eShop	41.8	91	8	0.37	11,5	eShop	53.8	118	12	0.5	19	eShop	72.5	153	20	0.69
7,55	eShop	41.7	91	8	0.37	11,55	eShop	53.7	118	12	0.5	19,2	eShop	72.2	153	20	0.69
7,6	eShop	41.6	91	8	0.37	11,6	eShop	53.6	118	12	0.5	19,5	eShop	71.8	153	20	0.69
7,7	eShop	41.5	91	8	0.37	11,7	eShop	53.5	118	12	0.5	19,8	eShop	71.3	153	20	0.69
7,8	eShop	41.3	91	8	0.37	11,8	eShop	53.3	118	12	0.5	20	eShop	71	153	20	0.69



Garant Solid carbide HPC pilot drill with 4 cooling channels

Cutting chisel edge with **high centring accuracy** due to **strong core and special point geometry**. High roundness and alignment accuracy of the deep hole, thanks to **4 guide chamfers**. Outstanding chip evacuation due to **4 internal cooling channels** from Ø 3.8 mm. Up to 3.7 mm Ø with 2 internal cooling channels. With **140° point angle** and special **j6 cutting edge tolerance** for optimum generation of a pilot hole.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

For deep-hole drilling deeper than $12 \times D$ a pilot hole is recommended, and for deep-hole drilling from $20 \times D$ to $30 \times D$ it is essential.

The generation of a pilot hole improves process reliability.

Form HB and HE supplied at the same price as HA.

Form **HB**: order with **No. 122738**.

Form **HE**: order with **No. 122736 + 129100HE**.



Plain shank DIN 6535 HA

12 2736

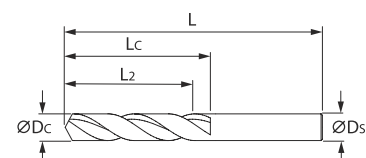


Weldon shank DIN 6535 HB

12 2738



Whistle-notch shank DIN 6535 HE 12 2736 + 129100HE



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
12 2736				170	130	120	110	65						75	70	95							

Ø D _c p6	12 2736	L ₂	L	Ø D _s	f	Ø D _c p6	12 2736	L ₂	L	Ø D _s	f
	Solid carbide HPC drill plain shank						Solid carbide HPC drill plain shank				
	DIN 6535 HA						DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.
2	eShop	18	57	4	0.07	6,8	eShop	42.8	91	8	0.21
2,2	eShop	17.7	57	4	0.08	7	eShop	42.5	91	8	0.21
2,3	eShop	17.6	57	4	0.08	7,5	eShop	41.8	91	8	0.21
2,4	eShop	17.4	57	4	0.08	7,8	eShop	41.3	91	8	0.21
2,5	eShop	17.3	57	4	0.08	8	eShop	41	91	8	0.21
2,7	eShop	17	57	4	0.08	8,2	eShop	48.7	103	10	0.27
2,8	eShop	16.8	57	4	0.08	8,5	eShop	48.3	103	10	0.27
3	eShop	23.5	66	6	0.08	8,8	eShop	47.8	103	10	0.27
3,2	eShop	23.2	66	6	0.08	9	eShop	47.5	103	10	0.27
3,3	eShop	23.1	66	6	0.08	9,5	eShop	46.8	103	10	0.27
3,4	eShop	22.9	66	6	0.08	9,8	eShop	46.3	103	10	0.27
3,5	eShop	22.8	66	6	0.08	10	eShop	46	103	10	0.27
3,7	eShop	22.5	66	6	0.08	10,2	eShop	55.7	118	12	0.27
3,8	eShop	30.3	74	6	0.08	10,5	eShop	55.3	118	12	0.27
4	eShop	30	74	6	0.15	10,8	eShop	54.8	118	12	0.27
4,2	eShop	29.7	74	6	0.15	11	eShop	54.5	118	12	0.27
4,3	eShop	29.5	74	6	0.15	11,5	eShop	53.8	118	12	0.27
4,5	eShop	29.3	74	6	0.15	11,8	eShop	53.3	118	12	0.27
4,8	eShop	36.8	82	6	0.15	12	eShop	53	118	12	0.27
5	eShop	36.5	82	6	0.15	13	eShop	57.5	124	14	0.32
5,5	eShop	35.8	82	6	0.21	13,5	eShop	56.8	124	14	0.32
5,8	eShop	35.3	82	6	0.21	13,8	eShop	56.3	124	14	0.32
6	eShop	35	82	6	0.21	14	eShop	56	124	14	0.32
6,3	eShop	43.6	91	8	0.21	14,8	eShop	60.8	133	16	0.32
6,5	eShop	43.3	91	8	0.21	15,8	eShop	59.3	133	16	0.32
6,6	eShop	43.1	91	8	0.21	16	eShop	59	133	16	0.32



Garant GARANT Master Steel solid carbide high-performance drill

Robust drill design and optimised special point geometry for the **best possible chip formation and reliable chip breakage** with **higher feed rates at the same time. Advanced micro-geometry, convex cutting edge and relieved cone** to provide additional stability for the main cutting edge.

Optimised flute geometry and patented face geometry for **reliable chip evacuation** in steel materials and cast material. **High-performance coating** of the latest generation.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

HB and HE shanks are available at the same price as HA.

HB shanks: order with **No. 122762**.

For **HE shanks:** use order **No. 122761 + 129100HE**.

Articles with prices in brackets: Delivery time approx. 8 weeks, minimum order quantity 3 pieces.



Plain shank DIN 6535 HA

122761

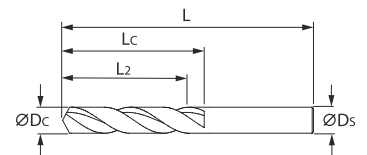


Weldon shank DIN 6535 HB

122762



Whistle-Notch shank DIN 6535 HE 122761 + 129100HE



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG < 900 N	GGG > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
122761				170	155	145	130	110	60					55	45	130	90						

Ø D _c h7	122761	L ₂	L	Ø D _s	f
	GARANT Master Steel solid carbide high-performance drill, plain shank				
	DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.
3	eShop	23.5	66	6	0.12
3,1	eShop	23.4	66	6	0.12
3,2	eShop	23.2	66	6	0.12
3,25	(eShop)	23.2	66	6	0.12
3,3	eShop	23.1	66	6	0.13
3,4	eShop	22.9	66	6	0.13
3,5	eShop	22.8	66	6	0.13
3,7	eShop	22.5	66	6	0.14
3,8	eShop	30.3	74	6	0.14
3,9	eShop	30.2	74	6	0.15
4	eShop	30	74	6	0.15
4,1	eShop	29.9	74	6	0.15
4,2	eShop	29.7	74	6	0.16
4,3	eShop	29.6	74	6	0.16
4,5	eShop	29.3	74	6	0.16
4,6	eShop	29.1	74	6	0.17
4,65	(eShop)	29.1	74	6	0.17
4,7	eShop	29	74	6	0.17
4,8	eShop	35.8	82	6	0.17
4,9	eShop	36.7	82	6	0.18
5	eShop	36.5	82	6	0.18
5,1	eShop	36.4	82	6	0.18
5,2	eShop	36.2	82	6	0.18
5,3	eShop	36.1	82	6	0.19
5,5	eShop	35.8	82	6	0.19
5,55	(eShop)	35.8	82	6	0.19
5,6	eShop	35.6	82	6	0.2
5,7	eShop	35.5	82	6	0.2
5,8	eShop	35.3	82	6	0.2
5,9	eShop	35.2	82	6	0.2
6	eShop	35	82	6	0.21
6,1	eShop	43.9	91	8	0.21
6,2	eShop	43.7	91	8	0.21
6,3	eShop	43.6	91	8	0.22
6,4	eShop	43.4	91	8	0.22
6,5	eShop	43.3	91	8	0.22
6,6	eShop	43.1	91	8	0.22
6,8	eShop	42.8	91	8	0.23
6,9	eShop	42.7	91	8	0.23
7	eShop	42.5	91	8	0.23
7,2	eShop	42.2	91	8	0.24
7,3	eShop	42.1	91	8	0.24
7,45	(eShop)	42.1	91	8	0.24
7,5	eShop	41.8	91	8	0.25
7,8	eShop	41.3	91	8	0.25
7,9	eShop	41.2	91	8	0.26
8	eShop	41	91	8	0.26
8,1	eShop	48.9	103	10	0.26

Ø D _c h7	122761	L ₂	L	Ø D _s	f
	GARANT Master Steel solid carbide high-performance drill, plain shank				
	DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.
8,2	eShop	48.7	103	10	0.26
8,3	eShop	48.6	103	10	0.27
8,5	eShop	48.3	103	10	0.27
8,6	eShop	48.1	103	10	0.27
8,7	eShop	48	103	10	0.28
8,8	eShop	47.8	103	10	0.28
9	eShop	47.5	103	10	0.28
9,2	eShop	47.2	103	10	0.29
9,3	eShop	47.1	103	10	0.29
9,35	(eShop)	47.1	103	10	0.29
9,4	eShop	46.9	103	10	0.29
9,5	eShop	46.8	103	10	0.29
9,8	eShop	46.3	103	10	0.3
10	eShop	46	103	10	0.3
10,2	eShop	55.7	118	12	0.31
10,3	eShop	55.6	118	12	0.31
10,5	eShop	55.3	118	12	0.32
10,8	eShop	54.8	118	12	0.32
11	eShop	54.5	118	12	0.33
11,2	eShop	54.2	118	12	0.33
11,5	eShop	53.8	118	12	0.33
11,8	eShop	53.3	118	12	0.34
12	eShop	53	118	12	0.34
12,2	eShop	57.7	124	14	0.35
12,5	eShop	58.3	124	14	0.35
13	eShop	57.5	124	14	0.36
13,1	(eShop)	57.5	124	14	0.36
13,5	eShop	56.8	124	14	0.37
13,8	eShop	56.3	124	14	0.37
14	eShop	56	124	14	0.38
14,2	eShop	61.7	133	16	0.38
14,5	eShop	61.3	133	16	0.38
14,8	eShop	60.8	133	16	0.39
15	eShop	60.5	133	16	0.39
15,1	(eShop)	60.5	133	16	0.39
15,2	eShop	60.2	133	16	0.39
15,5	eShop	59.8	133	16	0.4
15,8	eShop	59.3	133	16	0.4
16	eShop	59	133	16	0.4
16,5	eShop	68.3	143	18	0.41
17	eShop	67.5	143	18	0.41
17,5	eShop	66.8	143	18	0.42
18	eShop	66	143	18	0.42
18,5	eShop	73.3	155	20	0.43
18,9	(eShop)	72.5	155	20	0.43
19	eShop	72.5	155	20	0.43
19,5	eShop	71.8	155	20	0.43
20	eShop	71	155	20	0.44



12



HOLEX Solid carbide high performance drill

Tool specially matched to drilling holes without through-coolant. **Concave major cutting edges** and a **special flute profile** ensure a good chip evacuation. The sturdy cutter geometry with **special point geometry** and 4 cutting edges ensures drilling with good process reliability. A wide range of applications in steel materials thanks to a combination of tough ultra-fine grain carbide and extremely **wear-resistant** and **heat-resistant coating**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122772**.
Form **HE**: order with **No. 122773**.



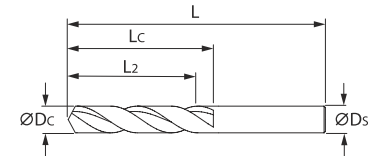
Plain shank DIN 6535 HA 122771



Weldon shank DIN 6535 HB 122772



Whistle-Notch shank DIN 6535 HE 122773



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX > 900 N	INOX > 900 N	GG > 900 N	GGG	Uni					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
12 2771		200	160	110	90	80	70	60							90	60						

Ø D _c m7	12F 12 2771	L ₂	L	Ø D _s	f	Ø D _c m7	12F 12 2771	L ₂	L	Ø D _s	f	Ø D _c m7	12F 12 2771	L ₂	L	Ø D _s	f
	Solid carbide drill plain shank						Solid carbide drill plain shank						Solid carbide drill plain shank				
	DIN 6535 HA						DIN 6535 HA						DIN 6535 HA				
	AlTiN-Si	mm	mm	mm	mm/rev.		AlTiN-Si	mm	mm	mm	mm/rev.		AlTiN-Si	mm	mm	mm	mm/rev.
1	eShop	6.5	55	3	0.05	5.3	eShop	36.1	82	6	0.18	9.35	eShop	47	103	10	0.2
1.1	eShop	10.4	55	3	0.05	5.4	eShop	35.9	82	6	0.18	9.4	eShop	46.9	103	10	0.2
1.2	eShop	10.2	55	3	0.05	5.5	eShop	35.8	82	6	0.18	9.5	eShop	46.8	103	10	0.2
1.3	eShop	10.1	55	3	0.05	5.55	eShop	35.7	82	6	0.18	3/8	eShop	46.7	103	10	0.2
1.4	eShop	9.9	55	3	0.05	7/32	eShop	35.7	82	6	0.18	9.6	eShop	46.6	103	10	0.2
1.5	eShop	13.8	55	3	0.05	5.6	eShop	35.6	82	6	0.18	9.7	eShop	46.5	103	10	0.2
1/16	eShop	13.6	55	3	0.05	5.7	eShop	35.5	82	6	0.18	9.8	eShop	46.3	103	10	0.2
1.6	eShop	13.6	55	3	0.05	5.8	eShop	35.3	82	6	0.18	9.9	eShop	46.2	103	10	0.2
1.7	eShop	13.5	55	3	0.07	5.9	eShop	35.2	82	6	0.18	10	eShop	46	103	10	0.2
1.8	eShop	13.3	55	3	0.07	6	eShop	35	82	6	0.18	10.2	eShop	55.7	118	12	0.2
1.9	eShop	13.2	55	3	0.07	6.1	eShop	43.9	91	8	0.18	10.3	eShop	55.6	118	12	0.2
2	eShop	18	57	4	0.07	6.2	eShop	43.7	91	8	0.18	13/32	eShop	55.5	118	12	0.2
2.1	eShop	17.9	57	4	0.07	6.3	eShop	43.6	91	8	0.18	10.5	eShop	55.3	118	12	0.2
2.2	eShop	17.7	57	4	0.07	6.35	eShop	43.5	91	8	0.18	10.8	eShop	54.8	118	12	0.2
2.3	eShop	17.6	57	4	0.07	1/4	eShop	43.5	91	8	0.18	11	eShop	54.5	118	12	0.2
3/32	eShop	17.4	57	4	0.09	6.4	eShop	43.4	91	8	0.18	7/16	eShop	54.3	118	12	0.2
2.4	eShop	17.4	57	4	0.09	6.5	eShop	43.3	91	8	0.18	11.2	eShop	54.2	118	12	0.2
2.5	eShop	17.3	57	4	0.09	6.6	eShop	43.1	91	8	0.18	11.5	eShop	53.8	118	12	0.2
2.6	eShop	17.1	57	4	0.09	6.7	eShop	43	91	8	0.18	11.8	eShop	53.3	118	12	0.2
2.7	eShop	17	57	4	0.11	6.8	eShop	42.8	91	8	0.18	12	eShop	53	118	12	0.2
2.8	eShop	16.8	57	4	0.11	6.9	eShop	42.7	91	8	0.18	12.2	eShop	58.7	124	14	0.26
2.9	eShop	16.7	57	4	0.11	7	eShop	42.5	91	8	0.18	12.5	eShop	58.3	124	14	0.26
3	eShop	23.5	66	6	0.16	7.1	eShop	42.4	91	8	0.18	12.7	eShop	58	124	14	0.26
3.1	eShop	23.4	66	6	0.16	9/32	eShop	42.3	91	8	0.18	1/2	eShop	58	124	14	0.26
1/8	eShop	23.2	66	6	0.16	7.2	eShop	42.2	91	8	0.18	12.8	eShop	57.8	124	14	0.26
3.2	eShop	23.2	66	6	0.16	7.3	eShop	42.1	91	8	0.18	13	eShop	57.5	124	14	0.26
3.3	eShop	23.1	66	6	0.16	7.4	eShop	41.9	91	8	0.18	13.2	eShop	57.2	124	14	0.26
3.4	eShop	22.9	66	6	0.16	7.45	eShop	41.8	91	8	0.18	13.5	eShop	56.8	124	14	0.26
3.5	eShop	22.8	66	6	0.16	7.5	eShop	41.8	91	8	0.18	13.8	eShop	56.3	124	14	0.26
3.6	eShop	22.6	66	6	0.16	7.6	eShop	41.6	91	8	0.18	14	eShop	56	124	14	0.26
3.7	eShop	22.5	66	6	0.16	7.7	eShop	41.5	91	8	0.18	14.2	eShop	61.7	133	16	0.26
3.8	eShop	30.3	74	6	0.16	7.8	eShop	41.3	91	8	0.18	9/16	eShop	61.6	133	16	0.26
3.9	eShop	30.2	74	6	0.16	7.9	eShop	41.2	91	8	0.18	14.5	eShop	61.3	133	16	0.26
5/32	eShop	30	74	6	0.16	5/16	eShop	41.1	91	8	0.18	14.8	eShop	60.8	133	16	0.26
4	eShop	30	74	6	0.16	8	eShop	41	91	8	0.18	15	eShop	60.5	133	16	0.26
4.1	eShop	29.9	74	6	0.16	8.1	eShop	48.9	103	10	0.2	15.1	eShop	60.4	133	16	0.26
4.2	eShop	29.7	74	6	0.16	8.2	eShop	48.7	103	10	0.2	15.2	eShop	60.2	133	16	0.26
4.3	eShop	29.6	74	6	0.16	8.3	eShop	48.6	103	10	0.2	15.5	eShop	59.8	133	16	0.26
4.4	eShop	29.4	74	6	0.16	8.4	eShop	48.4	103	10	0.2	15.8	eShop	59.3	133	16	0.26
4.5	eShop	29.3	74	6	0.16	8.5	eShop	48.3	103	10	0.2	5/8	eShop	59.2	133	16	0.26
4.6	eShop	29.1	74	6	0.16	8.6	eShop	48.1	103	10	0.2	16	eShop	59	133	16	0.26
4.65	eShop	29	74	6	0.16	8.7	eShop	48	103	10	0.2	16.5	eShop	68.3	143	18	0.28
4.7	eShop	29	74	6	0.16	11/32	eShop	47.9	103	10	0.2	17	eShop	67.5	143	18	0.28
3/16	eShop	36.9	82	6	0.16	8.8	eShop	47.8	103	10	0.2	17.5	eShop	66.8	143	18	0.28
4.8	eShop	36.8	82	6	0.16	8.9	eShop	47.7	103	10	0.2	18	eShop	66	143	18	0.28
4.9	eShop	36.7	82	6	0.16	9	eShop	47.5	103	10	0.2	18.5	eShop	73.3	153	20	0.28
5	eShop	36.5	82	6	0.16	9.1	eShop	47.4	103	10	0.2	19	eShop	72.5	153	20	0.28
5.1	eShop	36.4	82	6	0.18	9.2	eShop	47.2	103	10	0.2	19.5	eShop	71.8	153	20	0.28
5.2	eShop	36.2	82	6	0.18	9.3	eShop	47.1	103	10	0.2	20	eShop	71	153	20	0.28



HOLEX Pro Steel solid carbide high-performance drill

Straight major cutting edges and a **special flute profile** ensure a good chip evacuation. The robust cutter geometry ensures high-performance drilling with good process reliability. A wide range of applications in steel materials thanks to a combination of tough ultra-fine grain carbide and an extremely wear-resistant coating.

Up to Ø 1.9 with 4 facets, from Ø 2 with relieved cone.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
 Versions with HB and HE shank available at the same price as HA.
 For **HB shanks**: use order no. **122777**.
 For **HE shanks**: use order No. **122778**.



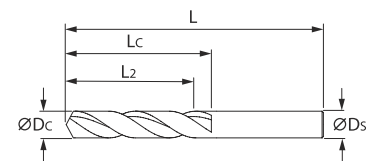
Plain shank DIN 6535 HA 122776



Weldon shank DIN 6535 HB 122777



Whistle-Notch shank DIN 6535 HE 122778



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG < 900 N	GGG < 900 N	Uni	Oil	Water	Emulsion	High Pressure	High Speed
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K	65					
12 2776	250	200	160	125	115	95	90	65						35	30	100	65						

Ø D _c h7	12 2776	L ₂	L	Ø D _s	f
(mm or inch)	HOLEX Pro Steel solid carbide drill, plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.
1	eShop	6.5	45	4	0.05
1,1	eShop	7.4	45	4	0.05
1,2	eShop	7.7	45	4	0.05
1,25	eShop	8.6	45	4	0.05
1,3	eShop	8.6	45	4	0.05
1,4	eShop	8.9	45	4	0.05
1,45	eShop	9.8	50	4	0.05
1,5	eShop	9.8	50	4	0.05
1/16	eShop	10.7	50	4	0.05
1,6	eShop	10.6	50	4	0.05
1,7	eShop	11	50	4	0.07
1,8	eShop	11.8	50	4	0.07
1,85	eShop	12.2	50	4	0.07
1,9	eShop	12.2	50	4	0.07
2	eShop	13	50	4	0.07
2,05	eShop	13.9	55	4	0.07
2,1	eShop	13.9	55	4	0.07
2,2	eShop	14.2	55	4	0.07
2,3	eShop	15.1	55	4	0.09
3/32	eShop	15.5	55	4	0.09
2,4	eShop	15.4	55	4	0.09
2,5	eShop	16.3	55	4	0.09
2,6	eShop	17.1	55	4	0.09
2,7	eShop	17.5	55	4	0.09
2,8	eShop	18.3	55	4	0.11
2,9	eShop	18.7	55	4	0.11
3	eShop	23.5	66	6	0.11
3,1	eShop	23.4	66	6	0.11
1/8	eShop	23.3	66	6	0.11
3,2	eShop	23.2	66	6	0.11
3,25	eShop	23.1	66	6	0.11

Ø D _c h7	12 2776	L ₂	L	Ø D _s	f
(mm or inch)	HOLEX Pro Steel solid carbide drill, plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.
3,3	eShop	23.1	66	6	0.11
3,4	eShop	22.9	66	6	0.11
3,5	eShop	22.8	66	6	0.11
3,6	eShop	22.6	66	6	0.11
3,7	eShop	22.5	66	6	0.11
3,8	eShop	30.3	74	6	0.11
3,9	eShop	30.2	74	6	0.11
5/32	eShop	30.1	74	6	0.11
4	eShop	30	74	6	0.14
4,1	eShop	29.9	74	6	0.14
4,2	eShop	29.7	74	6	0.14
4,3	eShop	29.6	74	6	0.14
4,4	eShop	29.4	74	6	0.14
4,5	eShop	29.3	74	6	0.14
4,6	eShop	29.1	74	6	0.14
4,65	eShop	29.1	74	6	0.14
4,7	eShop	29	74	6	0.14
3/16	eShop	36.9	82	6	0.14
4,8	eShop	36.8	82	6	0.14
4,9	eShop	36.7	82	6	0.14
5	eShop	36.5	82	6	0.14
5,1	eShop	36.4	82	6	0.14
5,2	eShop	36.2	82	6	0.14
5,3	eShop	36.1	82	6	0.14
5,4	eShop	35.9	82	6	0.14
5,5	eShop	35.8	82	6	0.14
5,55	eShop	35.7	82	6	0.14
7/32	eShop	35.7	82	6	0.14
5,6	eShop	35.6	82	6	0.14
5,7	eShop	35.5	82	6	0.14
5,8	eShop	35.3	82	6	0.14

$\varnothing D_c$ h7	12F 12 2776	L_2	L	$\varnothing D_s$	 f
	HOLEX Pro Steel solid carbide drill, plain shank				
(mm or inch)	DIN 6535 HA				
	TiAlN	mm	mm	mm	mm/rev.
5,9	eShop	35.2	82	6	0.14
6	eShop	35	82	6	0.14
6,1	eShop	43.9	91	8	0.18
6,2	eShop	43.7	91	8	0.18
6,3	eShop	43.6	91	8	0.18
1/4	eShop ■	43.5	91	8	0.18
6,35	eShop	43.5	91	8	0.18
6,4	eShop	43.4	91	8	0.18
6,5	eShop	43.3	91	8	0.18
6,6	eShop	43.1	91	8	0.18
6,7	eShop	43	91	8	0.18
6,8	eShop	42.8	91	8	0.18
6,9	eShop	42.7	91	8	0.18
7	eShop	42.5	91	8	0.18
7,1	eShop	42.4	91	8	0.18
9/32	eShop ■	42.3	91	8	0.18
7,2	eShop	42.2	91	8	0.18
7,3	eShop	42.1	91	8	0.18
7,4	eShop	41.9	91	8	0.18
7,45	eShop	41.9	91	8	0.18
7,5	eShop	41.8	91	8	0.18
7,55	eShop	41.7	91	8	0.18
7,6	eShop	41.6	91	8	0.18
7,7	eShop	41.5	91	8	0.18
7,8	eShop	41.3	91	8	0.18
7,9	eShop	41.2	91	8	0.18
5/16	eShop ■	41.1	91	8	0.18
8	eShop ■	41	91	8	0.18
8,1	eShop	48.9	103	10	0.2
8,2	eShop	48.7	103	10	0.2
8,3	eShop	48.6	103	10	0.2
8,4	eShop	48.4	103	10	0.2
8,5	eShop ■	48.3	103	10	0.2
8,6	eShop	48.1	103	10	0.2
8,7	eShop	48	103	10	0.2
11/32	eShop ■	48	103	10	0.2
8,8	eShop	47.8	103	10	0.2
8,9	eShop	47.7	103	10	0.2
9	eShop ■	47.5	103	10	0.2
9,1	eShop	47.4	103	10	0.22
9,2	eShop	47.2	103	10	0.22
9,25	eShop	47.1	103	10	0.22
9,3	eShop	47.1	103	10	0.22
9,35	eShop	47	103	10	0.22
9,4	eShop	46.9	103	10	0.22
9,5	eShop	46.8	103	10	0.22
3/8	eShop ■	46.8	103	10	0.22
9,55	eShop	46.7	103	10	0.22
9,6	eShop	46.6	103	10	0.22
9,7	eShop	46.5	103	10	0.22
9,8	eShop	46.3	103	10	0.22
9,9	eShop	46.2	103	10	0.22
10	eShop ■	46	103	10	0.22
10,1	eShop	55.9	118	12	0.22
10,2	eShop	55.7	118	12	0.22
10,3	eShop	55.6	118	12	0.22
13/32	eShop ■	55.6	118	12	0.22
10,4	eShop	55.4	118	12	0.22
10,5	eShop ■	55.3	118	12	0.22
10,6	eShop	55.1	118	12	0.22
10,7	eShop	55	118	12	0.22
10,8	eShop	54.8	118	12	0.22
10,9	eShop	54.7	118	12	0.22
11	eShop ■	54.5	118	12	0.22

$\varnothing D_c$ h7	12F 12 2776	L_2	L	$\varnothing D_s$	 f
	HOLEX Pro Steel solid carbide drill, plain shank				
(mm or inch)	DIN 6535 HA				
	TiAlN	mm	mm	mm	mm/rev.
11,1	eShop	54.4	118	12	0.22
7/16	eShop ■	54.4	118	12	0.22
11,2	eShop	54.2	118	12	0.22
11,3	eShop	54.1	118	12	0.22
11,35	eShop	54	118	12	0.22
11,4	eShop	53.9	118	12	0.22
11,5	eShop	53.8	118	12	0.22
11,55	eShop	53.7	118	12	0.22
11,6	eShop	53.6	118	12	0.22
11,7	eShop	53.5	118	12	0.22
11,8	eShop	53.3	118	12	0.22
11,9	eShop	53.2	118	12	0.22
12	eShop	53	118	12	0.22
12,2	eShop	58.7	124	14	0.26
12,5	eShop ■	58.3	124	14	0.26
12,55	eShop	58.2	124	14	0.26
1/2	eShop ■	58	124	14	0.26
12,7	eShop	58	124	14	0.26
12,8	eShop	57.8	124	14	0.26
13	eShop	57.5	124	14	0.26
13,1	eShop	57.4	124	14	0.26
13,2	eShop	57.2	124	14	0.26
13,3	eShop	57	124	14	0.26
13,5	eShop ■	56.8	124	14	0.26
13,8	eShop	56.3	124	14	0.26
14	eShop ■	56	124	14	0.26
14,1	eShop	61.9	133	16	0.26
14,2	eShop	61.7	133	16	0.26
9/16	eShop ■	61.6	133	16	0.26
14,5	eShop	61.3	133	16	0.26
14,8	eShop	60.8	133	16	0.26
15	eShop	60.5	133	16	0.26
19/32	eShop ■	60.4	133	16	0.26
15,1	eShop	60.4	133	16	0.26
15,2	eShop	60.2	133	16	0.26
15,25	eShop	60.1	133	16	0.26
15,35	eShop	60	133	16	0.26
15,5	eShop ■	59.8	133	16	0.26
15,8	eShop	59.3	133	16	0.26
5/8	eShop ■	59.2	133	16	0.26
16	eShop	59	133	16	0.26
16,05	eShop	68.9	143	18	0.26
16,2	eShop	68.7	143	18	0.28
16,5	eShop	68.3	143	18	0.28
21/32	eShop ■	68	143	18	0.28
16,8	eShop	67.8	143	18	0.28
17	eShop	67.5	143	18	0.28
17,2	eShop	67.2	143	18	0.28
11/16	eShop ■	66.9	143	18	0.28
17,5	eShop	66.8	143	18	0.28
17,8	eShop	66.3	143	18	0.28
18	eShop	66	143	18	0.28
18,2	eShop	73.7	153	20	0.28
18,5	eShop	73.3	153	20	0.28
18,8	eShop	72.8	153	20	0.28
18,9	eShop	72.7	153	20	0.28
19	eShop	72.5	153	20	0.28
3/4	eShop ■	72.5	153	20	0.28
19,05	eShop	72.5	153	20	0.28
19,2	eShop	72.2	153	20	0.28
19,5	eShop	71.8	153	20	0.28
19,8	eShop	71.3	153	20	0.28
20	eShop	71	153	20	0.28

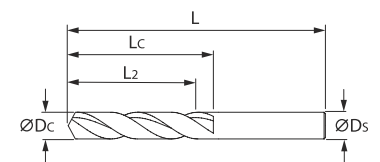
H7	Solid carbide	DIN 6537 L	6xD	2	140°	h6 DIN 6535 HA	25 bar	HPC
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Garant Solid carbide HPC precision drills for H7 fit

Drilling and reaming in a single operation. Cutting chisel edge with **high centring accuracy** due to **strong core and special point geometry**. Particularly high alignment accuracy due to **4 guide chamfers**.

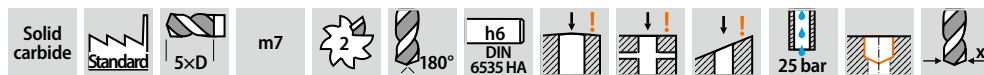
Advantage: Very tight **manufacturing tolerances** with **H7 fit** can be produced without additional reaming.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Solid carbide precision fit drills for machining aluminium available on request.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122790 + 129100HB**.
Form **HE**: order with **No. 122790 + 129100HE**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	N						
12 2790				120	100	85	60	P	H	H	H	H	35	30								

Ø D _c	12 2790	L ₂	L	Ø D _s	f
	Solid carbide HPC drill plain shank				
	DIN 6535 HA H7				
mm	TiAlN	mm	mm	mm	mm/rev.
3H7	eShop	23.5	66	6	0.09
3,98	eShop	30.1	74	6	0.12
3,99	eShop	30.1	74	6	0.12
4H7	eShop	30	74	6	0.12
4,01	eShop	30	74	6	0.12
4,02	eShop	30	74	6	0.12
4,98	eShop	36.6	82	6	0.16
4,99	eShop	36.6	82	6	0.16
5H7	eShop	36.5	82	6	0.16
5,01	eShop	36.5	82	6	0.16
5,02	eShop	36.5	82	6	0.16
5,98	eShop	35.1	82	6	0.16
5,99	eShop	35.1	82	6	0.16
6H7	eShop	35	82	6	0.16
6,01	eShop	35	82	6	0.16
6,02	eShop	35	82	6	0.16
7H7	eShop	42.5	91	8	0.22
7,98	eShop	41.1	91	8	0.22
7,99	eShop	41.1	91	8	0.22
8H7	eShop	41	91	8	0.22
8,01	eShop	41	91	8	0.22
8,02	eShop	41	91	8	0.22
9H7	eShop	47.5	103	10	0.28
9,98	eShop	46.1	103	10	0.28
9,99	eShop	46.1	103	10	0.28
10H7	eShop	46	103	10	0.28
10,01	eShop	46	103	10	0.28
10,02	eShop	46	103	10	0.28
12H7	eShop	53	118	12	0.34
14H7	eShop	56	124	14	0.34



Garant Solid carbide drill 180°

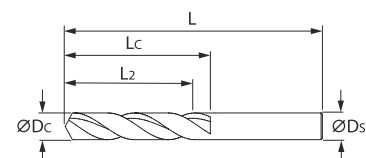
Special point geometry for generating **180° flat-bottomed holes**. Low radial forces even when spot drilling on faces with up to 15° slope. Flute geometry for optimum chip evacuation. With 4 guide chamfers to stabilise the drill in the hole.

Advantage: The **180° point angle** permits drilling and counterboring in a single operation.

Recommendation: When using the solid carbide 180° drill it is absolutely essential for process reliability:

- **When spot drilling on flat surfaces** to drill a pilot hole 1xD using pilot drill No. 122736.
- **When spot drilling on sloping surfaces** up to max. 15°: **reduce** the feed rate f to **25%** of the stated value. **After spot drilling**, the **normal feed rate value** can be used.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122793 + 129100HB**.
Form **HE**: order with **No. 122793 + 129100HE**.
180° solid carbide drills for machining aluminium available on request.
Not suitable for generating counterbores for socket-head screws to DIN974-1.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	> 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
122793				85	75	60		50						45			90	●	●	●	●	●	●

Ø D _c m7	12 2793	L ₂	L	Ø D _s	f	Ø D _c m7	12 2793	L ₂	L	Ø D _s	f	Ø D _c m7	12 2793	L ₂	L	Ø D _s	f
mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.
3	(eShop)	23.5	66	6	0.05	6,7	(eShop)	43	91	8	0.12	10,6	(eShop)	53.1	116	12	0.15
3,1	(eShop)	23.4	66	6	0.05	6,8	(eShop)	42.8	91	8	0.12	10,7	(eShop)	53	116	12	0.15
3,2	(eShop)	23.2	66	6	0.05	6,9	(eShop)	42.7	91	8	0.12	10,8	(eShop)	52.8	116	12	0.15
3,3	(eShop)	23.1	66	6	0.05	7	(eShop)	42.5	91	8	0.12	10,9	(eShop)	52.7	116	12	0.15
3,4	(eShop)	22.9	66	6	0.05	7,1	(eShop)	42.4	91	8	0.12	11	(eShop)	52.5	116	12	0.15
3,5	(eShop)	22.8	66	6	0.05	7,2	(eShop)	42.2	91	8	0.12	11,1	(eShop)	52.4	116	12	0.15
3,6	(eShop)	22.6	66	6	0.05	7,3	(eShop)	42.1	91	8	0.12	11,2	(eShop)	52.2	116	12	0.15
3,7	(eShop)	22.5	66	6	0.05	7,4	(eShop)	41.9	91	8	0.12	11,3	(eShop)	52.1	116	12	0.15
3,8	(eShop)	30.3	74	6	0.05	7,5	(eShop)	41.8	91	8	0.12	11,4	(eShop)	51.9	116	12	0.15
3,9	(eShop)	30.2	74	6	0.05	7,6	(eShop)	41.6	91	8	0.12	11,5	(eShop)	51.8	116	12	0.15
4	(eShop)	30	74	6	0.08	7,7	(eShop)	41.5	91	8	0.12	11,6	(eShop)	51.6	116	12	0.15
4,1	(eShop)	29.9	74	6	0.08	7,8	(eShop)	41.3	91	8	0.12	11,7	(eShop)	51.5	116	12	0.15
4,2	(eShop)	29.7	74	6	0.08	7,9	(eShop)	41.2	91	8	0.12	11,8	(eShop)	51.3	116	12	0.15
4,3	(eShop)	29.6	74	6	0.08	8	(eShop)	41	91	8	0.12	11,9	(eShop)	51.2	116	12	0.15
4,4	(eShop)	29.4	74	6	0.08	8,1	(eShop)	48.9	103	10	0.15	12	(eShop)	51	116	12	0.15
4,5	(eShop)	29.3	74	6	0.08	8,2	(eShop)	48.7	103	10	0.15	12,5	(eShop)	56.3	122	14	0.16
4,6	(eShop)	29.1	74	6	0.08	8,3	(eShop)	48.6	103	10	0.15	12,8	(eShop)	55.8	122	14	0.16
4,65	(eShop)	29	74	6	0.08	8,4	(eShop)	48.4	103	10	0.15	13	(eShop)	55.5	122	14	0.16
4,7	(eShop)	29	74	6	0.08	8,5	(eShop)	48.3	103	10	0.15	13,5	(eShop)	54.8	122	14	0.16
4,8	(eShop)	36.8	82	6	0.08	8,6	(eShop)	48.1	103	10	0.15	13,8	(eShop)	54.3	122	14	0.16
4,9	(eShop)	36.7	82	6	0.08	8,7	(eShop)	48	103	10	0.15	14	(eShop)	54	122	14	0.16
5	(eShop)	36.5	82	6	0.12	8,8	(eShop)	47.8	103	10	0.15	14,5	(eShop)	59.3	131	16	0.16
5,1	(eShop)	36.4	82	6	0.12	8,9	(eShop)	47.7	103	10	0.15	14,8	(eShop)	58.8	131	16	0.16
5,2	(eShop)	36.2	82	6	0.12	9	(eShop)	47.5	103	10	0.15	15	(eShop)	58.5	131	16	0.16
5,3	(eShop)	36.1	82	6	0.12	9,1	(eShop)	47.4	103	10	0.15	15,5	(eShop)	57.8	131	16	0.16
5,4	(eShop)	35.9	82	6	0.12	9,2	(eShop)	47.2	103	10	0.15	15,8	(eShop)	57.3	131	16	0.16
5,5	(eShop)	35.8	82	6	0.12	9,3	(eShop)	47.1	103	10	0.15	16	(eShop)	57	131	16	0.16
5,55	(eShop)	35.7	82	6	0.12	9,4	(eShop)	46.9	103	10	0.15	16,5	(eShop)	66.3	141	18	0.2
5,6	(eShop)	35.6	82	6	0.12	9,5	(eShop)	46.8	103	10	0.15	16,8	(eShop)	65.8	141	18	0.2
5,7	(eShop)	35.5	82	6	0.12	9,6	(eShop)	46.6	103	10	0.15	17	(eShop)	65.5	141	18	0.2
5,8	(eShop)	35.3	82	6	0.12	9,7	(eShop)	46.5	103	10	0.15	17,5	(eShop)	64.8	141	18	0.2
5,9	(eShop)	35.2	82	6	0.12	9,8	(eShop)	46.3	103	10	0.15	17,8	(eShop)	64.3	141	18	0.2
6	(eShop)	35	82	6	0.12	9,9	(eShop)	46.2	103	10	0.15	18	(eShop)	64	141	18	0.2
6,1	(eShop)	43.9	91	8	0.12	10	(eShop)	46	103	10	0.15	18,5	(eShop)	71.3	151	20	0.2
6,2	(eShop)	43.7	91	8	0.12	10,1	(eShop)	53.9	116	12	0.15	18,8	(eShop)	70.8	151	20	0.2
6,3	(eShop)	43.6	91	8	0.12	10,2	(eShop)	53.7	116	12	0.15	19	(eShop)	70.5	151	20	0.2
6,4	(eShop)	43.4	91	8	0.12	10,3	(eShop)	53.6	116	12	0.15	19,5	(eShop)	69.8	151	20	0.2
6,5	(eShop)	43.3	91	8	0.12	10,4	(eShop)	53.4	116	12	0.15	19,8	(eShop)	69.3	151	20	0.2
6,6	(eShop)	43.1	91	8	0.12	10,5	(eShop)	53.3	116	12	0.15	20	(eShop)	69	151	20	0.23



H7 ±0.003

Garant Solid carbide drill-reamer with pyramid tip

For producing tolerated holes in steel or short-chipping materials.

Reliable complete machining without separate centring and without subsequent reaming process. Significantly improved self-centring due to **additional pyramid tip** for optimum roundness and tolerance accuracy of the hole that is produced.

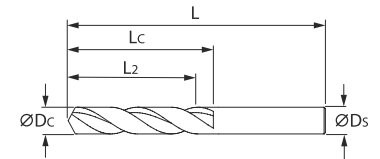
Two drill cutting edges and four reaming cutting edges for an attractive surface quality of the wall of the bore.

Tolerance specifications:

H7: Version for H7 bore tolerance.

+/- 0.003 mm: Manufacturing or cutting tolerance of nominal $\varnothing D_c$.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and HE shanks are available at the same price as HA.
For **HB shanks:** use order **No. 122797 + 129100HB**.
For **HE shanks:** use order **No. 122797 + 129100HE**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
12 2797				100	90	80	70	60									90						

$\varnothing D_c$	TIP	12 2797	Tolerance	L_2	L	$\varnothing D_s$	f
		Solid carbide drill-reamer with pyramid tip					
		DIN 6535 HA					
mm		TiAlN		mm	mm	mm	mm/rev.
4H7	eShop	H7		30	74	6	0.13
4,01	eShop	±0.003		30	74	6	0.13
4,02	eShop	±0.003		30	74	6	0.13
4,98	eShop	±0.003		45.5	91	6	0.13
5H7	eShop	H7		45.5	91	6	0.13
5,01	eShop	±0.003		45.5	91	6	0.13
5,02	eShop	±0.003		45.5	91	6	0.13
5,98	eShop	±0.003		44	91	6	0.15
5,99	eShop	±0.003		44	91	6	0.15
6	(eShop)	±0.003		44	91	6	0.15
6H7	eShop	H7		44	91	6	0.15
6,01	eShop	±0.003		44	91	6	0.15
6,02	eShop	±0.003		44	91	6	0.15
6,03	eShop	±0.003		44	91	6	0.15
7H7	eShop	H7		42.5	91	8	0.15
7,98	eShop	±0.003		41	91	8	0.17
7,99	eShop	±0.003		41	91	8	0.17
8	(eShop)	±0.003		41	91	8	0.17
8H7	eShop	H7		41	91	8	0.17

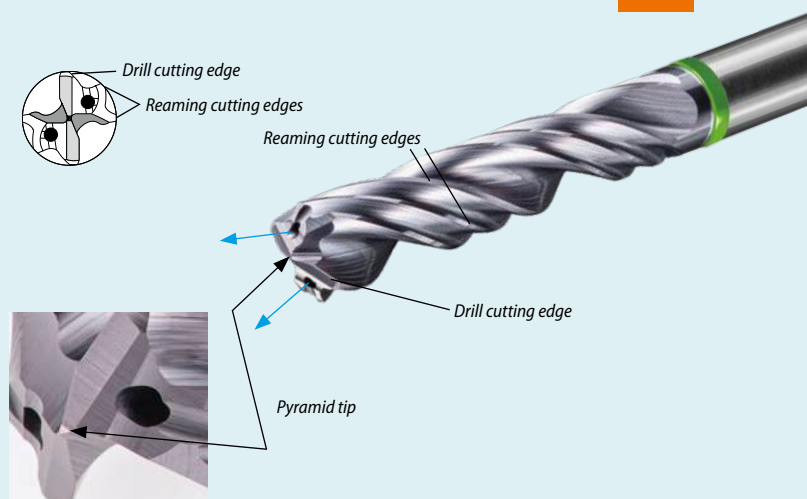
$\varnothing D_c$	TIP	12 2797	Tolerance	L_2	L	$\varnothing D_s$	f
		Solid carbide drill-reamer with pyramid tip					
		DIN 6535 HA					
mm		TiAlN		mm	mm	mm	mm/rev.
8,01	eShop	±0.003		41	91	8	0.17
8,02	eShop	±0.003		41	91	8	0.17
9H7	eShop	H7		47.5	103	10	0.17
9,54	(eShop)	±0.003		46.7	103	10	0.22
9,98	eShop	±0.003		46	103	10	0.22
9,99	eShop	±0.003		46	103	10	0.22
10	eShop	±0.003		46	103	10	0.22
10H7	eShop	H7		46	103	10	0.22
10,01	eShop	±0.003		46	103	10	0.22
10,02	eShop	±0.003		46	103	10	0.22
11,98	(eShop)	±0.003		53	118	12	0.24
11,99	eShop	±0.003		53	118	12	0.24
12	(eShop)	±0.003		53	118	12	0.24
12H7	eShop	H7		53	118	12	0.24
12,01	eShop	±0.003		53	118	12	0.24
12,02	(eShop)	±0.003		53	118	12	0.24
12,7	(eShop)	±0.003		58	124	14	0.27
14H7	eShop	H7		56	124	14	0.3
16H7	eShop	H7		59	133	16	0.3

Garant Centring, drilling and reaming in a single operation

With the new GARANT solid carbide drill reamer 12 2797 **several work steps** are combined and tolerated holes are produced faster and more efficiently.

The additional pyramid tip ensures optimum self-centring. Two cutting edges take over the pre-machining and four reaming cutting edges ensure the required surface quality, roundness and dimensional accuracy of the hole in reaming quality.

The elimination of a separate reaming process significantly reduces both direct production times and ancillary production times. In addition, the geometry of the cutting edges and guide chamfers permits precise and economical regrinding.

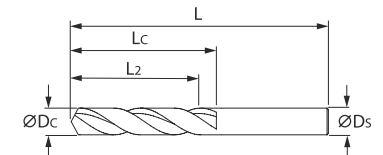
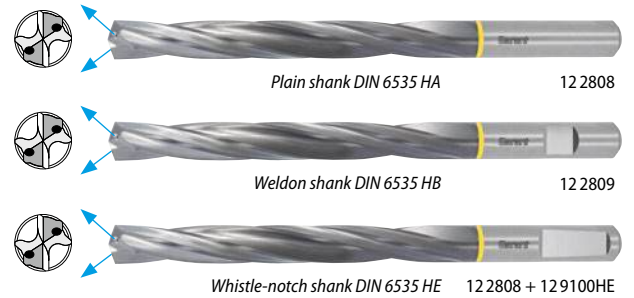




Garant Solid carbide HPC drill

DLC coating sp^2 of the latest generation with **low coefficient of friction** results in **outstanding chip clearance**. For **high-performance milling of aluminium materials**. **High roundness** and **alignment accuracy of the deep hole**, thanks to **6 guide chamfers**.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 122809**.
Form **HE**: order with **No. 122808 + 129100HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF	POM	PA 66	PEEK	PTFE	Cu	CuZn	GRP	CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
12 2808	325	360	315	135					80		70	60	70	140	160	70	70					

Ø D _c h7	12 2808	L ₂	L	Ø D _s	Alu f
	Solid carbide HPC drill, plain shank				
	DIN 6535 HA				
	DLC				
mm		mm	mm	mm	mm/rev.
2	eShop	22	66	4	0.2
2.1	eShop	21.9	66	4	0.22
2.2	eShop	21.7	66	4	0.22
2.3	eShop	21.6	66	4	0.22
2.4	eShop	26.4	66	4	0.22
2.5	eShop	26.3	66	4	0.22
2.6	eShop	26.1	66	4	0.22
2.7	eShop	26	66	4	0.22
2.8	eShop	25.8	66	4	0.22
2.9	eShop	25.7	66	4	0.22
3	eShop	29.5	72	6	0.22
3.1	eShop	29.4	72	6	0.35
3.2	eShop	29.2	72	6	0.35
3.3	eShop	29.1	72	6	0.35
3.4	eShop	28.9	72	6	0.35
3.5	eShop	28.8	72	6	0.35
3.6	eShop	28.6	72	6	0.35
3.7	eShop	28.5	72	6	0.35
3.8	eShop	37.3	81	6	0.35
3.9	eShop	37.2	81	6	0.35
4	eShop	37	81	6	0.35
4.1	eShop	36.9	81	6	0.35
4.2	eShop	36.7	81	6	0.35
4.3	eShop	36.6	81	6	0.35
4.4	eShop	36.4	81	6	0.35
4.5	eShop	36.3	81	6	0.35
4.6	eShop	36.1	81	6	0.35
4.7	eShop	36	81	6	0.35
4.8	eShop	49.8	95	6	0.35
4.9	eShop	49.7	95	6	0.35
5	eShop	49.5	95	6	0.35
5.1	eShop	49.4	95	6	0.45
5.2	eShop	49.2	95	6	0.45
5.3	eShop	49.1	95	6	0.45
5.4	eShop	48.9	95	6	0.45
5.5	eShop	48.8	95	6	0.45
5.6	eShop	48.6	95	6	0.45
5.7	eShop	48.5	95	6	0.45
5.8	eShop	48.3	95	6	0.45
5.9	eShop	48.2	95	6	0.45
6	eShop	48	95	6	0.45
6.1	eShop	66.9	114	8	0.45
6.2	eShop	66.7	114	8	0.45
6.3	eShop	66.6	114	8	0.45
6.4	eShop	66.4	114	8	0.45
6.5	eShop	66.3	114	8	0.45
6.6	eShop	66.1	114	8	0.45
6.7	eShop	66	114	8	0.45
6.8	eShop	65.8	114	8	0.45
6.9	eShop	65.7	114	8	0.45
7	eShop	65.5	114	8	0.45
7.1	eShop	65.4	114	8	0.45
7.2	eShop	65.2	114	8	0.45
7.3	eShop	65.1	114	8	0.45
7.4	eShop	64.9	114	8	0.45
7.5	eShop	64.8	114	8	0.45

Ø D _c h7	12 2808	L ₂	L	Ø D _s	Alu f
	Solid carbide HPC drill, plain shank				
	DIN 6535 HA				
	DLC				
mm		mm	mm	mm	mm/rev.
7.6	eShop	64.6	114	8	0.45
7.7	eShop	64.5	114	8	0.45
7.8	eShop	64.3	114	8	0.45
7.9	eShop	64.2	114	8	0.45
8	eShop	64	114	8	0.45
8.1	eShop	82.9	142	10	0.55
8.2	eShop	82.7	142	10	0.55
8.3	eShop	82.6	142	10	0.55
8.4	eShop	82.4	142	10	0.55
8.5	eShop	82.3	142	10	0.55
8.6	eShop	82.1	142	10	0.55
8.7	eShop	82	142	10	0.55
8.8	eShop	81.8	142	10	0.55
8.9	eShop	81.7	142	10	0.55
9	eShop	81.5	142	10	0.55
9.1	eShop	81.4	142	10	0.55
9.2	eShop	81.2	142	10	0.55
9.3	eShop	81.1	142	10	0.55
9.4	eShop	80.9	142	10	0.55
9.5	eShop	80.8	142	10	0.55
9.6	eShop	80.6	142	10	0.55
9.7	eShop	80.5	142	10	0.55
9.8	eShop	80.3	142	10	0.55
9.9	eShop	80.2	142	10	0.55
10	eShop	80	142	10	0.55
10.2	eShop	98.7	162	12	0.55
10.5	eShop	98.3	162	12	0.55
10.8	eShop	97.8	162	12	0.55
11	eShop	97.5	162	12	0.55
11.5	eShop	96.8	162	12	0.55
11.8	eShop	96.3	162	12	0.55
12	eShop	96	162	12	0.55
12.5	eShop	112.3	178	14	0.65
12.8	eShop	111.8	178	14	0.65
13	eShop	111.5	178	14	0.65
13.5	eShop	110.8	178	14	0.65
13.8	eShop	110.3	178	14	0.65
14	eShop	110	178	14	0.65
14.5	eShop	130.3	203	16	0.65
14.8	eShop	129.8	203	16	0.65
15	eShop	129.5	203	16	0.65
15.5	eShop	128.8	203	16	0.65
15.8	eShop	128.3	203	16	0.65
16	eShop	128	203	16	0.65
16.5	eShop	146.3	222	18	0.7
16.8	eShop	145.8	222	18	0.7
17	eShop	145.5	222	18	0.7
17.5	eShop	144.8	222	18	0.7
17.8	eShop	144.3	222	18	0.7
18	eShop	144	222	18	0.7
18.5	eShop	162.3	243	20	0.7
18.8	eShop	161.8	243	20	0.7
19	eShop	161.5	243	20	0.7
19.5	eShop	160.8	243	20	0.7
19.8	eShop	160.3	243	20	0.7
20	eShop	160	243	20	0.7



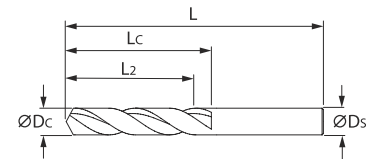
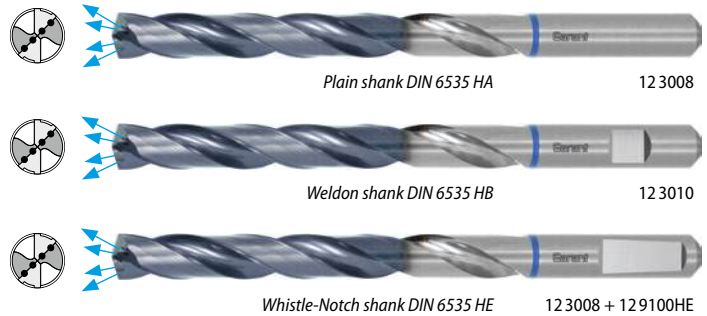
Garant Solid carbide HPC drill with 4 cooling channels

Cutting chisel edge with **high centring accuracy** due to **strong core and special point geometry**.

High roundness and alignment accuracy of the deep hole, thanks to **4 guide chamfers**. Outstanding chip evacuation due to **4 internal cooling channels** from Ø 3.8 mm. Up to 3.7 mm Ø with 2 internal cooling channels.

Straight major cutting edges with honed edges and special flute profile for **short chips**, even on long chipping materials.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 123010**.
Form **HE**: order with **No. 123008 + 129100HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
12 3008				90	75	70	55	32						70	60								

Ø D _c m6	12 3008	L ₂	L	Ø D _s	INOX > 900 N f
(mm or inch)	Solid carbide HPC drill plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.
3	eShop	29.5	72	6	0.06
3,3	eShop	29.1	72	6	0.06
3,4	eShop	28.9	72	6	0.06
3,5	eShop	28.8	72	6	0.06
3,7	eShop	28.5	72	6	0.06
3,8	eShop	37.3	81	6	0.06
4	eShop	37	81	6	0.08
4,1	eShop	36.9	81	6	0.08
4,2	eShop	36.7	81	6	0.08
4,3	eShop	36.6	81	6	0.08
4,5	eShop	36.3	81	6	0.08
4,6	eShop	36.1	81	6	0.08
3/16	eShop	49.8	95	6	0.08
4,8	eShop	49.8	95	6	0.08
4,9	eShop	49.7	95	6	0.08
5	eShop	49.5	95	6	0.08
5,1	eShop	49.4	95	6	0.12
5,2	eShop	49.2	95	6	0.12
5,3	eShop	49.1	95	6	0.12
5,5	eShop	48.8	95	6	0.12
7/32	eShop	48.3	95	6	0.12
5,8	eShop	48.3	95	6	0.12
5,9	eShop	48.2	95	6	0.12
6	eShop	48	95	6	0.12
6,1	eShop	66.9	114	8	0.12
6,2	eShop	66.7	114	8	0.12
6,3	eShop	66.6	114	8	0.12
1/4	eShop	66.3	114	8	0.12
6,35	eShop	66.5	114	8	0.12
6,5	eShop	66.3	114	8	0.12
6,6	eShop	66.1	114	8	0.12
6,7	eShop	66	114	8	0.12
6,8	eShop	65.8	114	8	0.12
7	eShop	65.5	114	8	0.12
9/32	eShop	64.9	114	8	0.12
7,4	eShop	64.9	114	8	0.12
7,5	eShop	64.8	114	8	0.12
7,7	eShop	64.5	114	8	0.12
7,8	eShop	64.3	114	8	0.12
7,9	eShop	64.2	114	8	0.12
5/16	eShop	64	114	8	0.12
8	eShop	64	114	8	0.12
8,1	eShop	82.9	142	10	0.15
8,2	eShop	82.7	142	10	0.15
8,3	eShop	82.6	142	10	0.15
8,5	eShop	82.3	142	10	0.15
8,6	eShop	82.1	142	10	0.15
8,7	eShop	82	142	10	0.15

Ø D _c m6	12 3008	L ₂	L	Ø D _s	INOX > 900 N f
(mm or inch)	Solid carbide HPC drill plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.
11/32	eShop	82	142	10	0.15
8,8	eShop	81.8	142	10	0.15
9	eShop	81.5	142	10	0.15
9,1	(eShop)	81.4	142	10	0.15
9,2	eShop	81.2	142	10	0.15
9,3	eShop	81.1	142	10	0.15
9,4	(eShop)	80.9	142	10	0.15
9,5	eShop	80.8	142	10	0.15
3/8	eShop	80.5	142	10	0.15
9,7	eShop	80.5	142	10	0.15
9,8	eShop	80.3	142	10	0.15
9,9	(eShop)	80.2	142	10	0.15
10	eShop	80	142	10	0.15
10,2	eShop	98.7	162	12	0.15
13/32	eShop	98.3	162	12	0.15
10,5	eShop	98.3	162	12	0.15
11	eShop	97.5	162	12	0.15
7/16	eShop	97.2	162	12	0.15
11,2	eShop	97.2	162	12	0.15
11,5	eShop	96.8	162	12	0.15
11,8	eShop	96.3	162	12	0.15
12	eShop	96	162	12	0.15
12,2	eShop	112.7	178	14	0.2
12,5	eShop	112.3	178	14	0.2
1/2	eShop	112.3	178	14	0.2
12,7	eShop	112	178	14	0.2
13	eShop	111.5	178	14	0.2
13,5	eShop	110.8	178	14	0.2
13,8	eShop	110.3	178	14	0.2
14	eShop	110	178	14	0.2
14,2	eShop	130.7	203	16	0.2
9/16	eShop	130.7	203	16	0.2
14,5	eShop	130.3	203	16	0.2
14,8	eShop	129.8	203	16	0.2
15	eShop	129.5	203	16	0.2
15,5	eShop	128.8	203	16	0.2
15,6	eShop	128.8	203	16	0.2
15,8	eShop	128.3	203	16	0.2
5/8	eShop	128.3	203	16	0.2
16	eShop	128	203	16	0.2
16,5	eShop	146.3	222	18	0.25
17	eShop	145.5	222	18	0.25
17,5	eShop	144.8	222	18	0.25
18	eShop	144	222	18	0.25
18,5	eShop	162.3	243	20	0.25
19	eShop	161.5	243	20	0.25
20	eShop	160	243	20	0.25



GARANT Uni Hero solid carbide high-performance drill

The ultimate in universality and profitability in one tool.

Robust tool design and **convex-concave curved cutting edge design** for optimum tool stability and chip breakage behaviour in a wide range of materials. **Special flute geometry** and **polished flutes** for ideal chip evacuation and maximum process reliability.

Ultra-smooth TiAlSiN high-performance coating to effectively reduce wear and the formation of built-up edges.

Note:

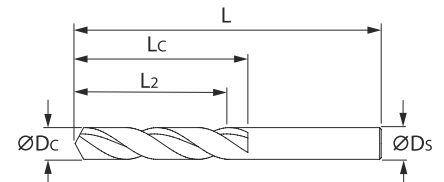
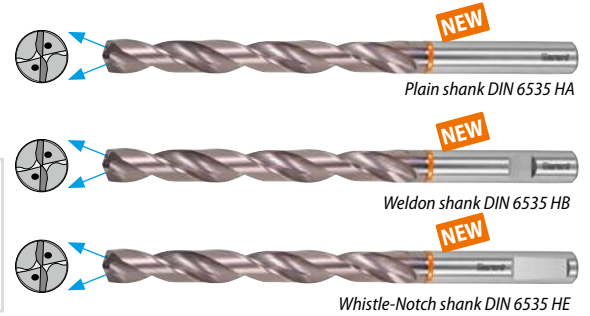
Flute length $L_c = L_2 + 1.5 \times D_c$.

HB and HE shanks are available at the same price as HA.

For **HB shanks**: use order no. **123021**.

HE shank: order with No. **123020** and **129100HE**.

Items with prices in brackets: Differing delivery time and minimum order quantity 3 pieces.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	95					
12 3020	140	150		120	115	110	80	70						65	60	35	95						

Ø D _c h7	12 3020	L ₂	L	Ø D _s	f	Ø D _c h7	12 3020	L ₂	L	Ø D _s	f
	GARANT Uni Hero solid carbide drill plain shank DIN 6535 HA						GARANT Uni Hero solid carbide drill plain shank DIN 6535 HA				
mm	TiAlSiN	mm	mm	mm	mm/rev.	mm	TiAlSiN	mm	mm	mm	mm/rev.
3	eShop	29.5	72	6	0.08	7,8	eShop	64.3	114	8	0.17
3,1	eShop	29.4	72	6	0.08	7,9	(eShop)	64.2	114	8	0.17
3,2	eShop	29.2	72	6	0.08	8	eShop	64	114	8	0.17
3,3	eShop	29.1	72	6	0.08	8,1	eShop	82.9	142	10	0.17
3,4	eShop	28.9	72	6	0.09	8,2	eShop	82.7	142	10	0.17
3,5	eShop	28.8	72	6	0.09	8,3	eShop	82.6	142	10	0.17
3,6	(eShop)	28.6	72	6	0.09	8,4	eShop	82.4	142	10	0.18
3,7	eShop	28.5	72	6	0.09	8,5	eShop	82.3	142	10	0.18
3,8	eShop	37.3	81	6	0.1	8,6	eShop	82.1	142	10	0.18
3,9	eShop	37.2	81	6	0.1	8,7	eShop	82	142	10	0.18
4	eShop	37	81	6	0.1	8,8	eShop	81.8	142	10	0.18
4,1	eShop	36.9	81	6	0.1	9	eShop	81.5	142	10	0.18
4,2	eShop	36.7	81	6	0.1	9,1	eShop	81.4	142	10	0.19
4,3	eShop	36.6	81	6	0.11	9,2	eShop	81.2	142	10	0.19
4,4	(eShop)	36.4	81	6	0.11	9,3	eShop	81.1	142	10	0.19
4,5	eShop	36.3	81	6	0.11	9,4	eShop	80.9	142	10	0.19
4,6	eShop	36.1	81	6	0.11	9,5	eShop	80.8	142	10	0.19
4,7	eShop	36	81	6	0.11	9,6	eShop	80.6	142	10	0.19
4,8	eShop	49.8	95	6	0.12	9,7	(eShop)	80.5	142	10	0.19
4,9	eShop	49.7	95	6	0.12	9,8	eShop	80.3	142	10	0.2
5	eShop	49.5	95	6	0.12	9,9	eShop	80.2	142	10	0.2
5,1	eShop	49.4	95	6	0.12	10	eShop	80	142	10	0.2
5,2	eShop	49.2	95	6	0.12	10,2	eShop	98.7	162	12	0.2
5,3	(eShop)	49.1	95	6	0.12	10,3	eShop	98.6	162	12	0.2
5,4	eShop	48.9	95	6	0.13	10,5	eShop	98.3	162	12	0.2
5,5	eShop	48.8	95	6	0.13	10,8	eShop	97.8	162	12	0.21
5,6	eShop	48.6	95	6	0.13	11	eShop	97.5	162	12	0.21
5,7	(eShop)	48.5	95	6	0.13	11,2	eShop	97.2	162	12	0.21
5,8	eShop	48.3	95	6	0.13	11,5	eShop	96.8	162	12	0.21
5,9	eShop	48.2	95	6	0.14	11,8	eShop	96.3	162	12	0.22
6	eShop	48	95	6	0.14	12	eShop	96	162	12	0.22
6,1	eShop	66.9	114	8	0.14	12,2	eShop	114.7	178	14	0.22
6,2	eShop	66.7	114	8	0.14	12,5	eShop	114.3	178	14	0.22
6,3	eShop	66.6	114	8	0.14	12,8	(eShop)	113.8	178	14	0.22
6,4	eShop	66.4	114	8	0.14	13	eShop	113.5	178	14	0.23
6,5	eShop	66.3	114	8	0.15	13,2	(eShop)	113.2	178	14	0.23
6,6	eShop	66.1	114	8	0.15	13,5	eShop	112.8	178	14	0.23
6,7	(eShop)	66	114	8	0.15	13,8	(eShop)	112.3	178	14	0.23
6,8	eShop	65.8	114	8	0.15	14	eShop	112	178	14	0.23
6,9	eShop	65.7	114	8	0.15	14,2	(eShop)	130.7	203	16	0.23
7	eShop	65.5	114	8	0.15	14,5	eShop	130.3	203	16	0.24
7,1	eShop	65.4	114	8	0.16	14,8	(eShop)	129.8	203	16	0.24
7,2	(eShop)	65.2	114	8	0.16	15	eShop	129.5	203	16	0.24
7,3	(eShop)	65.1	114	8	0.16	15,2	(eShop)	129.2	203	16	0.24
7,4	eShop	64.9	114	8	0.16	15,3	(eShop)	129.1	203	16	0.24
7,5	eShop	64.8	114	8	0.16	15,5	(eShop)	128.8	203	16	0.24
7,6	(eShop)	64.6	114	8	0.16	15,8	eShop	128.3	203	16	0.24
7,7	(eShop)	64.5	114	8	0.17	16	eShop	128	203	16	0.24



GARANT Master Steel Speed solid carbide drill

Developed for use with **very high cutting speeds**.

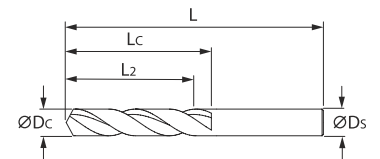
Outstandingly suitable for machines with **low installed power** and high speeds.

- Clear reduction in cutting forces due to special cutter geometry.
- Coating for best wear resistance even at high process temperatures.
- Polished flutes for good chip clearance.

A **slim chisel point** and the **special arrangement of the 4 guide chamfers** ensure **high positioning and alignment accuracy**.

Optimised micro-geometry for increased working life and performance capability.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Versions HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 123026**.
Form **HE**: order with **No. 123025 + 129100HE**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
12 3025				195	150	135	125	80						65		120	115						

$\varnothing D_c$ h7	12 3025	L_2	L	$\varnothing D_s$	f	$\varnothing D_c$ h7	12 3025	L_2	L	$\varnothing D_s$	f	$\varnothing D_c$ h7	12 3025	L_2	L	$\varnothing D_s$	f
	GARANT Master Steel Speed solid carbide drill, plain shank DIN 6535 HA						GARANT Master Steel Speed solid carbide drill, plain shank DIN 6535 HA						GARANT Master Steel Speed solid carbide drill, plain shank DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.
3	eShop	29.5	72	6	0.09	7,1	eShop	65.4	114	8	0.15	11,2	eShop	97.2	162	12	0.2
3,1	eShop	29.4	72	6	0.09	7,2	eShop	65.2	114	8	0.15	11,3	eShop	97.1	162	12	0.2
3,2	eShop	29.2	72	6	0.09	7,3	eShop	65.1	114	8	0.15	11,4	eShop	96.9	162	12	0.2
3,3	eShop	29.1	72	6	0.09	7,4	eShop	64.9	114	8	0.15	11,5	eShop	96.8	162	12	0.2
3,4	eShop	28.9	72	6	0.09	7,5	eShop	64.8	114	8	0.15	11,6	eShop	96.6	162	12	0.2
3,5	eShop	28.8	72	6	0.09	7,6	eShop	64.6	114	8	0.15	11,7	eShop	96.5	162	12	0.2
3,6	eShop	28.6	72	6	0.09	7,7	eShop	64.5	114	8	0.15	11,8	eShop	96.3	162	12	0.2
3,7	eShop	28.5	72	6	0.09	7,8	eShop	64.3	114	8	0.15	11,9	eShop	96.2	162	12	0.2
3,8	eShop	37.3	81	6	0.09	7,9	eShop	64.2	114	8	0.15	12	eShop	96	162	12	0.2
3,9	eShop	37.2	81	6	0.09	8	eShop	64	114	8	0.15	12,2	eShop	114.7	178	14	0.23
4	eShop	37	81	6	0.09	8,1	eShop	82.9	142	10	0.18	12,5	eShop	114.3	178	14	0.23
4,1	eShop	36.9	81	6	0.1	8,2	eShop	82.7	142	10	0.18	12,8	eShop	113.8	178	14	0.23
4,2	eShop	36.7	81	6	0.1	8,3	eShop	82.6	142	10	0.18	13	eShop	113.5	178	14	0.23
4,3	eShop	36.6	81	6	0.1	8,4	eShop	82.4	142	10	0.18	13,2	eShop	113.2	178	14	0.23
4,4	eShop	36.4	81	6	0.1	8,5	eShop	82.3	142	10	0.18	13,5	eShop	112.8	178	14	0.23
4,5	eShop	36.3	81	6	0.1	8,6	eShop	82.1	142	10	0.18	13,8	eShop	112.3	178	14	0.23
4,6	eShop	36.1	81	6	0.1	8,7	eShop	82	142	10	0.18	14	eShop	112	178	14	0.23
4,7	eShop	36	81	6	0.1	8,8	eShop	81.8	142	10	0.18	14,2	eShop	110.7	203	16	0.26
4,8	eShop	49.8	95	6	0.1	8,9	eShop	81.7	142	10	0.18	14,5	eShop	130.3	203	16	0.26
4,9	eShop	49.7	95	6	0.1	9	eShop	81.5	142	10	0.18	14,8	eShop	129.8	203	16	0.26
5	eShop	49.5	95	6	0.1	9,1	eShop	81.4	142	10	0.18	15	eShop	129.5	203	16	0.26
5,1	eShop	49.4	95	6	0.125	9,2	eShop	81.2	142	10	0.18	15,2	eShop	129.2	203	16	0.26
5,2	eShop	49.2	95	6	0.125	9,3	eShop	81.1	142	10	0.18	15,5	eShop	128.8	203	16	0.26
5,3	eShop	49.1	95	6	0.125	9,4	eShop	80.9	142	10	0.18	15,8	eShop	128.3	203	16	0.26
5,4	eShop	48.9	95	6	0.125	9,5	eShop	80.8	142	10	0.18	16	eShop	128	203	16	0.26
5,5	eShop	48.8	95	6	0.125	9,6	eShop	80.6	142	10	0.18	16,2	eShop	146.7	222	18	0.29
5,6	eShop	48.6	95	6	0.125	9,7	eShop	80.5	142	10	0.18	16,5	eShop	146.3	222	18	0.29
5,7	eShop	48.5	95	6	0.125	9,8	eShop	80.3	142	10	0.18	16,8	eShop	145.8	222	18	0.29
5,8	eShop	48.3	95	6	0.125	9,9	eShop	80.2	142	10	0.18	17	eShop	145.5	222	18	0.29
5,9	eShop	48.2	95	6	0.125	10	eShop	80	142	10	0.18	17,2	eShop	145.2	222	18	0.29
6	eShop	48	95	6	0.125	10,1	eShop	98.9	162	12	0.2	17,5	eShop	144.8	222	18	0.29
6,1	eShop	66.9	114	8	0.15	10,2	eShop	98.7	162	12	0.2	17,8	eShop	144.3	222	18	0.29
6,2	eShop	66.7	114	8	0.15	10,3	eShop	98.6	162	12	0.2	18	eShop	144	222	18	0.29
6,3	eShop	66.6	114	8	0.15	10,4	eShop	98.4	162	12	0.2	18,2	eShop	162.7	243	20	0.325
6,4	eShop	66.4	114	8	0.15	10,5	eShop	98.3	162	12	0.2	18,5	eShop	162.3	243	20	0.325
6,5	eShop	66.3	114	8	0.15	10,6	eShop	98.1	162	12	0.2	18,8	eShop	161.8	243	20	0.325
6,6	eShop	66.1	114	8	0.15	10,7	eShop	98	162	12	0.2	19	eShop	161.5	243	20	0.325
6,7	eShop	66	114	8	0.15	10,8	eShop	97.8	162	12	0.2	19,2	eShop	161.2	243	20	0.325
6,8	eShop	65.8	114	8	0.15	10,9	eShop	97.7	162	12	0.2	19,5	eShop	160.8	243	20	0.325
6,9	eShop	65.7	114	8	0.15	11	eShop	97.5	162	12	0.2	19,8	eShop	160.3	243	20	0.325
7	eShop	65.5	114	8	0.15	11,1	eShop	97.4	162	12	0.2	20	eShop	160	243	20	0.325



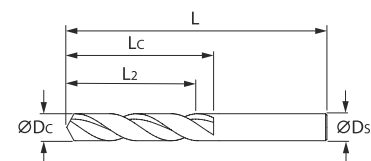
GARANT Master Steel Feed solid carbide drill

3-flute drill, specially developed for **use at very high feed rates**.
Outstandingly suitable for **machines with high installed power** and stable operating conditions.

- Special cutter geometry with stable cutting edges and large clearance at the centre enables very high feed rates.
- The patented tip is optimised for chip flow and generates low cutting pressure with good chip breakage.

The **sector-leading technology of the drill point** guarantees **optimum self-centring behaviour**. 3 guide chamfers guarantee a stable exit from the hole and an exact roundness of the hole.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 123036**.
Form **HE**: order with **No. 123035 + 129100HE**.



Suitable for/ v_c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	K						
12 3035				120	110	100	90	70	60				55	50	40	120	80	●		●	●		

Ø D _c h7	TIE	12 3035	L ₂	L	Ø D _s	f	Ø D _c h7	TIE	12 3035	L ₂	L	Ø D _s	f	Ø D _c h7	TIE	12 3035	L ₂	L	Ø D _s	f
(mm or inch)		GARANT Master Steel Feed solid carbide drill, plain shank					(mm or inch)		GARANT Master Steel Feed solid carbide drill, plain shank					(mm or inch)		GARANT Master Steel Feed solid carbide drill, plain shank				
		DIN 6535 HA							DIN 6535 HA							DIN 6535 HA				
		TiAlN	mm	mm	mm	mm/rev.			TiAlN	mm	mm	mm	mm/rev.			TiAlN	mm	mm	mm	mm/rev.
4	eShop	37	81	6	0.28		7,6	eShop	64.6	114	8	0.37		11,5	eShop	96.8	162	12	0.5	
4,1	eShop	36.9	81	6	0.28		7,7	eShop	64.5	114	8	0.37		11,6	eShop	96.6	162	12	0.5	
4,2	eShop	36.7	81	6	0.28		7,8	eShop	64.3	114	8	0.37		11,7	eShop	96.5	162	12	0.5	
4,3	eShop	36.6	81	6	0.28		7,9	eShop	64.2	114	8	0.37		11,8	eShop	96.3	162	12	0.5	
4,4	eShop	36.4	81	6	0.28		8	eShop	64	114	8	0.37		11,9	eShop	96.2	162	12	0.5	
4,5	eShop	36.3	81	6	0.28		8,1	eShop	82.9	142	10	0.44		12	eShop	96	162	12	0.5	
4,6	eShop	36.1	81	6	0.28		8,2	eShop	82.7	142	10	0.44		12,2	eShop	114.7	178	14	0.56	
4,7	eShop	36	81	6	0.28		8,3	eShop	82.6	142	10	0.44		12,5	eShop	114.3	178	14	0.56	
3/16	eShop	49.8	95	6	0.28		8,4	eShop	82.4	142	10	0.44		12,8	eShop	113.8	178	14	0.56	
4,8	eShop	49.8	95	6	0.28		8,5	eShop	82.3	142	10	0.44		13	eShop	113.5	178	14	0.56	
4,9	eShop	49.7	95	6	0.28		8,6	eShop	82.1	142	10	0.44		13,2	eShop	113.2	178	14	0.56	
5	eShop	49.5	95	6	0.28		8,7	eShop	82	142	10	0.44		13,5	eShop	112.8	178	14	0.56	
5,1	eShop	49.4	95	6	0.32		8,8	eShop	81.8	142	10	0.44		13,8	eShop	112.3	178	14	0.56	
5,2	eShop	49.2	95	6	0.32		8,9	eShop	81.7	142	10	0.44		14	eShop	112	178	14	0.56	
5,3	eShop	49.1	95	6	0.32		9	eShop	81.5	142	10	0.44		14,2	eShop	130.7	203	16	0.61	
5,4	eShop	48.9	95	6	0.32		9,1	eShop	81.4	142	10	0.44		14,5	eShop	130.3	203	16	0.61	
5,5	eShop	48.8	95	6	0.32		9,2	eShop	81.2	142	10	0.44		14,8	eShop	129.8	203	16	0.61	
7/32	eShop	48.6	95	6	0.32		9,3	eShop	81.1	142	10	0.44		15	eShop	129.5	203	16	0.61	
5,6	eShop	48.6	95	6	0.32		9,4	eShop	80.9	142	10	0.44		15,2	eShop	129.2	203	16	0.61	
5,7	eShop	48.5	95	6	0.32		9,5	eShop	80.8	142	10	0.44		15,5	eShop	128.8	203	16	0.61	
5,8	eShop	48.3	95	6	0.32		9,6	eShop	80.6	142	10	0.44		15,8	eShop	128.3	203	16	0.61	
5,9	eShop	48.2	95	6	0.32		9,7	eShop	80.5	142	10	0.44		16	eShop	128	203	16	0.61	
6	eShop	48	95	6	0.32		9,8	eShop	80.3	142	10	0.44		16,2	eShop	146.7	222	18	0.66	
6,1	eShop	66.9	114	8	0.37		9,9	eShop	80.2	142	10	0.44		16,5	eShop	146.3	222	18	0.66	
6,2	eShop	66.7	114	8	0.37		10	eShop	80	142	10	0.44		16,8	eShop	145.8	222	18	0.66	
6,3	eShop	66.6	114	8	0.37		10,1	eShop	98.9	162	12	0.5		17	eShop	145.5	222	18	0.66	
6,35	eShop	66.5	114	8	0.37		10,2	eShop	98.7	162	12	0.5		17,2	eShop	145.2	222	18	0.66	
6,4	eShop	66.4	114	8	0.37		10,3	eShop	98.6	162	12	0.5		17,5	eShop	144.8	222	18	0.66	
6,5	eShop	66.3	114	8	0.37		10,4	eShop	98.4	162	12	0.5		17,8	eShop	144.3	222	18	0.66	
6,6	eShop	66.1	114	8	0.37		10,5	eShop	98.3	162	12	0.5		18	eShop	144	222	18	0.66	
6,7	eShop	66	114	8	0.37		10,6	eShop	98.1	162	12	0.5		18,2	eShop	162.7	243	20	0.69	
6,8	eShop	65.8	114	8	0.37		10,7	eShop	98	162	12	0.5		18,5	eShop	162.3	243	20	0.69	
6,9	eShop	65.7	114	8	0.37		10,8	eShop	97.8	162	12	0.5		18,8	eShop	161.8	243	20	0.69	
7	eShop	65.5	114	8	0.37		10,9	eShop	97.7	162	12	0.5		19	eShop	161.5	243	20	0.69	
7,1	eShop	65.4	114	8	0.37		11	eShop	97.5	162	12	0.5		19,2	eShop	161.2	243	20	0.69	
7,2	eShop	65.2	114	8	0.37		11,1	eShop	97.4	162	12	0.5		19,5	eShop	160.8	243	20	0.69	
7,3	eShop	65.1	114	8	0.37		11,2	eShop	97.2	162	12	0.5		19,8	eShop	160.3	243	20	0.69	
7,4	eShop	64.9	114	8	0.37		11,3	eShop	97.1	162	12	0.5		20	eShop	160	243	20	0.69	
7,5	eShop	64.8	114	8	0.37		11,4	eShop	96.9	162	12	0.5								



Garant Solid carbide HPC drill, plain shank

Robust drill design and optimised special point geometry for the best possible chip formation and reliable chip breakage with higher feed rates at the same time. Advanced micro-geometry, convex cutting edge and conical profile grinding to provide additional stability for the main cutting edge.

Optimised flute geometry and patented face geometry for reliable chip evacuation in steel materials and cast material.

High-performance coating of the latest generation.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
HB and **HE** shanks are available at the same price as HA.
 For **HB shanks**: use order no. **123041**.
 For **HE shank**: use order no. **123040 + 129100 HE**.



Plain shank DIN 6535 HA

12 3040

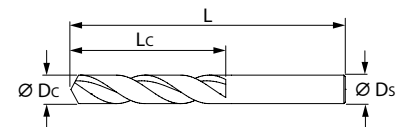


Weldon shank DIN 6535 HB

12 3041



Whistle-Notch shank DIN 6535 HE 12 3040+ 129100HE



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
12 3040				130	120	110	100	80									95						

Ø D _c h7	12 3040	Tolerance nominal Ø	L ₂	L	Ø D _s	f
	GARANT Master Steel solid carbide high-performance drill, plain shank					
	DIN 6535 HA					
mm	TIAlN		mm	mm	mm	mm/rev.
3	eShop	h7	29.5	72	6	0.11
3,3	eShop	h7	29.1	72	6	0.12
3,4	eShop	h7	28.9	72	6	0.12
3,5	eShop	h7	28.8	72	6	0.13
3,7	eShop	h7	28.5	72	6	0.13
3,8	eShop	h7	37.3	81	6	0.13
4	eShop	h7	37	81	6	0.14
4,1	eShop	h7	36.9	81	6	0.14
4,2	eShop	h7	36.7	81	6	0.14
4,3	eShop	h7	36.6	81	6	0.14
4,5	eShop	h7	36.3	81	6	0.15
4,6	eShop	h7	36.1	81	6	0.15
4,8	eShop	h7	49.8	95	6	0.16
5	eShop	h7	49.5	95	6	0.16
5,1	eShop	h7	49.4	95	6	0.16
5,2	eShop	h7	49.2	95	6	0.16
5,3	eShop	h7	49.1	95	6	0.17
5,5	eShop	h7	48.8	95	6	0.17
5,8	eShop	h7	48.3	95	6	0.18
6	eShop	h7	48	95	6	0.18
6,1	eShop	h7	66.9	114	8	0.18
6,5	eShop	h7	66.3	114	8	0.19
6,6	eShop	h7	66.1	114	8	0.19
6,8	eShop	h7	65.8	114	8	0.2
7	eShop	h7	65.5	114	8	0.2
7,5	eShop	h7	64.8	114	8	0.21
7,7	eShop	h7	64.5	114	8	0.22
7,8	eShop	h7	64.3	114	8	0.22
8	eShop	h7	64	114	8	0.22
8,1	eShop	h7	82.9	142	10	0.22
8,3	eShop	h7	82.6	142	10	0.23

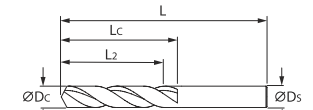
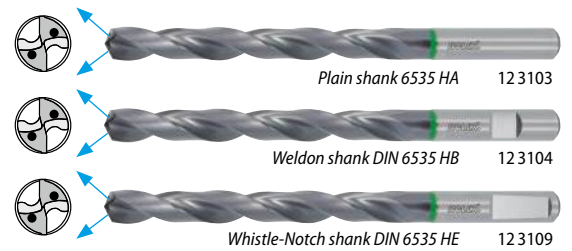
Ø D _c h7	12 3040	Tolerance nominal Ø	L ₂	L	Ø D _s	f
	GARANT Master Steel solid carbide high-performance drill, plain shank					
	DIN 6535 HA					
mm	TIAlN		mm	mm	mm	mm/rev.
8,5	eShop	h7	82.3	142	10	0.23
8,6	eShop	h7	82.1	142	10	0.23
8,8	eShop	h7	81.8	142	10	0.24
9	eShop	h7	81.5	142	10	0.24
9,3	eShop	h7	81.1	142	10	0.25
9,5	eShop	h7	80.8	142	10	0.25
9,7	eShop	h7	80.5	142	10	0.25
9,8	eShop	h7	80.3	142	10	0.26
10	eShop	h7	80	142	10	0.26
10,2	eShop	h7	98.7	162	12	0.26
10,5	eShop	h7	98.3	162	12	0.27
11	eShop	h7	97.5	162	12	0.28
11,2	eShop	h7	97.2	162	12	0.28
11,5	eShop	h7	96.8	162	12	0.29
11,8	eShop	h7	96.3	162	12	0.29
12	eShop	h7	96	162	12	0.29
12,2	eShop	h7	112.7	178	14	0.3
12,5	eShop	h7	112.3	178	14	0.3
12,8	eShop	h7	111.8	178	14	0.31
13	eShop	h7	111.5	178	14	0.31
13,5	eShop	h7	110.8	178	14	0.32
14	eShop	h7	110	178	14	0.33
14,5	eShop	h7	130.3	203	16	0.33
14,8	eShop	h7	129.8	203	16	0.34
15	eShop	h7	129.5	203	16	0.34
15,5	eShop	h7	128.8	203	16	0.35
16	eShop	h7	128	203	16	0.35
17,5	eShop	h7	144.8	222	18	0.37
18	eShop	h7	144	222	18	0.38
19	eShop	h7	161.5	243	20	0.39
20	eShop	h7	160	243	20	0.4



HOLEX Pro Steel solid carbide high-performance drill

Straight major cutting edges and a special flute profile ensure good chip evacuation. The robust cutter geometry ensures high-performance drilling with good process reliability. A wide range of applications in steel materials thanks to a combination of tough ultra-fine grain carbide and extremely wear-resistant coating.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Versions with HB and HE shank available at the same price as HA.
For **HB shanks**: use order **No. 123104**.
For **HE shanks**: use order **no. 123109**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG < 900 N	GGG < 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
12 3103	250	200	160	125	115	95	90	65						35	30	100	65	●	●	●	●	●	●

Ø D _c h7	12F 12 3103	L ₂	L	Ø D _s	f	Ø D _c h7	12F 12 3103	L ₂	L	Ø D _s	f
	HOLEX Pro Steel solid carbide drill, plain shank						HOLEX Pro Steel solid carbide drill, plain shank				
	DIN 6535 HA						DIN 6535 HA				
	TiAlN						TiAlN				
mm		mm	mm	mm	mm/rev.	mm		mm	mm	mm	mm/rev.
3	eShop	29.5	72	6	0.13	8,5	eShop	82.3	142	10	0.18
3,1	eShop	29.4	72	6	0.13	8,6	eShop	82.1	142	10	0.18
3,2	eShop	29.2	72	6	0.13	8,7	eShop	82	142	10	0.18
3,3	eShop	29.1	72	6	0.13	8,8	eShop	81.8	142	10	0.18
3,4	eShop	28.9	72	6	0.13	9	eShop	81.5	142	10	0.2
3,5	eShop	28.8	72	6	0.13	9,1	eShop	81.4	142	10	0.2
3,6	eShop	28.6	72	6	0.13	9,2	eShop	81.2	142	10	0.2
3,7	eShop	28.5	72	6	0.13	9,3	eShop	81.1	142	10	0.2
3,8	eShop	37.3	81	6	0.13	9,4	eShop	80.9	142	10	0.2
3,9	eShop	37.2	81	6	0.13	9,5	eShop	80.8	142	10	0.2
4	eShop	37	81	6	0.13	9,6	eShop	80.6	142	10	0.2
4,1	eShop	36.9	81	6	0.13	9,7	eShop	80.5	142	10	0.2
4,2	eShop	36.7	81	6	0.13	9,8	eShop	80.3	142	10	0.2
4,3	eShop	36.6	81	6	0.13	9,9	eShop	80.2	142	10	0.2
4,4	eShop	36.4	81	6	0.13	10	eShop	80	142	10	0.2
4,5	eShop	36.3	81	6	0.13	10,1	eShop	98.9	162	12	0.2
4,6	eShop	36.1	81	6	0.13	10,2	eShop	98.7	162	12	0.2
4,7	eShop	36	81	6	0.13	10,3	eShop	98.6	162	12	0.2
4,8	eShop	49.8	95	6	0.13	10,4	eShop	98.4	162	12	0.2
4,9	eShop	49.7	95	6	0.13	10,5	eShop	98.3	162	12	0.2
5	eShop	49.5	95	6	0.13	10,8	eShop	97.8	162	12	0.2
5,1	eShop	49.4	95	6	0.13	11	eShop	97.5	162	12	0.2
5,2	eShop	49.2	95	6	0.13	11,2	eShop	97.2	162	12	0.2
5,3	eShop	49.1	95	6	0.13	11,3	eShop	97.1	162	12	0.2
5,4	eShop	48.9	95	6	0.13	11,4	eShop	96.9	162	12	0.2
5,5	eShop	48.8	95	6	0.13	11,5	eShop	96.8	162	12	0.2
5,6	eShop	48.6	95	6	0.13	11,7	eShop	96.5	162	12	0.2
5,7	eShop	48.5	95	6	0.13	11,8	eShop	96.3	162	12	0.2
5,8	eShop	48.3	95	6	0.13	12	eShop	96	162	12	0.2
5,9	eShop	48.2	95	6	0.13	12,2	eShop	114.7	178	14	0.23
6	eShop	48	95	6	0.13	12,5	eShop	114.3	178	14	0.23
6,1	eShop	66.9	114	8	0.16	12,8	eShop	113.8	178	14	0.23
6,2	eShop	66.7	114	8	0.16	13	eShop	113.5	178	14	0.23
6,3	eShop	66.6	114	8	0.16	13,5	eShop	112.8	178	14	0.23
6,4	eShop	66.4	114	8	0.16	13,8	eShop	112.3	178	14	0.23
6,5	eShop	66.3	114	8	0.16	14	eShop	112	178	14	0.23
6,6	eShop	66.1	114	8	0.16	14,2	eShop	130.7	203	16	0.23
6,7	eShop	66	114	8	0.16	14,5	eShop	130.3	203	16	0.23
6,8	eShop	65.8	114	8	0.16	14,8	eShop	129.8	203	16	0.23
6,9	eShop	65.7	114	8	0.16	15	eShop	129.5	203	16	0.23
7	eShop	65.5	114	8	0.16	15,1	eShop	129.4	203	16	0.23
7,1	eShop	65.4	114	8	0.16	15,2	eShop	129.2	203	16	0.23
7,2	eShop	65.2	114	8	0.16	15,5	eShop	128.8	203	16	0.23
7,3	eShop	65.1	114	8	0.16	15,8	eShop	128.3	203	16	0.23
7,4	eShop	64.9	114	8	0.16	16	eShop	128	203	16	0.23
7,5	eShop	64.8	114	8	0.16	16,2	eShop	146.7	222	18	0.25
7,6	eShop	64.6	114	8	0.16	16,5	eShop	146.3	222	18	0.25
7,7	eShop	64.5	114	8	0.16	17	eShop	145.5	222	18	0.25
7,8	eShop	64.3	114	8	0.16	17,5	eShop	144.8	222	18	0.25
7,9	eShop	64.2	114	8	0.16	18	eShop	144	222	18	0.25
8	eShop	64	114	8	0.16	18,5	eShop	162.3	243	20	0.25
8,1	eShop	82.9	142	10	0.18	19	eShop	161.5	243	20	0.25
8,2	eShop	82.7	142	10	0.18	19,8	eShop	160.3	243	20	0.25
8,3	eShop	82.6	142	10	0.18	20	eShop	160	243	20	0.25
8,4	eShop	82.4	142	10	0.18						



Garant Solid carbide HPC drill

Cutting chisel edge with **high centring accuracy** due to **strong core and special point geometry**.

Particularly high alignment accuracy due to **4 guide chamfers** which stabilise the drill even at extreme depths!

Straight major cutting edges with honed edges and special flute profile for **short chips**, even on long chipping materials.

Advantage: High process reliability and surface quality of the hole.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
Form HB and HE supplied at the same price as HA.
Form **HB**: order with **No. 123115**.
Form **HE**: order with **No. 123110 + 129100 HE**.



Plain shank DIN 6535 HA

123110

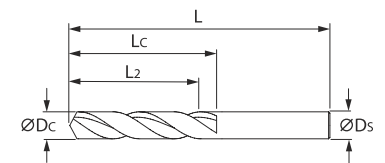


Weldon shank DIN 6535 HB

123115



Whistle-notch shank DIN 6535 HE 123110 + 129100HE



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
123110		200	180	110	80	70								65	55	25							

$\varnothing D_c$ h7	12 3110	L_2	L	$\varnothing D_s$	INOX < 900 N f
	Solid carbide HPC drill plain shank DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.
1	eShop	13.5	45	4	0.05
1,1	eShop	13.4	45	4	0.05
1,2	eShop	13.2	45	4	0.05
1,3	eShop	13.1	45	4	0.05
1,4	eShop	12.9	45	4	0.05
1,5	eShop	17.8	50	4	0.05
1,6	eShop	17.6	50	4	0.05
1,7	eShop	17.5	50	4	0.05
1,8	eShop	17.3	50	4	0.05
1,9	eShop	21.2	55	4	0.05
2	eShop	21	55	4	0.05
2,1	eShop	20.9	55	4	0.05
2,2	eShop	20.7	55	4	0.05
2,3	eShop	25.6	60	4	0.05
2,4	eShop	25.4	60	4	0.05
2,5	eShop	25.3	60	4	0.05
2,6	eShop	25.1	60	4	0.05
2,7	eShop	30	65	4	0.05
2,8	eShop	29.8	65	4	0.05
2,9	eShop	29.7	65	4	0.05
3	eShop	35.5	80	6	0.05
3,3	eShop	35.1	80	6	0.08
3,5	eShop	34.8	80	6	0.08
3,8	eShop	42.3	86	6	0.08
4	eShop	42	86	6	0.08
4,2	eShop	41.7	86	6	0.08
4,5	eShop	41.3	86	6	0.08
4,8	eShop	54.8	100	6	0.08
5	eShop	54.5	100	6	0.08
5,1	eShop	54.4	100	6	0.12
5,2	eShop	54.2	100	6	0.12
5,5	eShop	53.8	100	6	0.12
5,7	eShop	61.5	110	6	0.12
5,8	eShop	61.3	110	6	0.12
5,9	eShop	61.2	110	6	0.12
6	eShop	61	110	6	0.12
6,2	eShop	65.7	114	8	0.12
6,3	eShop	65.6	114	8	0.12
6,5	eShop	65.3	114	8	0.12
6,6	eShop	65.1	114	8	0.12
6,7	eShop	65	114	8	0.12
6,8	eShop	64.8	114	8	0.12
6,9	eShop	64.7	114	8	0.12

$\varnothing D_c$ h7	12 3110	L_2	L	$\varnothing D_s$	INOX < 900 N f
	Solid carbide HPC drill plain shank DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.
7	eShop	64.5	114	8	0.12
7,1	eShop	80.4	130	8	0.12
7,5	eShop	79.8	130	8	0.12
7,6	eShop	79.6	130	8	0.12
7,7	eShop	79.5	130	8	0.12
7,8	eShop	79.3	130	8	0.12
8	eShop	79	130	8	0.12
8,1	eShop	94.9	150	10	0.15
8,2	eShop	94.7	150	10	0.15
8,4	eShop	94.4	150	10	0.15
8,5	eShop	94.3	150	10	0.15
8,6	eShop	94.1	150	10	0.15
8,7	eShop	94	150	10	0.15
9	eShop	93.5	150	10	0.15
9,3	eShop	93.1	150	10	0.15
9,4	eShop	92.9	150	10	0.15
9,5	eShop	92.8	150	10	0.15
9,8	eShop	92.3	150	10	0.15
10	eShop	92	150	10	0.15
10,2	eShop	114.7	180	12	0.15
10,5	eShop	114.3	180	12	0.15
10,8	eShop	113.8	180	12	0.15
11	eShop	113.5	180	12	0.15
11,2	eShop	113.2	180	12	0.15
11,5	eShop	112.8	180	12	0.15
11,8	eShop	112.3	180	12	0.15
12	eShop	112	180	12	0.15
12,2	eShop	141.7	208	14	0.2
12,5	eShop	141.3	208	14	0.2
13	eShop	140.5	208	14	0.2
13,5	eShop	139.8	208	14	0.2
14	eShop	139	208	14	0.2
14,2	eShop	164.7	236	16	0.2
15	eShop	163.5	236	16	0.2
15,5	eShop	162.8	236	16	0.2
15,8	eShop	162.3	236	16	0.2
16	eShop	162	236	16	0.2
16,5	eShop	185.3	262	18	0.25
17	eShop	184.5	262	18	0.25
17,5	eShop	183.8	262	18	0.25
18	eShop	183	262	18	0.25
19,5	eShop	204.8	286	20	0.25
20	eShop	204	286	20	0.25

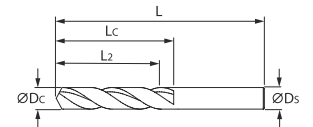
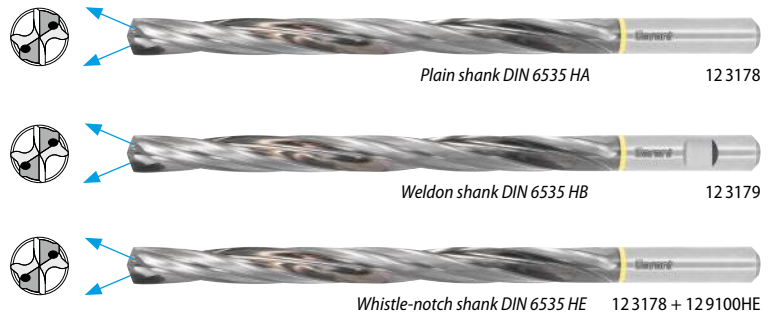


Garant Solid carbide HPC drill

DLC coating sp^2 of the latest generation with **low coefficient of friction** results in **outstanding chip clearance**. For **high-performance milling of aluminium materials**. **High roundness** and **alignment accuracy of the deep hole**, thanks to **6 guide chamfers**.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.
For process reliability when using the 12xD drill, an initial centre drilling with NC spotting drills No. 121068– 121130 is necessary.
Form HB and HE are supplied at the same price as HA.
Order form **HB**: with **No. 123179**.
Order form **HE**: with **No. 123178 + 129100HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	Cu	CuZn	GRP	CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
123178	250	280	245	105			85			60		55	50	55	120	150	55	55					

Ø D _c h7	12 3178	L ₂	L	Ø D _s	Alu f
	Solid carbide HPC drill, plain shank				
	DIN 6535 HA				
mm	DLC	mm	mm	mm	mm/rev.
2	eShop	31	72	4	0.2
2,1	eShop	30.9	72	4	0.22
2,2	eShop	30.7	72	4	0.22
2,3	eShop	30.6	72	4	0.22
2,4	eShop	36.4	81	4	0.22
2,5	eShop	36.3	81	4	0.22
2,6	eShop	36.1	81	4	0.22
2,7	eShop	38	81	4	0.22
2,8	eShop	37.8	81	4	0.22
2,9	eShop	37.7	81	4	0.22
3	eShop	49.5	92	6	0.22
3,1	eShop	49.4	92	6	0.35
3,2	eShop	49.2	92	6	0.35
3,3	eShop	49.1	92	6	0.35
3,4	eShop	48.9	92	6	0.35
3,5	eShop	48.8	92	6	0.35
3,6	eShop	48.6	92	6	0.35
3,7	eShop	48.5	92	6	0.35
3,8	eShop	58.3	102	6	0.35
3,9	eShop	58.2	102	6	0.35
4	eShop	58	102	6	0.35
4,1	eShop	57.9	102	6	0.35
4,2	eShop	57.7	102	6	0.35
4,3	eShop	57.6	102	6	0.35
4,4	eShop	57.4	102	6	0.35
4,5	eShop	57.3	102	6	0.35
4,6	eShop	57.1	102	6	0.35
4,7	eShop	57	102	6	0.35
4,8	eShop	70.8	116	6	0.35
4,9	eShop	70.7	116	6	0.35
5	eShop	70.5	116	6	0.35
5,1	eShop	70.4	116	6	0.45
5,2	eShop	70.2	116	6	0.45
5,3	eShop	70.1	116	6	0.45
5,4	eShop	69.9	116	6	0.45
5,5	eShop	69.8	116	6	0.45
5,6	eShop	69.6	116	6	0.45
5,7	eShop	69.5	116	6	0.45
5,8	eShop	69.3	116	6	0.45
5,9	eShop	69.2	116	6	0.45
6	eShop	69	116	6	0.45
6,1	eShop	98.9	146	8	0.45
6,2	eShop	98.7	146	8	0.45
6,3	eShop	98.6	146	8	0.45
6,4	eShop	98.4	146	8	0.45
6,5	eShop	98.3	146	8	0.45
6,6	eShop	98.1	146	8	0.45
6,7	eShop	98	146	8	0.45
6,8	eShop	97.8	146	8	0.45
6,9	eShop	97.7	146	8	0.45
7	eShop	97.5	146	8	0.45

Ø D _c h7	12 3178	L ₂	L	Ø D _s	Alu f
	Solid carbide HPC drill, plain shank				
	DIN 6535 HA				
mm	DLC	mm	mm	mm	mm/rev.
7,1	eShop	97.4	146	8	0.45
7,2	eShop	97.2	146	8	0.45
7,3	eShop	97.1	146	8	0.45
7,4	eShop	96.9	146	8	0.45
7,5	eShop	96.8	146	8	0.45
7,6	eShop	96.6	146	8	0.45
7,7	eShop	96.5	146	8	0.45
7,8	eShop	96.3	146	8	0.45
7,9	eShop	96.2	146	8	0.45
8	eShop	96	146	8	0.45
8,1	eShop	107.9	162	10	0.55
8,2	eShop	107.7	162	10	0.55
8,3	eShop	107.6	162	10	0.55
8,4	eShop	107.4	162	10	0.55
8,5	eShop	107.3	162	10	0.55
8,6	eShop	107.1	162	10	0.55
8,7	eShop	107	162	10	0.55
8,8	eShop	106.8	162	10	0.55
8,9	eShop	106.7	162	10	0.55
9	eShop	106.5	162	10	0.55
9,1	eShop	106.4	162	10	0.55
9,2	eShop	106.2	162	10	0.55
9,3	eShop	106.1	162	10	0.55
9,4	eShop	105.9	162	10	0.55
9,5	eShop	105.8	162	10	0.55
9,6	eShop	105.6	162	10	0.55
9,7	eShop	105.5	162	10	0.55
9,8	eShop	105.3	162	10	0.55
9,9	eShop	105.2	162	10	0.55
10	eShop	105	162	10	0.55
10,2	eShop	140.7	204	12	0.55
10,5	eShop	140.3	204	12	0.55
10,8	eShop	139.8	204	12	0.55
11	eShop	139.5	204	12	0.55
11,5	eShop	138.8	204	12	0.55
11,8	eShop	138.3	204	12	0.55
12	eShop	138	204	12	0.55
12,5	eShop	163.3	230	14	0.65
12,8	eShop	162.8	230	14	0.65
13	eShop	162.5	230	14	0.65
13,5	eShop	161.8	230	14	0.65
13,8	eShop	161.3	230	14	0.65
14	eShop	161	230	14	0.65
14,5	eShop	186.3	260	16	0.65
14,8	eShop	185.8	260	16	0.65
15	eShop	185.5	260	16	0.65
15,5	eShop	184.8	260	16	0.65
15,8	eShop	184.3	260	16	0.65
16	eShop	184	260	16	0.65
16,5	eShop	209.3	285	18	0.7
16,8	eShop	208.8	285	18	0.7



Garant Solid carbide HPC drill with 4 cooling channels

Cutting chisel edge with **high centring accuracy** due to **strong core and special point geometry**.

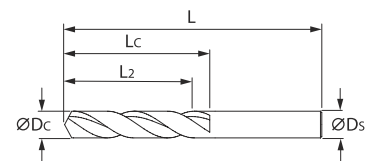
High roundness and alignment accuracy of the deep hole, thanks to **4 guide chamfers**.

Outstanding chip evacuation due to **4 internal cooling channels** from Ø 3.8 mm.

Up to 3.7 mm Ø with 2 internal cooling channels.

Straight major cutting edges with honed edges and special flute profile for **short chips**, even on long chipping materials.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
For process reliability when using the 12xD drill, an initial centre drilling with NC spotting drills No. 121068–121130 is necessary.
Form HB and HE are supplied at the same price as HA.
Order form **HB**: with **No. 123214**.
Order form **HE**: with **No. 123212 + 129100HE**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
12 3212				90	75	70	55	32						70	60								

Ø D _c m6	12 3212	L ₂	L	Ø D _s	INOX > 900 N f
(mm or inch)	Solid carbide HPC drill plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.
3	eShop	49.5	92	6	0.06
3,3	eShop	49.1	92	6	0.06
3,4	eShop	48.9	92	6	0.06
3,5	eShop	48.8	92	6	0.06
3,7	eShop	48.5	92	6	0.06
3,8	eShop	58.3	102	6	0.06
4	eShop	58	102	6	0.08
4,2	eShop	57.7	102	6	0.08
4,5	eShop	57.3	102	6	0.08
3/16	eShop	70.8	116	6	0.08
4,8	eShop	70.8	116	6	0.08
5	eShop	70.5	116	6	0.08
5,5	eShop	69.8	116	6	0.12
7/32	eShop	69.3	116	6	0.12
5,8	eShop	69.3	116	6	0.12
6	eShop	69	116	6	0.12
6,3	eShop	98.6	146	8	0.12
1/4	eShop	69	146	8	0.12
6,35	eShop	98.5	146	8	0.12
6,5	eShop	98.3	146	8	0.12
6,6	eShop	98.1	146	8	0.12
6,8	eShop	97.8	146	8	0.12
7	eShop	97.5	146	8	0.12
9/32	eShop	97.5	146	8	0.12
7,5	eShop	96.8	146	8	0.12
7,8	eShop	96.3	146	8	0.12
5/16	eShop	96.3	146	8	0.12

Ø D _c m6	12 3212	L ₂	L	Ø D _s	INOX > 900 N f
(mm or inch)	Solid carbide HPC drill plain shank DIN 6535 HA TiAlN	mm	mm	mm	mm/rev.
8	eShop	96	146	8	0.12
8,2	eShop	107.7	162	10	0.15
8,5	eShop	107.3	162	10	0.15
11/32	eShop	107.3	162	10	0.15
9	eShop	106.5	162	10	0.15
9,5	eShop	105.8	162	10	0.15
3/8	eShop	105.3	162	10	0.15
9,8	eShop	105.3	162	10	0.15
10	eShop	105	162	10	0.15
13/32	eShop	140.3	204	12	0.15
10,5	eShop	140.3	204	12	0.15
11	eShop	139.5	204	12	0.15
7/16	eShop	138.8	204	12	0.15
11,5	eShop	138.8	204	12	0.15
11,8	eShop	138.3	204	12	0.15
12	eShop	138	204	12	0.15
1/2	eShop	162.5	230	14	0.2
12,7	eShop	163	230	14	0.2
13	eShop	162.5	230	14	0.2
13,5	eShop	161.8	230	14	0.2
14	eShop	161	230	14	0.2
9/16	eShop	185.8	260	16	0.2
14,8	eShop	185.8	260	16	0.2
5/8	eShop	184	260	16	0.2
16	eShop	184	260	16	0.2
17,5	eShop	207.8	285	18	0.25



GARANT Master Steel Speed solid carbide drill

Developed for use with **very high cutting speeds**.

Outstandingly suitable for machines with **low installed power** and high speeds.

- Clear reduction in cutting forces due to special cutter geometry.
- Coating for best wear resistance even at high process temperatures.
- Polished flutes for good chip clearance.

A **slim chisel point** and the **special arrangement of the 4 guide chamfers** ensure **high positioning and alignment accuracy**.

Optimised micro-geometry for increased working life and performance capability.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

For process reliability when using the 12xD drill, an initial centre drilling with NC spotting drills No. 121068 – 121130 is necessary.

Form HB and HE are supplied at the same price as HA.

Order form **HB**: with **No. 123226**.

Order form **HE**: with **No. 123225 + 129100HE**.



Plain shank DIN 6535 HA

12 3225



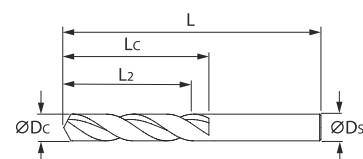
Weldon shank DIN 6535 HB

12 3226



Whistle-notch shank DIN 6535 HE

12 3225 + 129100HE



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX > 900 N	INOX > 900 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	K	K						
12 3225				160	125	115	105	65	H	H	H	H	55		100	95						

Ø D _c h7	TiE	12 3225				L ₂	L	Ø D _s		f
		GARANT Master Steel Speed solid carbide drill, plain shank								
		DIN 6535 HA								
mm	TiAlN	mm	mm	mm	mm/rev.	mm	mm	mm	mm/rev.	
3	eShop	49.5	92	6	0.09					
3,1	eShop	49.4	92	6	0.09					
3,2	eShop	49.2	92	6	0.09					
3,3	eShop	49.1	92	6	0.09					
3,4	eShop	48.9	92	6	0.09					
3,5	eShop	48.8	92	6	0.09					
3,6	eShop	48.6	92	6	0.09					
3,7	eShop	48.5	92	6	0.09					
3,8	eShop	58.3	102	6	0.09					
3,9	eShop	58.2	102	6	0.09					
4	eShop	58	102	6	0.09					
4,1	eShop	57.9	102	6	0.1					
4,2	eShop	57.7	102	6	0.1					
4,3	eShop	57.6	102	6	0.1					
4,4	eShop	57.4	102	6	0.1					
4,5	eShop	57.3	102	6	0.1					
4,6	eShop	57.1	102	6	0.1					
4,7	eShop	57	102	6	0.1					
4,8	eShop	70.8	116	6	0.1					
4,9	eShop	70.7	116	6	0.1					
5	eShop	70.5	116	6	0.1					
5,1	eShop	70.4	116	6	0.125					
5,2	eShop	70.2	116	6	0.125					
5,3	eShop	70.1	116	6	0.125					
5,4	eShop	69.9	116	6	0.125					
5,5	eShop	69.8	116	6	0.125					
5,6	eShop	69.6	116	6	0.125					
5,7	eShop	69.5	116	6	0.125					
5,8	eShop	69.3	116	6	0.125					
5,9	eShop	69.2	116	6	0.125					
6	eShop	69	116	6	0.125					
6,1	eShop	98.9	146	8	0.15					
6,2	eShop	98.7	146	8	0.15					
6,3	eShop	98.6	146	8	0.15					
6,4	eShop	98.4	146	8	0.15					
6,5	eShop	98.3	146	8	0.15					
6,6	eShop	98.1	146	8	0.15					
6,7	eShop	98	146	8	0.15					
6,8	eShop	97.8	146	8	0.15					

Ø D _c h7	TiE	12 3225				L ₂	L	Ø D _s		f
		GARANT Master Steel Speed solid carbide drill, plain shank								
		DIN 6535 HA								
mm	TiAlN	mm	mm	mm	mm/rev.	mm	mm	mm	mm/rev.	
6,9	eShop	97.7	146	8	0.15					
7	eShop	97.5	146	8	0.15					
7,1	eShop	97.4	146	8	0.15					
7,2	eShop	97.2	146	8	0.15					
7,3	eShop	97.1	146	8	0.15					
7,4	eShop	96.9	146	8	0.15					
7,5	eShop	96.8	146	8	0.15					
7,6	eShop	96.6	146	8	0.15					
7,7	eShop	96.5	146	8	0.15					
7,8	eShop	96.3	146	8	0.15					
7,9	eShop	96.2	146	8	0.15					
8	eShop	96	146	8	0.15					
8,1	eShop	107.9	162	10	0.18					
8,2	eShop	107.7	162	10	0.18					
8,3	eShop	107.6	162	10	0.18					
8,4	eShop	107.4	162	10	0.18					
8,5	eShop	107.3	162	10	0.18					
8,6	eShop	107.1	162	10	0.18					
8,7	eShop	107	162	10	0.18					
8,8	eShop	106.8	162	10	0.18					
8,9	eShop	106.7	162	10	0.18					
9	eShop	106.5	162	10	0.18					
9,1	eShop	106.4	162	10	0.18					
9,2	eShop	106.2	162	10	0.18					
9,3	eShop	106.1	162	10	0.18					
9,4	eShop	105.9	162	10	0.18					
9,5	eShop	105.8	162	10	0.18					
9,6	eShop	105.6	162	10	0.18					
9,7	eShop	105.5	162	10	0.18					
9,8	eShop	105.3	162	10	0.18					
9,9	eShop	105.2	162	10	0.18					
10	eShop	105	162	10	0.18					
10,1	eShop	140.9	204	12	0.2					
10,2	eShop	140.7	204	12	0.2					
10,3	eShop	140.6	204	12	0.2					
10,4	eShop	140.4	204	12	0.2					
10,5	eShop	140.3	204	12	0.2					
10,6	eShop	140.1	204	12	0.2					
10,7	eShop	140	204	12	0.2					

Ø D _c h7	TiE	12 3225				L ₂	L	Ø D _s		f
		GARANT Master Steel Speed solid carbide drill, plain shank								
		DIN 6535 HA								
mm	TiAlN	mm	mm	mm	mm/rev.	mm	mm	mm	mm/rev.	
10,8	eShop	139.8	204	12	0.2					
10,9	eShop	139.7	204	12	0.2					
11	eShop	139.5	204	12	0.2					
11,1	eShop	139.4	204	12	0.2					
11,2	eShop	139.2	204	12	0.2					
11,3	eShop	139.1	204	12	0.2					
11,4	eShop	138.9	204	12	0.2					
11,5	eShop	138.8	204	12	0.2					
11,6	eShop	138.6	204	12	0.2					
11,7	eShop	138.5	204	12	0.2					
11,8	eShop	138.3	204	12	0.2					
11,9	eShop	138.2	204	12	0.2					
12	eShop	138	204	12	0.2					
12,2	eShop	163.7	230	14	0.23					
12,5	eShop	163.3	230	14	0.23					
12,8	eShop	162.8	230	14	0.23					
13	eShop	162.5	230	14	0.23					
13,2	eShop	162.2	230	14	0.23					
13,5	eShop	161.8	230	14	0.23					
13,8	eShop	161.3	230	14	0.23					
14	eShop	161	230	14	0.23					
14,2	eShop	186.7	260	16	0.26					
14,5	eShop	186.3	260	16	0.26					
14,8	eShop	185.8	260	16	0.26					
15	eShop	185.5	260	16	0.26					
15,2	eShop	185.2	260	16	0.26					
15,5	eShop	184.8	260	16	0.26					
15,8	eShop	184.3	260	16	0.26					
16	eShop	184	260	16	0.26					
16,2	eShop	209.7	285	18	0.29					
17	eShop	208.5	285	18	0.29					
17,2	eShop	208.2	285	18	0.29					
18	eShop	207	285	18	0.29					
18,8	eShop	229.8	310	20	0.325					
19	eShop	229.5	310	20	0.325					
19,8	eShop	228.3	310	20	0.325					
20	eShop	228	310	20	0.325					



GARANT Master Steel Feed solid carbide drill

3-flute drill, specially developed for **use at very high feed rates**.

Outstandingly suitable for **machines with high installed power** and stable operating conditions.

- Special cutter geometry with stable cutting edges and large clearance at the centre enables very high feed rates.
- The patented tip is optimised for chip flow and generates low cutting pressure with good chip breakage.

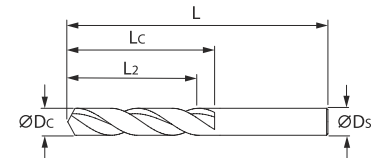
The **sector-leading technology of the drill point** guarantees **optimum self-centring behaviour**. 3 guide chamfers guarantee a stable exit from the hole and an exact roundness of the hole.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$.
For process reliability when using the 12xD drill, an initial centre drilling with an NC spotting drill No. 121130 with **155° point angle** is necessary.



Plain shank DIN 6535 HA

12 3235



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG < 1100 N	GGG < 1100 N	Uni < 1100 N					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	K						
12 3235				120	110	100	90	70	60				55	50	40	120	80						

$\varnothing D_c$ h7	12 3235	L_2	L	$\varnothing D_s$	f	$\varnothing D_c$ h7	12 3235	L_2	L	$\varnothing D_s$	f	$\varnothing D_c$ h7	12 3235	L_2	L	$\varnothing D_s$	f
	GARANT Master Steel Feed solid carbide drill, plain shank						GARANT Master Steel Feed solid carbide drill, plain shank						GARANT Master Steel Feed solid carbide drill, plain shank				
	DIN 6535 HA						DIN 6535 HA						DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.
4	eShop	58	102	6	0.28	7,8	eShop	96.3	146	8	0.37	11,6	eShop	138.6	204	12	0.5
4,1	eShop	57.9	102	6	0.28	7,9	eShop	96.2	146	8	0.37	11,7	eShop	138.5	204	12	0.5
4,2	eShop	57.7	102	6	0.28	8	eShop	96	146	8	0.37	11,8	eShop	138.3	204	12	0.5
4,3	eShop	57.6	102	6	0.28	8,1	eShop	107.9	162	10	0.44	11,9	eShop	138.2	204	12	0.5
4,4	eShop	57.4	102	6	0.28	8,2	eShop	107.7	162	10	0.44	12	eShop	138	204	12	0.5
4,5	eShop	57.3	102	6	0.28	8,3	eShop	107.6	162	10	0.44	12,2	eShop	163.7	230	14	0.56
4,6	eShop	57.1	102	6	0.28	8,4	eShop	107.4	162	10	0.44	12,5	eShop	163.3	230	14	0.56
4,7	eShop	57	102	6	0.28	8,5	eShop	107.3	162	10	0.44	12,8	eShop	162.8	230	14	0.56
4,8	eShop	70.8	116	6	0.28	8,6	eShop	107.1	162	10	0.44	13	eShop	162.5	230	14	0.56
4,9	eShop	70.7	116	6	0.28	8,7	eShop	107	162	10	0.44	13,2	eShop	162.2	230	14	0.56
5	eShop	70.5	116	6	0.28	8,8	eShop	106.8	162	10	0.44	13,5	eShop	161.8	230	14	0.56
5,1	eShop	70.4	116	6	0.32	8,9	eShop	106.7	162	10	0.44	13,8	eShop	161.3	230	14	0.56
5,2	eShop	70.2	116	6	0.32	9	eShop	106.5	162	10	0.44	14	eShop	161	230	14	0.56
5,3	eShop	70.1	116	6	0.32	9,1	eShop	106.4	162	10	0.44	14,2	eShop	186.7	260	16	0.61
5,4	eShop	69.9	116	6	0.32	9,2	eShop	106.2	162	10	0.44	14,5	eShop	186.3	260	16	0.61
5,5	eShop	69.8	116	6	0.32	9,3	eShop	106.1	162	10	0.44	14,8	eShop	185.8	260	16	0.61
5,6	eShop	69.6	116	6	0.32	9,4	eShop	105.9	162	10	0.44	15	eShop	185.5	260	16	0.61
5,7	eShop	69.5	116	6	0.32	9,5	eShop	105.8	162	10	0.44	15,2	eShop	185.2	260	16	0.61
5,8	eShop	69.3	116	6	0.32	9,6	eShop	105.6	162	10	0.44	15,5	eShop	184.8	260	16	0.61
5,9	eShop	69.2	116	6	0.32	9,7	eShop	105.5	162	10	0.44	15,8	eShop	184.3	260	16	0.61
6	eShop	69	116	6	0.32	9,8	eShop	105.3	162	10	0.44	16	eShop	184	260	16	0.61
6,1	eShop	98.9	146	8	0.37	9,9	eShop	105.2	162	10	0.44	16,2	eShop	209.7	285	18	0.66
6,2	eShop	98.7	146	8	0.37	10	eShop	105	162	10	0.44	16,5	eShop	209.3	285	18	0.66
6,3	eShop	98.6	146	8	0.37	10,1	eShop	140.9	204	12	0.5	16,8	eShop	208.8	285	18	0.66
6,4	eShop	98.4	146	8	0.37	10,2	eShop	140.7	204	12	0.5	17	eShop	208.5	285	18	0.66
6,5	eShop	98.3	146	8	0.37	10,3	eShop	140.6	204	12	0.5	17,2	eShop	208.2	285	18	0.66
6,6	eShop	98.1	146	8	0.37	10,4	eShop	140.4	204	12	0.5	17,5	eShop	207.8	285	18	0.66
6,7	eShop	98	146	8	0.37	10,5	eShop	140.3	204	12	0.5	17,8	eShop	207.3	285	18	0.66
6,8	eShop	97.8	146	8	0.37	10,6	eShop	140.1	204	12	0.5	18	eShop	207	285	18	0.66
6,9	eShop	97.7	146	8	0.37	10,7	eShop	140	204	12	0.5	18,2	eShop	230.7	310	20	0.69
7	eShop	97.5	146	8	0.37	10,8	eShop	139.8	204	12	0.5	18,5	eShop	230.3	310	20	0.69
7,1	eShop	97.4	146	8	0.37	10,9	eShop	139.7	204	12	0.5	18,8	eShop	229.8	310	20	0.69
7,2	eShop	97.2	146	8	0.37	11	eShop	139.5	204	12	0.5	19	eShop	229.5	310	20	0.69
7,3	eShop	97.1	146	8	0.37	11,1	eShop	139.4	204	12	0.5	19,2	eShop	229.2	310	20	0.69
7,4	eShop	96.9	146	8	0.37	11,2	eShop	139.2	204	12	0.5	19,5	eShop	228.8	310	20	0.69
7,5	eShop	96.8	146	8	0.37	11,3	eShop	139.1	204	12	0.5	19,8	eShop	228.3	310	20	0.69
7,6	eShop	96.6	146	8	0.37	11,4	eShop	138.9	204	12	0.5	20	eShop	228	310	20	0.69
7,7	eShop	96.5	146	8	0.37	11,5	eShop	138.8	204	12	0.5						



GARANT Master Steel solid carbide high-performance drill

Robust drill design and optimised special point geometry for the **best possible chip formation and reliable chip breakage** with **higher feed rates at the same time. Advanced micro-geometry, convex** cutting edge and **conical profile grinding** to provide additional stability for the main cutting edge. **Optimised flute geometry and patented face geometry** for **reliable chip evacuation** in steel materials and cast material. **High-performance coating** of the latest generation.

Note:

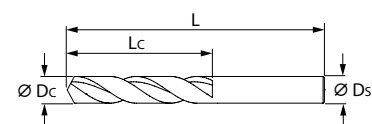
Flute length $L_c = L_2 + 1.5 \times D_c$.

For process reliability when using the 12xD drill, an initial centre drilling with No. 121068 – 121130 is recommended.

HB and **HE** shanks are available at the same price as HA.

For **HB shanks**: use order **no. 123241**.

For **HE shanks**: use order **No. 123240 + 129100HE**.



Suitable for/ v_c [m/min]	Alu plastics 	Alu cast > 10% Si 	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	K						
12 3240				130	120	110	100	80								95	●	●	●	●	●	

$\varnothing D_c$ h7	12 3240	L_2	L	$\varnothing D_s$	 f < 1100 N
	GARANT Master Steel solid carbide high-performance drill, plain shank				
	DIN 6535 HA				
mm	TIAlN	mm	mm	mm	mm/rev.
3	eShop	49.5	92	6	0.11
3,3	eShop	49.1	92	6	0.12
3,4	eShop	48.9	92	6	0.12
3,5	eShop	48.8	92	6	0.13
3,8	eShop	58.3	102	6	0.13
4	eShop	58	102	6	0.14
4,2	eShop	57.7	102	6	0.14
4,5	eShop	57.3	102	6	0.15
4,8	eShop	70.8	116	6	0.16
5	eShop	70.5	116	6	0.16
5,5	eShop	69.8	116	6	0.17
5,8	eShop	69.3	116	6	0.18
6	eShop	69	116	6	0.18
6,3	eShop	98.6	146	8	0.19
6,5	eShop	98.3	146	8	0.19
6,6	eShop	98.1	146	8	0.19
6,8	eShop	97.8	146	8	0.2
7	eShop	97.5	146	8	0.2
7,8	eShop	96.3	146	8	0.22
8	eShop	96	146	8	0.22
8,5	eShop	107.3	162	10	0.23
9	eShop	106.5	162	10	0.24
10	eShop	105	162	10	0.26
10,5	eShop	140.3	204	12	0.27
11	eShop	139.5	204	12	0.28
11,5	eShop	138.8	204	12	0.29
12	eShop	138	204	12	0.29
13	eShop	162.5	230	14	0.31
13,5	eShop	161.8	230	14	0.32
14	eShop	161	230	14	0.33



HOLEX Pro Steel solid carbide high-performance drill

Straight major cutting edges and a special flute profile ensure good chip evacuation. The robust cutter geometry ensures high-performance drilling with good process reliability. A wide range of applications in steel materials thanks to a combination of tough ultra-fine grain carbide and extremely wear-resistant coating.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

HB and HE shanks are available at the same price as HA.

For **HB shanks**: use order **no. 123304**.

For **HE shanks**: use order **no. 123309**.

For process reliability when using the 12xD drill, an initial centre drilling with NC spotting drills No. 121068 - 121130 or HOLEX Pro Steel No. 122501 is necessary.



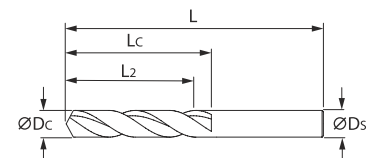
Plain shank DIN 6535 HA 12 3303



Weldon shank DIN 6535 HB 12 3304



Whistle-Notch shank DIN 6535 HE 12 3309



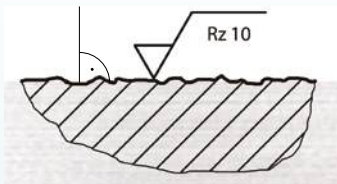
Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG < 900 N	GGG < 900 N	Uni	Oil	Water	Emulsion	High Pressure	High Speed
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K	●	●	●	●	●	●
12 3303	250	200	160	125	115	95	90	65						35	30	100	65	●	●	●	●	●	●

Ø D _c h7	12F 12 3303	L ₂	L	Ø D _s	 f	Ø D _c h7	12F 12 3303	L ₂	L	Ø D _s	 f
	HOLEX Pro Steel solid carbide drill, plain shank						HOLEX Pro Steel solid carbide drill, plain shank				
	DIN 6535 HA						DIN 6535 HA				
mm	TiAlN	mm	mm	mm	mm/rev.	mm	TiAlN	mm	mm	mm	mm/rev.
3	eShop	49.5	92	6	0.13	7,4	eShop	97.5	146	8	0.16
3,1	eShop	49.4	92	6	0.13	7,5	eShop	96.8	146	8	0.16
3,3	eShop	49.1	92	6	0.13	7,7	eShop	96.3	146	8	0.16
3,4	eShop	48.9	92	6	0.13	7,8	eShop	96.3	146	8	0.16
3,5	eShop	48.8	92	6	0.13	8	eShop	96	146	8	0.16
3,6	eShop	48.6	92	6	0.13	8,1	eShop	107.9	162	10	0.18
3,7	eShop	48.5	92	6	0.13	8,2	eShop	107.7	162	10	0.18
3,8	eShop	58.3	102	6	0.13	8,5	eShop	107.3	162	10	0.18
4	eShop	58	102	6	0.13	8,6	eShop	107.3	162	10	0.18
4,1	eShop	58	102	6	0.13	9	eShop	107	162	10	0.2
4,2	eShop	57.7	102	6	0.13	9,1	eShop	107	162	10	0.2
4,3	eShop	57.6	102	6	0.13	9,5	eShop	105.8	162	10	0.2
4,4	eShop	57.4	102	6	0.13	9,8	eShop	105.3	162	10	0.2
4,5	eShop	57.3	102	6	0.13	9,9	eShop	105.3	162	10	0.2
4,6	eShop	57.3	102	6	0.13	10	eShop	105	162	10	0.2
4,7	eShop	57.3	102	6	0.13	10,1	eShop	140.9	204	12	0.2
4,8	eShop	70.8	116	6	0.13	10,2	eShop	140.7	204	12	0.2
5	eShop	70.5	116	6	0.13	10,3	eShop	140.6	204	12	0.2
5,1	eShop	70.5	116	6	0.13	10,5	eShop	140.3	204	12	0.2
5,2	eShop	70.5	116	6	0.13	11	eShop	139.5	204	12	0.2
5,3	eShop	70.5	116	6	0.13	11,2	eShop	139.5	204	12	0.2
5,5	eShop	69.8	116	6	0.13	11,3	eShop	139.5	204	12	0.2
5,6	eShop	69.8	116	6	0.13	11,5	eShop	138.8	204	12	0.2
5,7	eShop	69.8	116	6	0.13	11,8	eShop	138.3	204	12	0.2
5,8	eShop	69.3	116	6	0.13	12	eShop	138	204	12	0.2
5,9	eShop	69.3	116	6	0.13	12,5	eShop	163.3	230	14	0.23
6	eShop	69	116	6	0.13	13	eShop	162.5	230	14	0.23
6,1	eShop	98.9	146	8	0.16	13,5	eShop	161.8	230	14	0.23
6,2	eShop	98.7	146	8	0.16	14	eShop	161	230	14	0.23
6,3	eShop	98.6	146	8	0.16	14,5	eShop	184.3	260	16	0.23
6,4	eShop	98.6	146	8	0.16	14,8	eShop	184.3	260	16	0.23
6,5	eShop	98.3	146	8	0.16	15	eShop	184.3	260	16	0.23
6,6	eShop	98.1	146	8	0.16	15,8	eShop	184.3	260	16	0.23
6,8	eShop	97.8	146	8	0.16	16	eShop	184	260	16	0.23
6,9	eShop	97.8	146	8	0.16	17	eShop	208.5	285	18	0.25
7	eShop	97.5	146	8	0.16	17,5	eShop	207.8	285	18	0.25
7,2	eShop	97.5	146	8	0.16	18	eShop	207.8	285	18	0.25

Reliable deep hole drilling in 4 working steps

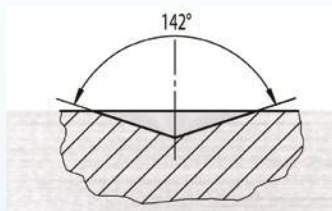
Precondition: Face milling

At a right angle to the hole axis, with the lowest possible **surface roughness**.



1. Centring

NC spotting drill with 142° point angle for **exact pitch or for special applications**.



NC spot drilling is advisable for process reliability.
(12 1068 – 12 1121)

2. Drilling of pilot hole

Necessary for guidance of the deep hole drill in the component. The use of a pilot hole eases the subsequent deep hole drilling operation and improves the tool life of the deep hole drill. The correct generation of a pilot hole is a necessary part of the production technique. It ensures process reliability and reduces the costs.

GARANT drilling system:

Garant MASTER STEEL MICRO

8xD – 30xD (No. 12 1224, 12 1226, 12 1228, 12 1231)

Garant MASTER STEEL DEEP

16xD – 30xD (No. 12 3888 – 12 3895)

Garant HPC deep hole drill

ALU 16xD – 30xD (No. 12 3588 – 12 3595)

UNI 16xD – 30xD (No. 12 3688 – 12 3695)

Garant Single-lip drills

500 mm – 1000 mm (No. 12 4002 – 12 4010)

Garant HPC deep hole drill

UNI 40xD – 50xD (No. 12 3740 – 12 3750)

Pilot hole and co-pilot hole required!

suitable GARANT pilot drill

12 1223

For vertical machining and regular and straight surfaces, a pilot hole is not necessary from Ø 1.0 and up to a drilling depth of 12xD.

12 2736

12 2606

12 2736

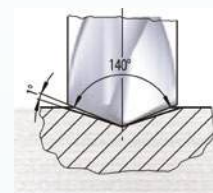
12 2736

23 1605

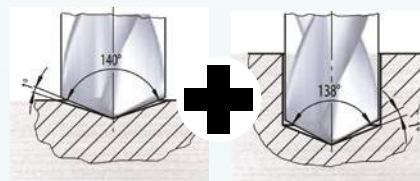
12 2736

12 3691

Use the co-pilot drill in the same way as a regular deep hole drill (see step 4 – deep hole drilling). Make each hole separately. Ensure chip clearance within the co-pilot hole.



Pilot hole to maximum drilling depth (min. 4xD)



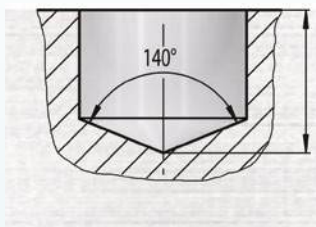
Pilot hole to maximum drilling depth (min. 4xD)

additional co-pilot hole (up to 20xD)

3. Countersinking

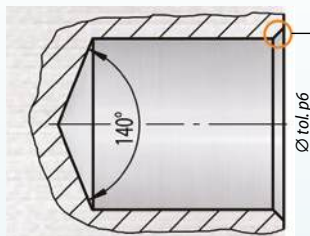
Vertical machining:

Countersink optional, recommended for difficult applications.



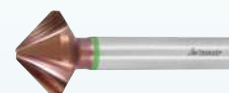
Horizontal machining:

After drilling the pilot hole, apply a 90° or 60° countersink.



Countersink necessary

A countersink should be drilled to make the introduction of the deep hole drill easier.



Solid carbide or HSS countersink, green ring or blue ring.

4. Deep hole drilling

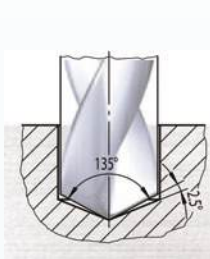
Safety instructions:

No deep hole drills $\geq 16 \times D$ may be operated with max. vc without pilot hole guidance.

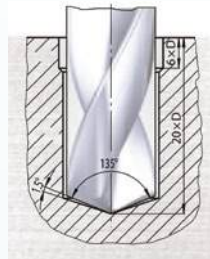
4. a Positioning

Vertical machining:

Introduce the deep hole drill with **anti-clockwise rotation** (optional) and reduced speed ($n = 300$ rpm) up to $0.5 \times D$ before the end of the pilot hole without through-coolant.



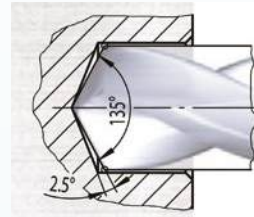
Deep hole drill up to $30 \times D$



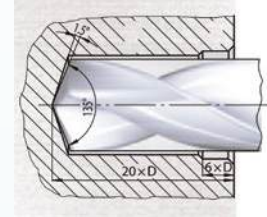
Deep hole drill $40/50 \times D$

Horizontal machining:

Introduce the deep hole drill with **anti-clockwise rotation** and reduced speed ($n = 300$ rpm) up to $0.5 \times D$ before the end of the pilot hole without through-coolant.



Deep hole drill up to $30 \times D$



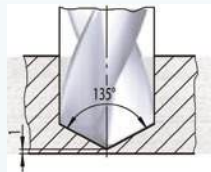
Deep hole drill $40/50 \times D$

4. b Drilling

Work without a drilling cycle (no chip evacuation necessary). **Switch on the through-coolant and smoothly increase the rotational speed** to the final working value v_c . When drilling a through hole, reduce the feed rate approx. 1 mm before the deep hole drill exits the material. In challenging operating conditions and long-chipping material, chip evacuation can increase process reliability. The retraction movement of the deep hole drill should be at pilot hole depth.

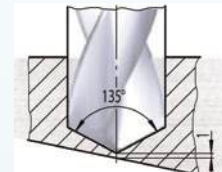
Straight material exiting:

Reduce feed rate to 50 %.



Exiting the material at an angle and breaking through into cross holes:

Reduce feed rate to 25 %.



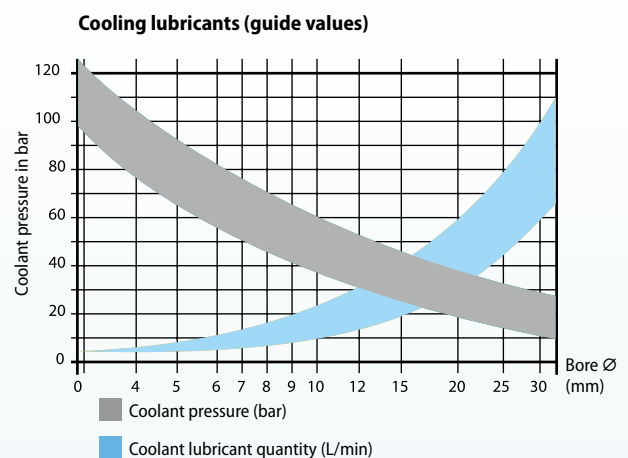
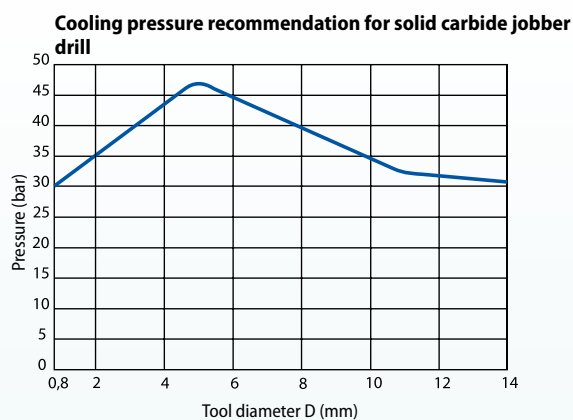
Special features of GARANT single-lip drills (No. 12 4002 – 12 4010)

Single-lip drills **can only be used up to a maximum of $50 \times D$ without support!** No reduction in the feed rate required when exiting the material, since the feed rate is always lower during use. **Back out** with reduced speed ($n = 100$ rpm or less) and reduced feed rate. The appropriate procedure prevents the single-lip drill from vibrating and thus increases the tool life.

4. c Backing out

Before backing out the deep hole drill, **switch off the through-coolant, smoothly reduce the rotational speed** ($n = 300$ rpm) and with **reduced rapid advance** ($v_f = 1000$ mm/min) back the drill out of the hole.

Note on cooling



Garant MASTER STEEL MICRO

(No. 12 1224 – 12 1231)

Ensure there is a coolant pressure of **at least 30 bar** and **sufficiently fine filtration** of the cooling agent ($D_c < \varnothing 2$ mm with filter ≤ 0.01 mm, $D_c < \varnothing 3$ mm with filter ≤ 0.02 mm).

Work in combination with internal and external cooling to flush chips out of the drilled hole.

Garant Single-lip drills

(No. 12 4002 – 12 4010)

Cooling is **absolutely essential** to ensure safe chip evacuation.

A **minimum pressure of 40 bar** should be maintained.

Higher pressure can stabilise the drill. Emulsion with high oil content (12%) or deep hole drilling oil recommended.



Garant Solid carbide HPC deep hole drill

Spiral fluted, with **6 guide chamfers** and internal cooling channels. New generation of high performance deep hole drills in the HPC range.

With 135° point angle and special **h7 cutting edge tolerance** for optimum generation of a deep hole.

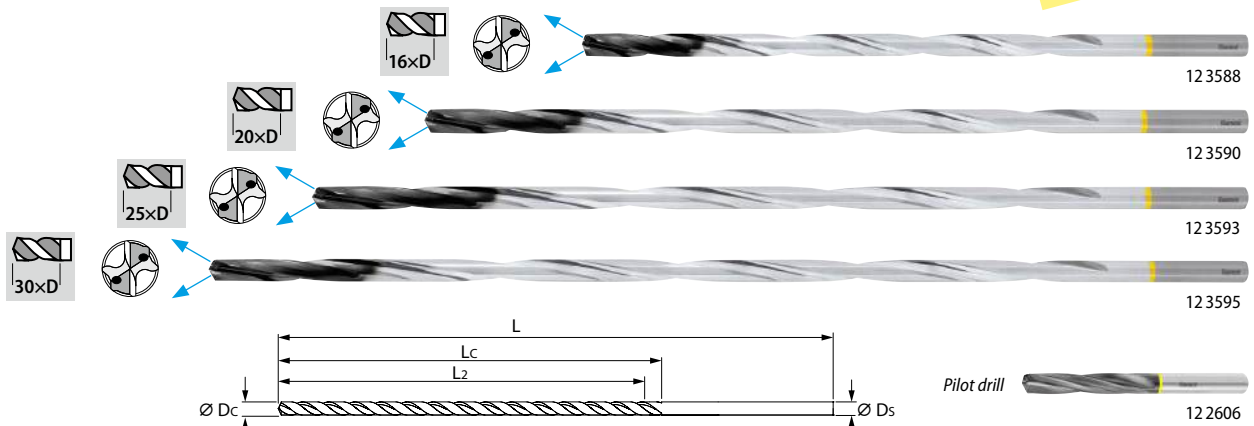
High roundness and alignment accuracy of the deep hole.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

For process reliability when using the 16xD deep hole drill, prior centring with No. 121068 – 121121 or 4xD pilot drilling operation with pilot drill No. 122606 is necessary. For deep holes greater than 20xD, a pilot hole with maximum drilling depth with pilot drill No. 122606 is absolutely essential. **The generation of a pilot hole improves process reliability.**

See also page
144/145



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	Cu	CuZn	GRP	CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
12 3588	160	190	140	150			120			90		80	70	80	90	115	80	80					
12 3590	150	180	130	135			105			80		70	65	70	90	100	70	70					
12 3593	130	160	120	120			95			70		65	55	65	75	90	65	65					
12 3595	120	150	110	120			95			70		65	55	65	70	80	65	65					

Ø D _c h7	12 3588	12 3590	12 3593	12 3595	L ₂				L				Ø D _s	Alu	f
	Solid carbide HPC deep hole drill plain shank				12 3588	12 3590	12 3593	12 3595	12 3588	12 3590	12 3593	12 3595		12 3588	12 3595
	DIN 6535 HA 16xD	DIN 6535 HA 20xD	DIN 6535 HA 25xD	DIN 6535 HA 30xD	12 3588	12 3590	12 3593	12 3595	12 3588	12 3590	12 3593	12 3595		12 3588	12 3595
mm	DLC	DLC	DLC	DLC	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm/rev.	mm/rev.
2	eShop	eShop	eShop	eShop	39	47	57	67	84	92	104	115	4	0.1	0.08
2,2	eShop	eShop	eShop	eShop	38.7	46.7	56.7	66.7	84	92	104	115	4	0.14	0.11
2,3	eShop	eShop	eShop	eShop	38.6	46.6	56.6	66.6	84	92	104	115	4	0.14	0.11
2,4	(eShop)	eShop	eShop	(eShop)	50.4	66.4	76.4	86.4	96	112	125	138	4	0.14	0.11
2,5	eShop	eShop	eShop	eShop	50.3	66.3	76.3	86.3	96	112	125	138	4	0.14	0.11
2,7	eShop	eShop	(eShop)	eShop	50	66	76	86	96	112	125	138	4	0.14	0.11
2,8	eShop	eShop	eShop	eShop	49.8	65.8	75.8	85.8	96	112	125	138	4	0.14	0.11
3	eShop	eShop	eShop	eShop	55.5	75.5	93.5	100.5	100	120	135	150	6	0.14	0.11
3,2	eShop	eShop	eShop	eShop	55.2	75.2	93.2	100.2	100	120	135	150	6	0.18	0.15
3,3	eShop	eShop	eShop	eShop	55.1	75.1	105.1	130.1	100	120	150	185	6	0.18	0.15
3,5	eShop	eShop	eShop	eShop	54.8	74.8	104.8	129.8	100	120	150	185	6	0.18	0.15
3,8	eShop	eShop	eShop	eShop	69.3	84.3	114.3	129.3	115	130	160	185	6	0.18	0.15
4	eShop	eShop	eShop	eShop	69	84	114	129	115	130	160	185	6	0.18	0.15
4,2	eShop	eShop	eShop	eShop	68.7	103.7	113.7	128.7	115	160	160	185	6	0.22	0.19
4,5	eShop	eShop	eShop	eShop	83.3	103.3	128.3	158.3	130	160	180	215	6	0.22	0.19
4,7	eShop	eShop	eShop	eShop	82.9	112.9	127.9	157.9	130	160	180	215	6	0.22	0.19
4,8	eShop	eShop	eShop	eShop	82.8	112.8	127.8	157.8	130	160	180	215	6	0.22	0.19
5	eShop	eShop	eShop	eShop	82.5	112.5	127.5	157.5	130	160	180	215	6	0.22	0.19
5,5	eShop	eShop	eShop	eShop	99.8	131.8	159.8	171.8	150	185	205	230	6	0.25	0.22
5,8	eShop	eShop	(eShop)	(eShop)	99.3	131.3	159.3	171.3	150	185	205	230	6	0.25	0.22
6	eShop	eShop	eShop	eShop	99	131	159	171	150	185	205	230	6	0.25	0.22
6,5	eShop	eShop	eShop	eShop	115.3	150.3	190.3	205.3	165	210	240	280	8	0.28	0.26
6,8	eShop	eShop	(eShop)	eShop	114.8	149.8	189.8	219.8	165	210	240	280	8	0.28	0.26
7	eShop	eShop	eShop	eShop	114.5	149.5	189.5	219.5	165	210	240	280	8	0.28	0.26
7,5	eShop	eShop	eShop	eShop	128.8	168.8	208.8	218.8	180	230	260	280	8	0.28	0.26
7,8	eShop	eShop	eShop	eShop	128.3	168.3	208.3	253.3	180	230	260	315	8	0.28	0.26
8	eShop	eShop	eShop	eShop	128	168	208	253	180	230	260	315	8	0.28	0.26
8,5	eShop	eShop	eShop	eShop	147.3	182.3	227.3	282.3	205	260	285	350	10	0.33	0.3
8,8	eShop	eShop	eShop	eShop	146.8	181.8	226.8	281.8	205	260	285	350	10	0.33	0.3
9	eShop	eShop	eShop	eShop	146.5	181.5	226.5	281.5	205	260	285	350	10	0.33	0.3
9,8	eShop	eShop	(eShop)	(eShop)	165.3	215.3	253.3	315.3	225	290	310	380	10	0.33	0.3
10	eShop	eShop	eShop	eShop	165	215	253	315	225	290	310	380	10	0.33	0.3
10,2	eShop	eShop	eShop	eShop	174.7	252.7	309.7	364.7	240	315	375	430	12	0.37	0.34
10,8	eShop	eShop	(eShop)	eShop	173.8	251.8	308.8	363.8	240	315	375	430	12	0.37	0.34
11,8	eShop	eShop	eShop	eShop	197.3	250.3	307.3	362.3	265	315	375	430	12	0.37	0.34
12	eShop	eShop	eShop	eShop	197	250	307	362	265	315	375	430	12	0.37	0.34



Garant Solid carbide HPC deep hole drill

Spiral fluted, with **4 guide chamfers** and internal cooling channels. New generation of high performance deep hole drills in the HPC range.

With 135° point angle and special **h7 cutting edge tolerance** for optimum generation of a deep hole.

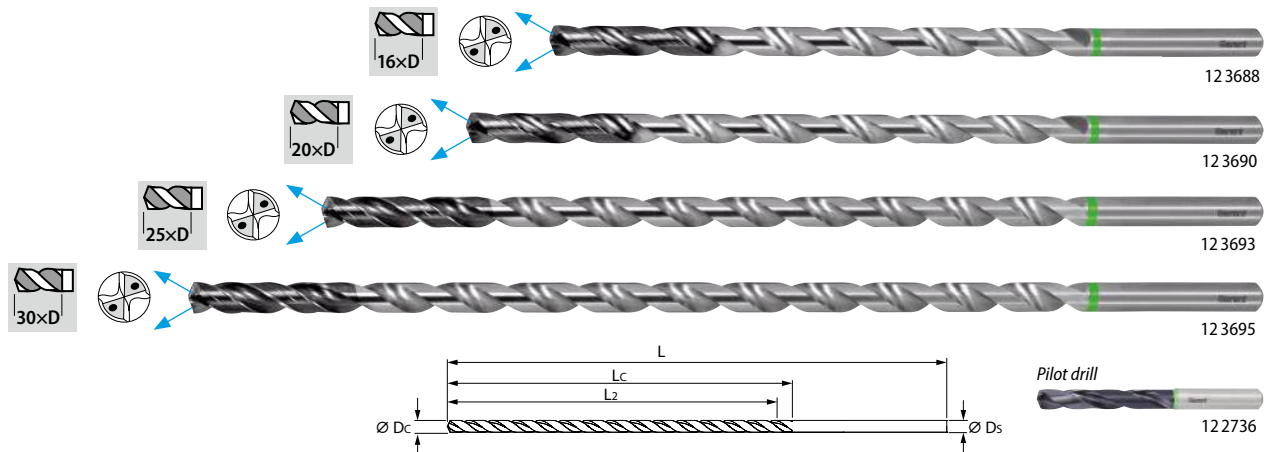
High roundness and alignment accuracy of the deep hole.

Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

For process reliability when using the 16xD deep hole drill, an initial centre drilling with No. 121068 – 121121 or 4xD pilot drilling operation with pilot drill No. 122736 is necessary. For deep holes greater than 20xD, a pilot hole to the maximum drilling depth with pilot drill No. 122736 is absolutely essential. **The generation of a pilot hole improves process reliability.**

See also
page 144/145.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
12 3688				110	95	95	95	75						55	50		100	●	●	●	●	●	●
12 3690				105	90	90	90	70						50	45		95	●	●	●	●	●	●
12 3693				95	80	80	80	65						50	45		85	●	●	●	●	●	●
12 3695				90	75	75	75	60						45	40		80	●	●	●	●	●	●

Ø D _c h7	12 3688	12 3690	12 3693	12 3695	L ₂				L				Ø D _s	f
	Solid carbide HPC deep hole drill plain shank				12 3688	12 3690	12 3693	12 3695	12 3688	12 3690	12 3693	12 3695		
mm	DIN 6535 HA 16xD TiAlN	DIN 6535 HA 20xD TiAlN	DIN 6535 HA 25xD TiAlN	DIN 6535 HA 30xD TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm/rev.
2	eShop	eShop	eShop	eShop	39	47	57	67	84	92	104	115	4	0.05
2,2	eShop	eShop	eShop	eShop	38.7	46.7	56.7	66.7	84	92	104	115	4	0.06
2,3	eShop	eShop	(eShop)	eShop	38.6	46.6	56.6	66.6	84	92	104	115	4	0.06
2,4	eShop	eShop	eShop	eShop	50.4	66.4	76.4	86.4	96	112	125	138	4	0.06
2,5	eShop	eShop	eShop	eShop	50.3	66.3	76.3	86.3	96	112	125	138	4	0.06
2,7	eShop	eShop	eShop	eShop	50	66	76	86	96	112	125	138	4	0.06
2,8	eShop	eShop	eShop	eShop	49.8	65.8	75.8	85.8	96	112	125	138	4	0.06
3	eShop	eShop	eShop	eShop	55.5	75.5	93.5	100.5	100	120	135	150	6	0.06
3,2	eShop	eShop	—	—	55.2	75.2	—	—	100	120	—	—	6	0.08
3,3	eShop	eShop	eShop	eShop	55.1	75.1	105.1	130.1	100	120	150	185	6	0.08
3,5	eShop	eShop	eShop	eShop	54.8	74.8	104.8	129.8	100	120	150	185	6	0.08
3,8	eShop	eShop	—	—	69.3	84.3	—	—	115	130	—	—	6	0.08
4	eShop	eShop	eShop	eShop	69	84	114	129	115	130	160	185	6	0.08
4,2	eShop	eShop	—	—	68.7	103.7	—	—	115	160	—	—	6	0.1
4,5	eShop	eShop	—	—	83.3	103.3	—	—	130	160	—	—	6	0.1
5	eShop	eShop	eShop	eShop	82.5	112.5	127.5	157.5	130	160	180	215	6	0.1
5,5	eShop	eShop	—	—	99.8	131.8	—	—	150	185	—	—	6	0.12
6	eShop	eShop	eShop	eShop	99	131	159	171	150	185	205	230	6	0.12
6,5	eShop	eShop	—	—	115.3	150.3	—	—	165	210	—	—	8	0.14
6,8	eShop	eShop	—	—	114.8	149.8	—	—	165	210	—	—	8	0.14
7	eShop	eShop	eShop	eShop	114.5	149.5	189.5	219.5	165	210	240	280	8	0.14
8	eShop	eShop	eShop	eShop	128	168	208	253	180	230	260	315	8	0.14
8,5	eShop	eShop	eShop	eShop	147.3	182.3	227.3	282.3	205	260	285	350	10	0.16
9	eShop	eShop	eShop	eShop	146.5	216.5	254.5	316.5	205	290	310	380	10	0.16
10	eShop	eShop	eShop	eShop	165	215	253	315	225	290	310	380	10	0.16
12	eShop	eShop	eShop	eShop	197	250	307	362	265	315	375	430	12	0.18



Garant Solid carbide HPC deep hole drill

12 3691 – Helical fluted, with **4 guide chamfers** and internal coolant holes. New generation of high performance co-pilot drills in the HPC range.

With 138° point angle and special **j6 cutting edge tolerance** for optimum generation of a co-pilot hole.

High roundness and alignment accuracy of the co-pilot hole.

12 3740/3750 – Spiral fluted, with **4 guide chamfers** and internal cooling channels. New generation of high performance deep hole drills in the HPC range.

With 135° point angle and special **fg6 cutting edge tolerance** for optimum generation of deep holes.

High roundness and alignment accuracy of the deep hole.

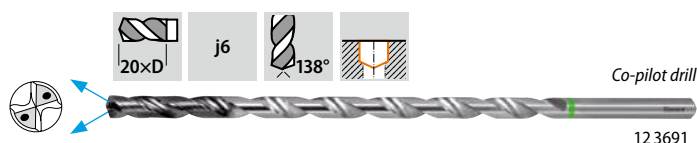
Note:

Flute length $L_c = L_2 + 1.5 \times D_c$.

To achieve good process reliability with 40xD and 50xD deep hole drills it is absolutely essential to drill a pilot hole with maximum drilling depth with drill No. 122736 and a 20xD co-pilot hole with a co-pilot drill No. 123691.

The generation of a pilot hole improves process reliability.

See also
page 144/145.



Co-pilot drill

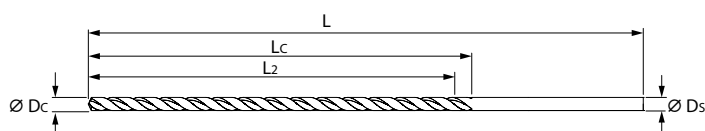
12 3691



12 3740



12 3750



Pilot drill

12 2736

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si												INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K						
12 3691				105	90	90	90	70							50	45		95	●		●			
12 3740				75	60	60	60	50							40	35		65	●		●			
12 3750				65	50	50	50	45							35	30		55	●		●			

Ø D _c	12 3691	12 3740	12 3750	L ₂			L			Ø D _s	
	Solid carbide HPC co-pilot drill, plain shank	Solid carbide HPC deep hole drill plain shank		12 3691	12 3740	12 3750	12 3691	12 3740	12 3750		f
	DIN 6535 HA 20xD	DIN 6535 HA 40xD	DIN 6535 HA 50xD								
mm	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm/rev.
3	eShop	eShop	eShop	75.5	145.5	170.5	120	195	220	6	0.05
4	eShop	eShop	eShop	84	169	214	130	220	265	6	0.06
4,2	eShop	eShop	eShop	103.7	193.7	238.7	160	245	290	6	0.08
4,5	eShop	eShop	eShop	103.3	193.3	238.3	160	245	290	6	0.08
4,8	eShop	eShop	eShop	112.8	222.8	267.8	160	275	320	6	0.08
5	eShop	eShop	eShop	112.5	222.5	267.5	160	275	320	6	0.08
5,5	eShop	eShop	eShop	131.8	251.8	301.8	185	305	355	6	0.1
5,8	eShop	eShop	eShop	131.3	251.3	306.3	185	305	355	6	0.1
6	eShop	eShop	eShop	131	251	306	185	305	355	6	0.1
6,5	eShop	eShop	eShop	150.3	290.3	340.3	210	345	395	8	0.1
6,8	eShop	eShop	eShop	149.8	289.8	369.8	210	345	425	8	0.12
7	eShop	eShop	–	149.5	289.5	–	210	345	–	8	0.12
7,5	eShop	eShop	–	168.8	328.8	–	230	385	–	8	0.12
7,8	eShop	eShop	–	168.3	328.3	–	230	385	–	8	0.12
8	eShop	eShop	–	168	328	–	230	385	–	8	0.12
8,5	eShop	eShop	–	182.3	367.3	–	260	430	–	10	0.14
8,8	eShop	eShop	–	216.8	366.8	–	290	430	–	10	0.14
9	eShop	eShop	–	216.5	366.5	–	290	430	–	10	0.14



Garant GARANT Master Steel Deep solid carbide deep hole drill and pilot drill

Excellent chip evacuation due to the unequal helical pitch of the flutes, guide rings and additional guide chamfers for very high precision when drilling.

Maximum process reliability due to exactly matching tools within the overall system. Drilling up to the maximum depth without a pilot drill.

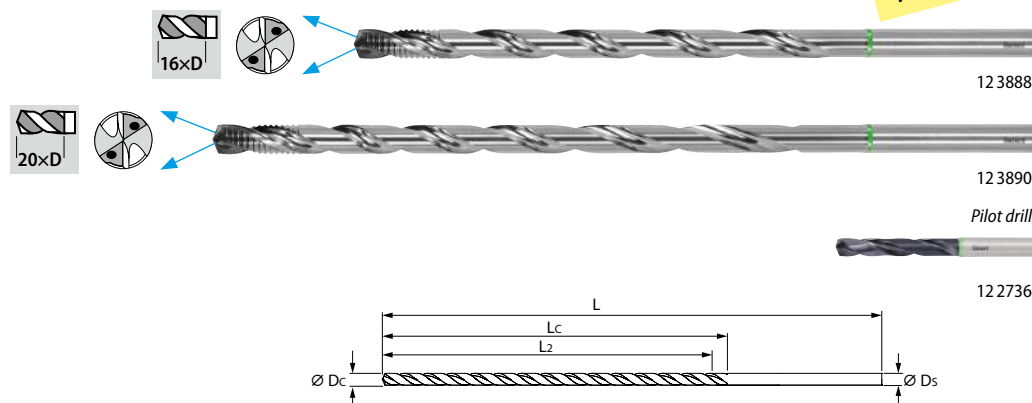
Significantly increased tool stability due to the substantially strengthened core.

Increased metal removal rates and **outstanding tool lives** lead to an economical high-end drilling process.

Note:

Flute length $L_r = L_2 + 1.5 \times D_c$.

For process reliability when using the 16xD deep-hole drill, initial centre drilling with No. 121068 – 121121 or a pilot hole of at least 4xD with pilot drill No. 122736 is necessary. For deep holes greater than 20xD, a pilot hole to the maximum drilling depth with pilot drill No. 122736 is absolutely essential. The generation of a pilot hole improves process reliability. **The specified L/D ratio gives the minimum achievable depth of hole with the respective deep-hole drill.**



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10% Si										INOX	INOX	Ti	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
12 3888				125	115	110	110	90					65	60	30	115	●	●	●	○			
12 3890				120	110	105	105	85					65	60	25	110	110	●	●	○			

mm	Ø D _c j6		L ₂		L		Ø D _s		 f
	TOE	12 3888	TOE	12 3890					
	GARANT Master Steel Deep solid carbide deep hole drill, plain shank								
	DIN 6535 HA 16×D	DIN 6535 HA 20×D	12 3888	12 3890	12 3888	12 3890			
	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm/rev.	
3	eShop	eShop	55.5	67.5	103	115	6	0.07	
3,2	eShop	eShop	55.2	67.2	103	115	6	0.09	
3,3	eShop	eShop	60.1	74.1	108	122	6	0.09	
3,5	eShop	eShop	59.8	73.8	108	122	6	0.09	
3,8	eShop	eShop	65.3	80.3	114	129	6	0.09	
4	eShop	eShop	70	87	118	135	6	0.09	
4,2	eShop	eShop	77.7	95.7	126	144	6	0.11	
4,3	eShop	eShop	77.6	95.6	126	144	6	0.11	
4,5	eShop	eShop	77.3	95.3	126	144	6	0.11	
4,8	eShop	eShop	85.8	105.8	135	155	6	0.11	
5	eShop	eShop	85.5	105.5	135	155	6	0.11	
5,5	eShop	eShop	97.8	119.8	147	169	6	0.14	
5,8	eShop	eShop	102.3	126.3	151	175	6	0.14	
6	eShop	eShop	102	126	151	175	6	0.14	
6,5	eShop	eShop	110.3	136.3	162	188	8	0.16	
6,8	eShop	eShop	119.8	147.8	172	200	8	0.16	
7	eShop	eShop	119.5	147.5	172	200	8	0.16	
7,5	eShop	eShop	127.8	157.8	180	210	8	0.16	
7,8	eShop	eShop	136.3	168.3	188	220	8	0.16	
8	eShop	eShop	136	168	188	220	8	0.16	
8,5	eShop	eShop	144.3	178.3	203	237	10	0.19	
8,8	eShop	eShop	153.8	189.8	213	249	10	0.19	
9	eShop	eShop	153.5	189.5	213	249	10	0.19	
9,8	eShop	eShop	170.3	210.3	229	269	10	0.19	
10	eShop	eShop	170	210	229	269	10	0.19	
10,2	eShop	eShop	178.7	220.7	245	287	12	0.21	
10,5	eShop	eShop	178.3	220.3	245	287	12	0.21	
10,8	eShop	eShop	186.8	230.8	254	298	12	0.21	
11	eShop	eShop	186.5	230.5	254	298	12	0.21	
11,8	eShop	eShop	204.3	252.3	271	319	12	0.21	
12	eShop	eShop	204	252	271	319	12	0.21	
13	eShop	eShop	220.5	272.5	291	343	14	0.24	
14	eShop	eShop	238	294	308	364	14	0.24	



Garant GARANT Master Steel Deep solid carbide deep hole drill

Excellent chip evacuation due to the unequal helical pitch of the flutes, guide rings and additional flute lands for very high precision when drilling.

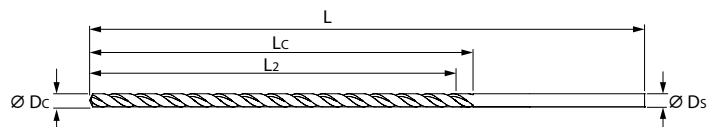
Maximum process reliability due to exactly matching tools within the overall system. Drilling up to the maximum depth without a pilot drill.

Significantly increased tool stability due to the substantially strengthened core.

Increased metal removal rates and outstanding tool lives lead to an economical high-end drilling process.

Note: Flute length $L_c = L_2 + 1.5 \times D_c$. For deep holes greater than $20 \times D$, a pilot hole to the maximum drilling depth with pilot drill No. 122736 is absolutely essential. The generation of a pilot hole improves process reliability. **The specified L/D ratio gives the minimum achievable depth of hole with the respective deep hole drill.**

See also
page 144/145.



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10% Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	K					
12 3893				110	100	95	95	75						60	55		100						
12 3895				105	95	85	85	70						55	50		95						

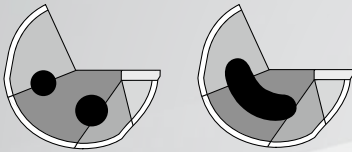
$\varnothing D_c$ j6	10E 12 3893	10E 12 3895	L_2		L		$\varnothing D_s$	
	GARANT Master Steel Deep solid carbide deep hole drill, plain shank		12 3893	12 3895	12 3893	12 3895		f
	DIN 6535 HA 25xD	DIN 6535 HA 30xD						
	TiAlN	TiAlN						
mm			mm	mm	mm	mm	mm	mm/rev.
3	eShop	eShop	83.5	99.5	131	147	6	0.07
3,2	eShop	eShop	83.2	99.2	131	147	6	0.07
3,3	eShop	eShop	92.05	109.05	140	157	6	0.09
3,5	eShop	eShop	91.75	108.75	140	157	6	0.09
3,8	eShop	eShop	99.3	118.3	148	167	6	0.09
4	eShop	eShop	107	128	155	176	6	0.09
4,2	eShop	eShop	117.7	140.7	166	189	6	0.11
4,5	eShop	eShop	117.3	140.3	166	189	6	0.11
4,8	eShop	eShop	130.8	155.8	180	205	6	0.11
5	eShop	eShop	130.5	155.5	180	205	6	0.11
5,5	eShop	eShop	148.8	176.8	198	226	6	0.14
6	eShop	eShop	156	186	205	235	6	0.14
6,5	eShop	eShop	169.3	201.3	221	253	8	0.16
6,8	eShop	eShop	182.8	217.8	235	270	8	0.16
7	eShop	eShop	182.5	217.5	235	270	8	0.16
8	eShop	eShop	208	248	260	300	8	0.16
8,5	eShop	eShop	221.25	263.25	280	322	10	0.19
9	eShop	eShop	234.5	279.5	294	339	10	0.19
10	eShop	eShop	260	310	319	369	10	0.19
10,8	eShop	eShop	285.8	340.8	353	408	12	0.21
11	eShop	eShop	285.5	340.5	353	408	12	0.21
11,8	eShop	eShop	312.3	372.3	379	439	12	0.21
12	eShop	eShop	312	372	379	439	12	0.21
13	eShop	eShop	337.5	402.5	408	473	14	0.24
14	eShop	eShop	364	434	434	504	14	0.24

Garant**SINGLE-LIP DRILLS**

**Ideal for small and medium series.
Reliable, cost-effective and universal.**

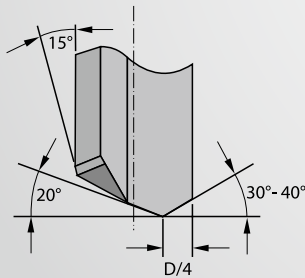
Cooling channel bore

For drill diameters < 7.7 mm, a kidney-shaped cooling channel bore ensures maximum coolant throughput for optimum cooling of the tool and component and for reliable chip evacuation from the bore.

**General-purpose use**

Due to the universal circumferential shape and special tip geometry on the drill head, close bore tolerances and a small drilling path can be achieved in virtually all suitable materials.

The tools can be used without problems on machining centres up to a drilling depth of $50 \times D$.

**Long tool life**

Soldered solid carbide drill head, with high-performance coating for maximum tool life.

Diameter up to 50 mm and overall lengths up to 6000 mm available on request.

**12****Steel shank**

Tempered steel tube with internal coolant channel and V-shaped groove (bead) for reliable chip evacuation.

Fixed soldered connection

Soldered sleeve for clamping in arbor

Intermediate dimensions

If the respective blank is available, delivery time of approx. 3 weeks for intermediate sizes.

Note

For machining stainless steels, we recommend single-lip drills with chip breaker. These are available on request.





GARANT Master Steel Feed solid carbide stepped drill, for tapping holes with 90° countersink

For generation of **optimum tapping holes**.

Creates **ideal machining conditions** for the subsequent tapping tool.

The cutter Ø of the drill is matched to the thread that is to be produced, in order to achieve a threads true to gauge and for **high process reliability of the tapping process.**

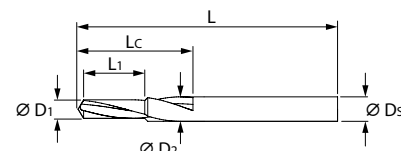
The 90° countersink for the thread is produced **in the same operation** as drilling the tapping hole.

3-flute drill, specially developed for **use at very high feed rates.**

Outstandingly suitable for machines with high installed power and stable machining conditions.

Drill tolerance ($\varnothing D_1$): m7.

First level tolerance ($\varnothing D_3$): h7.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si											INOX	INOX	Ti	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	K						
	12 5035			160	140	130	110	90	60	60	60	60	60	40	50	40	130	80						

for threads	1/E	12 5035	Ø D ₁	Ø D ₂ h7	L ₁	L _c	L	Ø D ₃	
	GARANT Master Steel Feed solid carbide stepped drill								
	TiAlN								
			mm	mm	mm	mm	mm	mm	f mm/rev.
M5		eShop	4.25	5.5	13.6	28	66	6	0.28
M6		eShop	5.1	6.6	16.5	41	79	8	0.32
M8		eShop	6.85	8.8	21	47	89	10	0.37
M8×1		eShop	7.1	8.8	21	47	89	10	0.37
M10		eShop	8.6	11	25.5	55	102	12	0.44
M10×1		eShop	9.1	11	25.5	55	102	12	0.44
M12		eShop	10.35	13.2	30	60	107	14	0.5
M16		eShop	14.15	17.6	38.5	73	123	18	0.56



GARANT Master Steel Feed solid carbide stepped drill, non-standard sizes, with 90° countersink

Stepped drill, finish ground to your specifications.

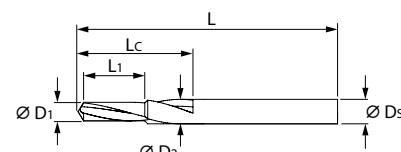
For producing a drilled hole and 90° countersink in a single operation.

3-flute drill, specially developed for **use at very high feed rates.**

Outstandingly suitable for machines with high installed power and stable machining conditions.

Drill tolerance (nominal $\varnothing$): m7.

First level tolerance (nominal $\varnothing D_2$): h7.



Note: Nominal Ø and step length are configurable (freely selectable within the range stated in the table) and ground to specification.

Suitable for/ v _c [m/min]	Alu plastics 	Alu Alu cast > 10 % Si 										INOX	INOX	Ti	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	K					
17 5040–17 5044				160	140	130	110	90	60	60	60	60	60	50	40	130	80					

Nominal Ø range from - to	11E 12 5040	11E 12 5041	11E 12 5042	11E 12 5043	11E 12 5044	Ø D ₂ h7	L ₁ min - max	L _c	L	Ø D _s	 < 1100 N f
	GARANT Master Steel Feed solid carbide stepped drill, configurable										
	from a quantity of 3 pieces	from a quantity of 5 pieces	from a quantity of 10 pieces	from a quantity of 15 pieces	from a quantity of 20 pieces						
mm	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm/rev.
3,98-4,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	5	4.5 – 15.4	28	66	6	0.28
4,51-5,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	6	5.5 – 15.4	28	66	6	0.28
5,51-6,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	7	6.5 – 22.55	41	79	8	0.32
6,51-7,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	8	7.5 – 22.55	41	79	8	0.37
7,51-8,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	9	8.5 – 25.85	47	89	10	0.37
8,51-9,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	10	9.5 – 25.85	47	89	10	0.44
9,51-11,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	12	11.5 – 30.25	55	102	12	0.44
11,51-13,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	14	13.5 – 33	60	107	14	0.5
13,51-15,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	16	15.5 – 33.75	65	115	16	0.56
15,51-17,5	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	18	17.5 – 40.15	73	123	18	0.61



Garant Solid carbide short stepped drill for tapping holes, 90° countersink

Very sturdy – step length to DIN 8378.

Tight concentricity tolerances between drill and counterbore Ø guarantee exact alignment.

Application: Particularly suitable for NC machines and automatic machines.

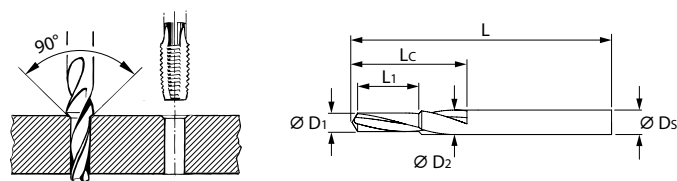
For drilling tapping holes to DIN 336 sheet 1 with 90° countersinking.

In the following operation, the tap therefore does not have to cut into the sharp edge of the hole.

Sizes **F**: Tapping holes for the following **fluteless taps**.



12 5050



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	P	P	P	P	P	P	P	P	INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	P	P	P	H	H	H	H	M	M	S	K	N		
12 5050	260	180	180	90	90	90	60	35							35	30	25	110	180	●	●	○

for threads	12 5050	Ø D ₁ h8	Ø D ₂ h8	L ₁	L _c	L	Ø D ₅	f
	Solid carbide short stepped drill							
	90° TiAlN	mm	mm	mm	mm	mm	mm	mm/rev.
M2F	eShop	1.8	2.5	5.3	20	62	6	0.05
M2,5F	eShop	2.3	3	6.8	20	62	6	0.05
M3	eShop	2.5	3.4	8.8	20	62	6	0.08
M3F	eShop	2.8	3.4	8.8	20	62	6	0.08
M3,5F	eShop	3.25	4	9.6	24	66	6	0.08
M4	eShop	3.3	4.5	11.4	24	66	6	0.08
M4F	eShop	3.7	4.5	11.4	24	66	6	0.08
M5	eShop	4.2	5.5	13.6	28	66	6	0.08
M5F	eShop	4.65	5.5	13.6	28	66	6	0.08
M6	eShop	5	6.6	16.5	34	79	8	0.11
M6F	eShop	5.55	6.6	16.5	34	79	8	0.11
M8	eShop	6.8	9	21	47	89	10	0.11
M8F	eShop	7.45	9	21	47	89	10	0.11
M10	eShop	8.5	11	25.5	55	102	12	0.14
M10F	eShop	9.35	11	25.5	55	102	12	0.14
M12	eShop	10.2	13.5	30	60	107	14	0.18
M12F	eShop	11.2	13.5	30	60	107	14	0.18
M14	eShop	12	16	34.5	65	115	16	0.18
M16	eShop	14	18	38.5	73	123	18	0.18
M16F	eShop	15.1	18	38.5	73	123	18	0.18



Garant Solid carbide stepped drill for tapping holes, 90° countersink

Drill and counterbore each with its own chip flutes and guide chamfers.

This special design permits frequent regrinding without losing the stepped drill profile.

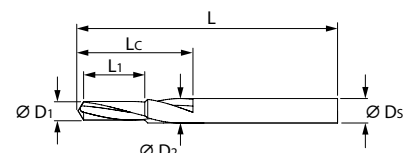
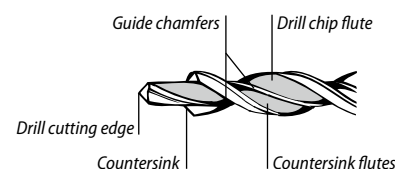
Countersink angle 90°.

Advantage: Precisely aligned **tapping drill hole and countersink** produced in a single operation.

For tapping drill holes.



125100



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10% Si 										INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	K	N	●	●	●	○	○
12 5100	260	180	180	90	90	90	60	35					35	30	25	110	180					

for threads	11E	12 5100	Ø D ₁ h7	Ø D ₂ h7	L ₁	L _c	L	Ø D _s	 < 1100 N f
		Solid carbide stepped drill for tapping holes 90° TiAlN							
			mm	mm	mm	mm	mm	mm	mm/rev.
M3		eShop	2.5	6	8.8	28	66	6	0.08
M4		eShop	3.3	6	11.4	28	66	6	0.08
M5		eShop	4.2	6	13.6	28	66	6	0.08
M6		eShop	5	8	16.5	41	79	8	0.11
M8		eShop	6.8	10	21	47	89	10	0.11
M10		eShop	8.5	12	25.5	55	102	12	0.14
M12		eShop	10.2	14	30	60	107	14	0.18



Garant Solid carbide short stepped drill for through holes, 180° (for socket-head screws)

Very sturdy— step length to DIN 8376.

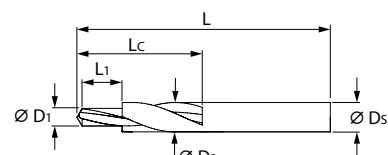
Tight concentricity tolerances between drill and counterbore Ø guarantee exact alignment.

Application: For screw through holes to DIN-ISO 273 and counterbores to DIN 74, sheet 2 form H, J, and K, medium version.

For screws to DIN 912, 6912, and 7984, ISO 1207 (DIN 84).



125120



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si 										INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
12.5120	260	180	180	90	90	90	60	35					35	30	25	110	180	●	●			○	

for screws	11E	12 5120	$\varnothing D_1$ h8	$\varnothing D_2$ h8	L_1	L_c	L	$\varnothing D_s$	 < 1100 N f
	Solid carbide short stepped drill								
	180°								
	TiAlN		mm	mm	mm	mm	mm	mm	mm/rev.
M3		eShop	3.4	6	9	28	64	6	0.08
M4		eShop	4.5	8	11	37	79	8	0.08
M5		eShop	5.5	10	13	43	89	10	0.08
M6		eShop	6.6	11	15	55	102	12	0.11
M8		eShop	9	15	19	65	115	16	0.11
M10		eShop	11	18	23	62	123	18	0.14

							
Type >	NC spotting drill		Indexable drill				
Brand >	Garant	Garant	HOLEX	SCAR	Garant	Garant	HOLEX
Article number	231500 – 231502	231600 – 231620	232240 – 232275	231702 – 231720	232298 – 232310	234000 – 234025	235000 – 235010
Shank	HA / HB	HB (ISO 9766)	HB / MT	HB (ISO 9766)	Combi	HB (ISO 9766)/ABS	HB (ISO 9766)
Version/length	90° / 120° / 142°	1.5 / 3 / 5 / 8 / 10 / 12xD	1.5 / 3 / 5 / 8 / 12xD	1.5 / 3 / 5 / 8 / 12xD	2 / 3 / 4xD	2 / 3 / 4 / 5xD	2 / 3 / 4xD
Size range	10 – 20	9 – 36	12 – 65	6 – 32	14 – 44	14 – 44	14 – 40
Page(s)	158	159 / 160	163	167 – 168	171	173 / 174	176
Suitable Insert							
Insert type / ISO	SOGT	Interchangeable head	HSS/HSS-E-PM insert	Interchangeable head	WOEX	SOGX	SOMT XOMT
Article number	231515 – 231528	231630 – 231690	232282 – 232286	231740 – 231790	232400 – 232780	234030 – 234098	235030 – 235082
		●	●	●	○	●	●
		○	○	○	●	●	●
		●	●●	●●		●	●
					●	○	○

				
Type >	Indexable drill			Core drill
Brand >	KOMET	KOMET	KOMET	Garant
	KUB Pentron®	KUB Trigon®	KUB Centron®	Twin-cutter drilling head
Article number	236601 – 236615	236630 – 236635	236650 – 236654	237609 – 237610
Shank	HB (ISO 9766) / ABS	Combi / ABS	ABS	ER / HW
Version/length	2 / 3 / 4 / 5xD	3xD	4 / 6 / 8xD	
Size range	14 – 46	14 – 44	20 – 81	23.5 – 153
Page(s)	180 – 182	184	185 / 186	189
Suitable Insert				
Insert type / ISO	SOGX	WOEX	WOEX	CC..
Article number	236605 – 236610	236740 – 236780	236740 – 236780	Catalogue part 26
	●	●	○	●●
	●	●	○	●●
	●			○
	○	●		●

						
Type >	Fine boring		Arbors	Precision boring tools		Arbors
Brand >	Garant	Garant	Garant	KOMET	KOMET	Garant
	Micro-system	Precision boring System	Reducers, Extensions	B301 / M302 M03 speed	MicroKom® hi.flex / BluFlex 2	Reducers, Extensions
Article number	237490 – 237498	237501 – 237573	237626 – 237672	238301 – 238374	238380 – 238395	238420 – 238780
Shank	cylindrical	ER / HW / Mono	SK / HSK / BT	ABS	ABS	SK / HSK / ABS
Size range	0.3 – 19.1	9.75 – 320		24.8 – 206	6 – 365	
Page(s)	190	191 – 195	196	197 / 198	199	200 / 201
Suitable Insert						
Insert type / ISO	Cutter insert	CC..		TO.X	TOGX/WOHX	
Article number	237621 – 237625	237695 – 237698 Catalogue part 26		Available in the eShop	Available in the eShop	

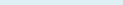
●● = particularly suitable; ● = suitable; ○ = suitable only under restricted conditions

Garant

Garant		P (Steel)					M (Inox)				K GG(G)				N (Alu)		S (Ti)		H (HRC)		
Grade description		P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	(Alu)	(Alu)	(Ti)	(Ti)	< 55	< 60	< 67
Carbide coated	Grade with very high wear resistance, for steel and very high wear resistance. CVD-TiCN- / Al ₂ O ₃ -TiN multi-layer coating.	HB6530																			
	Highly wear-resistant micrograin grade for high vc values. PVD-TiAlN / TiN coating.	HB6535					HB6535														
	Micrograin grade with extremely good edge stability, for use on stainless materials. PVD-TiAlN coating.						HB6640														
	For machining cast iron. CVD-TiC- / Al ₂ O ₃ coating										HB6715										
	Universally applicable wear-resistant and tough grade.	HB630					HB630				HB630										
	For machining non-ferrous metals. PVD-TiB2 coating.														HB6810						
	Machining of cast iron. CVD-TiCN- / Al ₂ O ₃ coating.										HB7305										
	Micro-grain carbide with 10% cobalt. AlTiSiN-PVD coating.		HB7530										HB7530								
	Highly wear-resistant micrograin grade for high vc values with CVD-TiCN- / Al ₂ O ₃ -TiN multi-layer coating.	HB7630																			
	Tough grade with 15% cobalt for machining steel. Particularly suitable for machining under unstable conditions. TiAlN coating.		HB3040									HB3040									
	Micro-grain carbide with 10% cobalt. PVD multi-layer coating. Also suitable for aluminium.									HB7630											
	Tough wear-resistant grade, general-purpose use. PVD-TiCN- / TiN coating.		HB7635					HB7635													
Carbide, uncoated	Grade for heavily interrupted cutting with PVD-TiAlN coating.		HB7640							HB7640							HB7640				
	Tool material grade for machining cast iron. Special TiAlSiN coating.										HB7725										
	Universal grade for wet and dry machining and high cutting speeds. AlCrN multi-layer coating.	HB225					HB225														
	With high wear-resistance, especially for stainless steels. PVD-TiAlN coating.	HB330					HB330														
	Machining of non-ferrous metals (aluminium).														HU7310						
	Polished uncoated carbide substrate for machining non-ferrous metals.														HU7810						

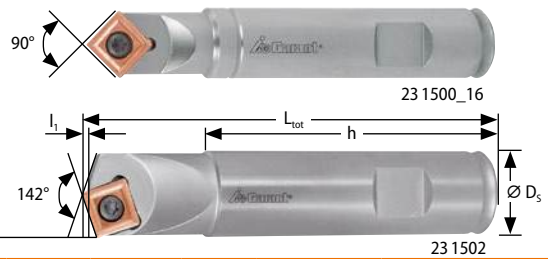
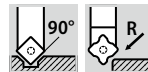
																
Carbide coated	PVD-TiAIN general-purpose tool material type															
		HBD30			HBD30			HBD30			HBD30					

KOMET															
Carbide coated	CVD-TiC-TiCN-TiN: Multi-layered coating on a P25M base substrate. TiN-Ti (C,N) - Al2O3-TiN: for W30 inserts. MT-TiCN - Al2O3-TiN: for W29 inserts. TiN-Ti (C,N) - Al2O3-TiN: for W30 inserts. MT-TiCN - Al2O3-TiN: for W29 inserts. CVC-TiCN-TiC-Al2O3-TiN: Long tool life even in the upper part of the cutting speed range. PVD-TiAlN / TiN / PVD-TiCN / TiN: General-purpose grade for enhanced wear resistance. PVD-TiAlN / TiN / PVD-TiCN / TiN: Suitable for machining tool steels and also stainless steels. Very tough wear-resistant grade. CVD-TiN-TiCN-Al₂O₃: For higher cutting speeds in cast iron materials. PVD-TiAlN: For heavily interrupted cutting. CVD-TiCN-TiN-Al2O3: Suitable for high cutting speeds. PVD-TiB2: For aluminium materials < 10% Si content. Combination of carbide and a high performance DBC coating. TiN-coated general-purpose grade for the best surface quality. Combination of carbide and a high performance DBC-P coating.														
		BK60			BK60										
		BK6425													
			BK6440												
		BK72													
		BK8425			BK8425					BK8425					
		BK8430			BK8430										
										BK62					
			BK7935		BK7935								BK7935		
		BK6115								BK6115					
													BK7710		
													DBC		
		TiN			TiN										
										DBG-P					
CERMET	Cermet high performance cutting material for high cutting speeds. Suitable for spheroidal graphite iron.														
		DST								DST					

											
Carbide coated	Wear-resistant grade. For heat-resistant alloys, austenitic, stainless steel, hard alloys, carbon steel with medium to high cutting speed.	IC908		IC908		IC908		IC908		IC908	

Garant NC spotting drill for indexable inserts No. 231515 – 231528

23 1500 Size 10 – **With plain shank.**
Size 16; 20 – **With Weldon shank.**



Ø D _s	2Y 23 1500	2Y 23 1501	2Y 23 1502	Number of cutting edges Z	maximum hole Ø d ₁		maximum drilling depth l ₁		Shank length h	L _{tot}	Indexable insert size	Insert screw
mm	90°	120°	142°		23 1500 23 1501	23 1502	23 1500 23 1501	23 1502				
10	eShop	–	–	1	10	–	4	–	–	90	10; 10G	231540 TX8 (2.0 Nm)
16	eShop	–	–	1	15	–	7	–	70	100	16	231540 TX15 (2.5 Nm)
20	–	eShop	eShop	1	17	18.5	5	3	70	100	16	231540 TX15 (2.5 Nm)

Garant Indexable inserts for NC spotting drills No. 231500 - 231502

Application:

Size 16 – For NC spot drilling and chamfering. Also suitable for stationary use for face turning on the lathe. **Suitable for engraving.**

23 1521 Size 10 – For NC spot drilling and chamfering. Also suitable for stationary use for face turning on the lathe. **Not suitable for engraving.**

Size 10G – **Use only for engraving.**

Note:

23 1521 Size 10G – a_p = max. 0.8 mm, f = 0.008 mm to 0.02 mm.

23 1515 Size 16/1521 Size 10; 16 – a_p = 4 mm, f = 0.03 mm.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
23 1515	250	250	250											90	80	65	110	250					
23 1521				150	140	130	130	120															



23 1515_10



23 1515_10G



23 1515_16

Type	10	10G	16
2Y 23 1515	–	–	eShop
2Y 23 1521	eShop	eShop	eShop
ISO code (23 1515)	10	2	10
ISO code (23 1521)	–	–	–
	SOGT 080208	SOGT 080201	SOGT 11T303 SOGT 11T308

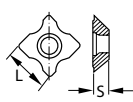
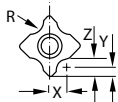
Garant Radius indexable inserts for NC spotting drills No. 231500

2-cutter radius indexable inserts.

Suitable for: No. 231500 size 16

Application: For convex radii on external Ø or in holes.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
23 1527/1528	250	250	250	200	150	150	150	150						90	80	65	110	250					

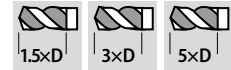
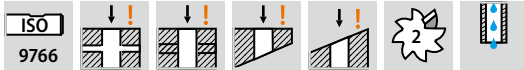


Type / Radius R	16/1	16/1,5	16/2	16/2,5	16/3	
2Y 23 1527	Radius indexable insert	Radius indexable insert	Radius indexable insert	Radius indexable insert	Radius indexable insert	10
X	mm	2.75	3.25	3.75	4.25	4.75
Y	mm	1.5	1.5	1.5	1.5	1.4
Z	mm	2.51	3	3.5	4	4.4



23 1528

Type / Radius R	16/1-3
2Y 23 1528	Radius indexable insert set
Content:	1 × each radiused indexable insert No. 231527
	Size 16/1; 16/1.5; 16/2; 16/2.5; 16/3



Garant HiPer drill high-performance drill, right-hand cutting

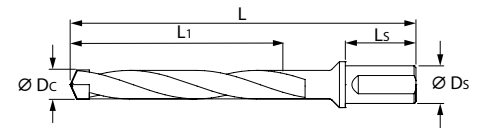
- Very high feed rates and maximum performance due to optimally matched geometries and materials.
 - Precise positioning of the cutter insert due to Vee insert seating and secure clamping by the centre bore.
 - High concentricity when assembled. (For holes up to IT9 accuracy)
 - Shank support for optimum stability in operation.
- Size 9–12,5 – Created by an additive procedure.

Note: The insert screw must be replaced after every fifth change of cutter insert.
Further sizes up to Ø 50.99 mm available on request.

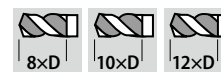
Further sizes
up to Ø 50.99 mm
available in the eShop.



23 1605



Ø D _c	215 23 1600	215 23 1605	215 23 1610	Dia. range D _c	L ₁			Ø D _s	L _s	Clamping screw
	HiPer-Drill base body				23 1600	23 1605	23 1610			
mm	1.5xD	3xD	5xD	mm	mm	mm	mm	mm	mm	
9	—	eShop	eShop	9 – 9.49	—	29	48	12	45	231999 5IP1 (0.2 Nm)
9,5	—	eShop	eShop	9.5 – 9.99	—	30	50	12	45	231999 5IP1 (0.2 Nm)
10	—	eShop	eShop	10 – 10.49	—	32	53	16	48	231999 5IP1 (0.2 Nm)
10,5	—	eShop	eShop	10.5 – 10.99	—	33	55	16	48	231999 5IP1 (0.2 Nm)
11	—	eShop	eShop	11 – 11.49	—	35	58	16	48	231999 6IP (0.4 Nm)
11,5	—	eShop	eShop	11.5 – 11.99	—	36	60	16	48	231999 6IP (0.4 Nm)
12	—	eShop	eShop	12 – 12.49	—	38	63	16	48	231999 6IP (0.4 Nm)
12,5	—	eShop	eShop	12.5 – 12.99	—	39	65	16	48	231999 6IP (0.4 Nm)
13	eShop	eShop	eShop	13 – 13.49	21	41	68	16	48	231999 7IP (0.6 Nm)
13,5	eShop	eShop	eShop	13.5 – 13.99	21	42	70	16	48	231999 7IP (0.6 Nm)
14	eShop	eShop	eShop	14 – 14.49	22	44	73	16	48	231999 8IP (0.9 Nm)
14,5	eShop	eShop	eShop	14.5 – 14.99	23	45	75	16	48	231999 8IP (0.9 Nm)
15	eShop	eShop	eShop	15 – 15.99	24	48	80	20	50	231999 8IP (0.9 Nm)
16	eShop	eShop	eShop	16 – 16.99	26	51	85	20	50	231999 8IP1 (1.2 Nm)
17	eShop	eShop	eShop	17 – 17.99	27	54	90	20	50	231999 8IP1 (1.2 Nm)
18	eShop	eShop	eShop	18 – 18.99	29	57	95	25	56	231999 8IP1 (1.2 Nm)
19	eShop	eShop	eShop	19 – 19.99	30	60	100	25	56	231999 9IP (2.2 Nm)
20	eShop	eShop	eShop	20 – 20.99	32	63	105	25	56	231999 9IP (2.2 Nm)
21	eShop	eShop	eShop	21 – 21.99	33	66	110	25	56	231999 9IP (2.2 Nm)
22	eShop	eShop	eShop	22 – 22.99	35	69	115	25	56	231999 10IP (3.3 Nm)
23	eShop	eShop	eShop	23 – 23.99	36	72	120	25	56	231999 10IP (3.3 Nm)
24	eShop	eShop	eShop	24 – 24.99	38	75	125	32	60	231999 10IP (3.3 Nm)
25	eShop	eShop	eShop	25 – 25.99	39	78	130	32	60	231999 15IP (5.0 Nm)
26	eShop	eShop	eShop	26 – 26.99	41	81	135	32	60	231999 15IP (5.0 Nm)
27	eShop	eShop	eShop	27 – 27.99	42	84	140	32	60	231999 15IP (5.0 Nm)
28	eShop	eShop	eShop	28 – 28.99	44	87	145	32	60	231999 15IP1 (5.7 Nm)
29	eShop	eShop	eShop	29 – 29.99	45	90	150	32	60	231999 15IP1 (5.7 Nm)
30	eShop	eShop	eShop	30 – 30.99	47	93	155	32	60	231999 15IP1 (5.7 Nm)
31	eShop	eShop	eShop	31 – 31.99	48	96	160	32	60	231999 20IP (7.5 Nm)
32	eShop	eShop	eShop	32 – 32.99	50	99	165	32	60	231999 20IP (7.5 Nm)
33	eShop	eShop	eShop	33 – 33.99	51	102	170	32	60	231999 20IP (7.5 Nm)
34	eShop	eShop	eShop	34 – 34.99	53	105	175	32	60	231999 20IP1 (7.5 Nm)
35	eShop	eShop	eShop	35 – 35.99	54	106	180	32	60	231999 20IP1 (7.5 Nm)
36	eShop	eShop	eShop	36 – 36.99	56	111	185	32	60	231999 20IP1 (7.5 Nm)



Garant HiPer drill high-performance drill, right-hand cutting

- Very high feed rates and maximum performance due to optimally matched geometries and materials.
- Precise positioning of the cutter insert due to Vee insert seating and secure clamping by the centre bore.
- High concentricity when assembled.
- Shank support for optimum stability in operation.

23 1615 Size 9–12,5 – Created by an additive procedure.

23 1617/1620 – Polished flutes.

Note:

Further sizes up to Ø 50.99 mm available on request.

The insert screw must be replaced after every fifth change of cutter insert.

For process reliability when using the drill, initial pilot drilling to 1.5xD with the drill No. 231600 with the same cutter insert size and type is necessary. **The generation of a pilot hole improves process reliability.**

23 1615 – reduce v_f values by 20 %.

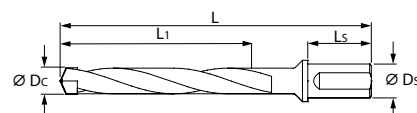
23 1617 – Reduce feed rates f by 10 % and v_c values by 30 %.

23 1620 – Reduce feed rates f by 10 % and v_c values by 40 %.



23 1620

Further sizes
up to Ø 50.99 mm
available in the eShop.



Ø D _c	23 1615	23 1617	23 1620	Dia. range D _c	L ₁	Ø D _s	L _s	Clamping screw
mm	8xD	10xD	12xD	mm	mm	mm	mm	
9	eShop	–	–	9 – 9.49	76	–	–	231999 5IP1 (0.2 Nm)
9,5	eShop	–	–	9.5 – 9.99	80	–	–	231999 5IP1 (0.2 Nm)
10	eShop	–	–	10 – 10.49	84	–	–	231999 5IP1 (0.2 Nm)
10,5	eShop	–	–	10.5 – 10.99	88	–	–	231999 5IP1 (0.2 Nm)
11	eShop	–	–	11 – 11.49	92	–	–	231999 6IP (0.4 Nm)
11,5	eShop	–	–	11.5 – 11.99	96	–	–	231999 6IP (0.4 Nm)
12	eShop	–	–	12 – 12.49	100	–	–	231999 6IP (0.4 Nm)
12,5	eShop	–	–	12.5 – 12.99	104	–	–	231999 6IP (0.4 Nm)
13	eShop	eShop	eShop	13 – 13.49	108	135	162	231999 7IP (0.6 Nm)
13,5	eShop	eShop	eShop	13.5 – 13.99	112	140	168	231999 7IP (0.6 Nm)
14	eShop	eShop	eShop	14 – 14.49	116	145	174	231999 8IP (0.9 Nm)
14,5	eShop	eShop	eShop	14.5 – 14.99	120	150	180	231999 8IP (0.9 Nm)
15	eShop	eShop	eShop	15 – 15.99	128	160	192	231999 8IP (0.9 Nm)
16	eShop	eShop	eShop	16 – 16.99	136	170	204	231999 8IP1 (1.2 Nm)
17	eShop	eShop	eShop	17 – 17.99	144	180	216	231999 8IP1 (1.2 Nm)
18	eShop	eShop	eShop	18 – 18.99	152	190	228	231999 8IP1 (1.2 Nm)
19	eShop	eShop	eShop	19 – 19.99	160	200	240	231999 9IP (2.2 Nm)
20	eShop	eShop	eShop	20 – 20.99	168	210	252	231999 9IP (2.2 Nm)
21	eShop	eShop	eShop	21 – 21.99	176	220	264	231999 9IP (2.2 Nm)
22	eShop	eShop	eShop	22 – 22.99	184	230	276	231999 10IP (3.3 Nm)
23	eShop	eShop	eShop	23 – 23.99	192	240	288	231999 10IP (3.3 Nm)
24	eShop	eShop	eShop	24 – 24.99	200	250	300	231999 10IP (3.3 Nm)
25	eShop	eShop	eShop	25 – 25.99	208	260	312	231999 15IP (5.0 Nm)
26	eShop	eShop	eShop	26 – 26.99	216	270	324	231999 15IP (5.0 Nm)
27	eShop	eShop	eShop	27 – 27.99	224	280	336	231999 15IP (5.0 Nm)
28	eShop	eShop	eShop	28 – 28.99	232	290	348	231999 15IP1 (5.7 Nm)
29	eShop	eShop	eShop	29 – 29.99	240	300	360	231999 15IP1 (5.7 Nm)
30	eShop	eShop	eShop	30 – 30.99	248	310	372	231999 15IP1 (5.7 Nm)
31	eShop	eShop	eShop	31 – 31.99	256	320	384	231999 20IP (7.5 Nm)
32	eShop	eShop	eShop	32 – 32.99	264	330	396	231999 20IP (7.5 Nm)
33	eShop	eShop	eShop	33 – 33.99	272	340	408	231999 20IP (7.5 Nm)
34	eShop	eShop	eShop	34 – 34.99	280	350	420	231999 20IP1 (7.5 Nm)
35	eShop	eShop	eShop	35 – 35.99	288	360	432	231999 20IP1 (7.5 Nm)
36	eShop	eShop	eShop	36 – 36.99	296	370	444	231999 20IP1 (7.5 Nm)

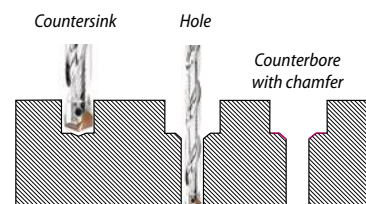
Garant Cutter inserts for HiPer drill high-performance drill, Form E 180°

Vee ground cutter inserts for precise positioning and stable seating.

Form E 180° cutter with 142° centre point and 0.5 mm protective chamfer

Application: For through holes for screws to DIN-ISO 273 and countersinking to DIN 74, sheet 2 form H, J and K, medium version.
For screws to DIN 912, 6912 and 7984, ISO 1207 (DIN 84).

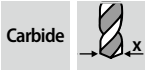
Note: Further sizes available on request. Cutting data apply for drilling bodies 5xD.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	Alu cast < 65 HRC	Alu cast < 67 HRC	Alu cast < 70 HRC	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	HARDLOX [®] 500 < 1600 N	INOX < 900 N	GG(G)					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	M	K					
23 1690				130	110	100	90	75						40	35	30							

Counterbore Ø	mm	10	11	15	18	20	24	26	30	33
23 1690	HiPer-Drill cutter insert Form E	HB7530	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
for DIN cylinder head screws		M5	M6	M8	M10	M12	M14	M16	M18	M20
suitable for through hole Ø	mm	5.5	6.6	9	11	13.5	15	17	19	21





Carbide

apart from
23 1645

only
23 1645

Garant Cutter inserts for HiPer drill high-performance drill, right-hand cutting

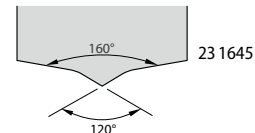
Vee ground cutter inserts for precise positioning and stable seating.
Concentricity when assembled $\leq 20 \mu\text{m}$. For holes up to IT9 accuracy.

23 1645 – **Special pyramidal point geometry**, optimal spot drilling – even with unstable conditions and long tool overhangs.
Such as when processing sheet metal and steel girders.
Also suitable for stack drilling.

Note: Cutting data applies for the base body 5xD.
Drill pilot holes exclusively with cutter insert of the same type.
23 1645 – 1xD maximum drilling depth without through-coolant.

Further sizes
up to $\varnothing 50.99 \text{ mm}$ available
in the eShop
as configurable material.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si								TOOLOX® 33 HRC	TOOLOX® 44 HRC	HARDOX® 500 < 1600 N	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G) < 900 N	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
23 1630	250	200	150															180					
23 1640				130	110	100	90	75			40	35	30				80						
23 1645				140	120	100											80						
23 1650	200	200	150											65	55	30							
23 1660						100	90	70									100						



$\varnothing D$	21M 23 1630	21M 23 1640	21M 23 1645	21M 23 1650	21M 23 1660	for base body size	Alu f	< 750 N	< 900 N	INOX f > 900 N	GG(G) f
mm	n7 HU7810	m7 HB7530	m7 HB3040	h7 HB7630	m7 HB7725	mm	23 1630 mm/rev.	23 1645 mm/rev.	23 1640 mm/rev.	23 1650 mm/rev.	23 1660 mm/rev.
9	eShop	eShop	—	eShop	—	9	0.23	—	0.17	0.11	—
9.2	eShop	—	—	—	—	9	0.23	—	—	—	—
9.5	eShop	eShop	—	eShop	—	9.5	0.23	—	0.17	0.11	—
9.7	eShop	eShop	—	eShop	—	9.5	0.23	—	0.17	0.11	—
9.9	eShop	eShop	—	eShop	—	9.5	0.23	—	0.17	0.11	—
10	eShop	eShop	—	eShop	eShop	10	0.25	—	0.18	0.12	0.23
10.2	eShop	eShop	—	eShop	—	10	0.25	—	0.18	0.12	—
10.5	—	eShop	—	eShop	eShop	10.5	—	—	0.18	0.12	0.23
10.7	—	eShop	—	eShop	—	10.5	—	—	0.18	0.12	—
11	eShop	eShop	—	eShop	eShop	11	0.26	—	0.19	0.13	0.23
11.1	eShop	eShop	—	—	—	11	0.26	—	0.19	—	—
11.5	eShop	eShop	—	eShop	eShop	11.5	0.26	—	0.19	0.13	0.23
11.7	—	eShop	—	eShop	—	11.5	—	—	0.19	0.13	—
12	eShop	eShop	—	eShop	eShop	12	0.27	—	0.2	0.14	0.24
12.5	eShop	eShop	—	eShop	eShop	12.5	0.27	—	0.2	0.14	0.24
12.7	—	eShop	—	eShop	—	12.5	—	—	0.2	0.14	—
12.8	—	eShop	—	eShop	—	12.5	—	—	0.2	0.14	—
13	eShop	eShop	—	eShop	eShop	13	0.29	—	0.2	0.14	0.26
13.1	—	eShop	—	eShop	—	13	—	—	0.2	0.14	—
13.2	—	eShop	—	eShop	—	13	—	—	0.2	0.14	—
13.3	—	—	—	eShop	—	13	—	—	—	0.14	—
13.4	—	eShop	—	—	—	13	—	—	0.2	—	—
13.5	eShop	eShop	—	eShop	eShop	13.5	0.29	—	0.21	0.15	0.26
13.6	—	eShop	—	eShop	—	13.5	—	—	0.21	0.15	—
13.7	—	eShop	—	eShop	—	13.5	—	—	0.21	0.15	—
13.8	—	eShop	—	eShop	—	13.5	—	—	0.21	0.15	—
13.9	—	eShop	—	eShop	—	13.5	—	—	0.21	0.15	—
14	eShop	eShop	eShop	eShop	eShop	14	0.31	0.26	0.22	0.15	0.28
14.1	—	eShop	eShop	eShop	—	14	—	0.26	0.22	0.15	—
14.2	—	eShop	eShop	eShop	—	14	—	0.26	0.22	0.15	—
14.3	—	eShop	—	eShop	—	14	—	—	0.22	0.15	—
14.5	eShop	eShop	eShop	eShop	—	14.5	0.31	0.26	0.23	0.16	—
14.6	—	eShop	—	eShop	—	14.5	—	—	0.23	0.16	—
14.7	eShop	eShop	—	eShop	—	14.5	0.31	—	0.23	0.16	—
14.75	eShop	—	—	eShop	—	14.5	0.31	—	—	0.16	—
14.8	—	eShop	—	—	—	14.5	—	—	0.23	—	—
14.9	—	eShop	—	—	—	14.5	—	—	0.23	—	—
15	eShop	eShop	eShop	eShop	eShop	15	0.34	0.26	0.23	0.16	0.31
15.1	eShop	eShop	eShop	eShop	—	15	0.34	0.26	0.23	0.16	—
15.2	—	eShop	eShop	eShop	—	15	—	0.26	0.23	0.16	—
15.25	—	eShop	—	eShop	—	15	—	—	0.23	0.16	—
15.3	—	eShop	—	eShop	—	15	—	—	0.23	0.16	—
15.4	—	eShop	—	eShop	—	15	—	—	0.23	0.16	—
15.5	eShop	eShop	eShop	eShop	—	15	0.34	0.26	0.24	0.17	—
15.6	—	—	—	eShop	—	15	—	—	—	0.17	—
15.7	eShop	eShop	—	eShop	—	15	0.34	—	0.24	0.17	—
15.8	—	eShop	eShop	eShop	—	15	—	0.26	0.24	0.17	—
15.9	—	eShop	—	eShop	—	15	—	—	0.24	0.17	—
16	eShop	eShop	eShop	eShop	eShop	16	0.37	0.26	0.25	0.17	0.33
16.1	—	eShop	eShop	eShop	—	16	—	0.26	0.25	0.17	—
16.2	—	eShop	eShop	eShop	—	16	—	0.26	0.25	0.17	—

Ø D	21M 23 1630	21M 23 1640	21M 23 1645	21M 23 1650	21M 23 1660	for base body size	Alu f 23 1630 mm/rev.	 f 23 1645 mm/rev.	 f 23 1640 mm/rev.	INOX f 23 1650 mm/rev.	GG(G) f 23 1660 mm/rev.
	HiPer-Drill cutter insert										
	n7 HU7810	m7 HB7530	m7 HB3040	h7 HB7630	m7 HB7725	mm					
16,25	eShop	eShop	—	eShop	—	16	0.37	—	0.25	0.18	—
16,3	—	eShop	—	eShop	—	16	—	—	0.25	0.18	—
16,4	—	eShop	—	eShop	—	16	—	—	0.25	0.18	—
16,5	eShop	eShop	eShop	eShop	eShop	16	0.37	0.26	0.26	0.18	0.33
16,6	—	eShop	—	eShop	—	16	—	—	0.26	0.18	—
16,7	—	eShop	—	eShop	—	16	—	—	0.26	0.18	—
16,75	eShop	eShop	—	eShop	—	16	0.37	—	0.26	0.18	—
16,8	—	eShop	—	eShop	—	16	—	—	0.26	0.18	—
16,9	—	eShop	—	eShop	—	16	—	—	0.26	0.18	—
17	eShop	eShop	eShop	eShop	eShop	17	0.38	0.26	0.27	0.19	0.34
17,1	—	eShop	—	eShop	—	17	—	—	0.27	0.19	—
17,2	—	eShop	—	eShop	—	17	—	—	0.27	0.19	—
17,3	—	eShop	—	eShop	—	17	—	—	0.27	0.19	—
17,4	—	—	—	eShop	—	17	—	—	—	0.19	—
17,5	eShop	eShop	eShop	eShop	eShop	17	0.38	0.26	0.27	0.19	0.34
17,6	—	eShop	—	eShop	—	17	—	—	0.27	0.19	—
17,7	eShop	eShop	—	eShop	—	17	0.38	—	0.28	0.19	—
17,8	—	eShop	eShop	eShop	—	17	—	0.26	0.28	0.19	—
17,9	—	eShop	—	eShop	—	17	—	—	0.28	0.19	—
18	eShop	eShop	eShop	eShop	eShop	18	0.4	0.3	0.28	0.2	0.36
18,1	—	eShop	—	eShop	—	18	—	—	0.28	0.2	—
18,2	—	eShop	—	eShop	—	18	—	—	0.28	0.2	—
18,25	eShop	eShop	—	—	—	18	0.4	—	0.28	—	—
18,3	eShop	—	—	eShop	—	18	0.4	—	—	0.2	—
18,4	—	eShop	—	—	—	18	—	—	0.28	—	—
18,5	eShop	eShop	eShop	eShop	—	18	0.4	0.3	0.29	0.2	—
18,7	eShop	eShop	—	eShop	—	18	0.4	—	0.29	0.2	—
18,8	—	eShop	—	eShop	—	18	—	—	0.29	0.2	—
18,9	—	eShop	—	eShop	—	18	—	—	0.29	0.2	—
19	eShop	eShop	eShop	eShop	eShop	19	0.4	0.3	0.3	0.21	0.36
19,1	—	eShop	—	eShop	—	19	—	—	0.3	0.21	—
19,2	—	eShop	—	eShop	—	19	—	—	0.3	0.21	—
19,25	—	eShop	—	eShop	—	19	—	—	0.3	0.21	—
19,3	—	eShop	—	eShop	—	19	—	—	0.3	0.21	—
19,4	—	eShop	—	eShop	—	19	—	—	0.3	0.21	—
19,5	eShop	eShop	eShop	eShop	eShop	19	0.41	0.3	0.3	0.21	0.37
19,6	—	eShop	—	—	—	19	—	—	0.3	—	—
19,7	—	eShop	—	eShop	—	19	—	—	0.3	0.21	—
19,75	eShop	eShop	—	eShop	—	19	0.41	—	0.3	0.21	—
19,8	—	eShop	eShop	eShop	—	19	—	0.3	0.3	0.21	—
19,9	—	eShop	—	eShop	—	19	—	—	0.3	0.21	—
20	eShop	eShop	eShop	eShop	eShop	20	0.42	0.3	0.31	0.22	0.38
20,4	eShop	eShop	—	eShop	—	20	0.42	—	0.31	0.22	—
20,5	eShop	eShop	eShop	eShop	eShop	20	0.42	0.3	0.32	0.22	0.38
20,7	—	eShop	—	eShop	—	20	—	—	0.32	0.22	—
20,75	eShop	eShop	—	—	—	20	0.42	—	0.32	—	—
21	eShop	eShop	eShop	eShop	eShop	21	0.42	0.3	0.32	0.23	0.38
21,5	eShop	eShop	eShop	eShop	eShop	21	0.42	0.3	0.33	0.23	0.38
21,7	eShop	eShop	—	eShop	—	21	0.42	—	0.33	0.23	—
22	eShop	eShop	eShop	eShop	eShop	22	0.43	0.33	0.33	0.23	0.39
22,25	—	eShop	—	eShop	—	22	—	—	0.34	0.24	—
22,5	eShop	eShop	eShop	eShop	eShop	22	0.43	0.33	0.34	0.24	0.39
22,7	—	eShop	—	eShop	—	22	—	—	0.34	0.24	—
22,75	eShop	eShop	—	eShop	—	22	0.43	—	0.34	0.24	—
23	eShop	eShop	eShop	eShop	eShop	23	0.44	0.33	0.35	0.24	0.4
23,25	—	eShop	—	eShop	—	23	—	—	0.35	0.24	—
23,5	eShop	eShop	—	eShop	—	23	0.44	—	0.35	0.25	—
23,7	—	eShop	—	eShop	—	23	—	—	0.36	0.25	—
23,75	—	eShop	—	eShop	—	23	—	—	0.36	0.25	—
24	eShop	eShop	eShop	eShop	eShop	24	0.45	0.33	0.36	0.25	0.41
24,5	eShop	eShop	eShop	eShop	eShop	24	0.45	0.33	0.37	0.26	0.41
24,7	eShop	eShop	—	eShop	—	24	0.45	—	0.37	0.26	—
24,75	eShop	eShop	—	eShop	—	24	0.45	—	0.37	0.26	—
25	eShop	eShop	eShop	eShop	eShop	25	0.46	0.33	0.38	0.26	0.41
25,4	eShop	eShop	—	eShop	—	25	0.46	—	0.38	0.27	—
25,5	—	eShop	eShop	eShop	—	25	—	0.33	0.38	0.27	—
25,7	eShop	eShop	—	eShop	—	25	0.46	—	0.38	0.27	—
26	eShop	eShop	eShop	eShop	eShop	26	0.47	0.33	0.38	0.27	0.42
26,5	eShop	eShop	eShop	eShop	eShop	26	0.47	0.33	0.39	0.27	0.42
27	eShop	eShop	eShop	eShop	—	27	0.47	0.35	0.4	0.28	—
27,5	—	eShop	—	—	—	27	—	—	0.4	—	—
27,75	—	eShop	—	—	—	27	—	—	0.4	—	—
28	eShop	eShop	eShop	eShop	eShop	28	0.48	0.35	0.41	0.29	0.43
28,25	—	eShop	—	eShop	—	28	—	—	0.41	0.29	—
28,5	—	eShop	—	eShop	—	28	—	—	0.42	0.29	—
29	eShop	eShop	eShop	eShop	eShop	29	0.49	0.35	0.42	0.3	0.44
29,5	eShop	eShop	—	eShop	—	29	0.49	—	0.43	0.3	—
30	eShop	eShop	eShop	eShop	eShop	30	0.5	0.35	0.44	0.31	0.45
30,25	—	eShop	—	—	—	30	—	—	0.44	—	—
30,5	—	eShop	—	eShop	eShop	30	—	—	0.44	0.31	0.45
30,75	—	eShop	—	—	—	30	—	—	0.44	—	—
31	eShop	eShop	eShop	eShop	eShop	31	0.51	0.35	0.45	0.31	0.46
31,5	eShop	eShop	—	eShop	—	31	0.51	—	0.45	0.31	—
32	eShop	eShop	eShop	eShop	—	32	0.52	0.35	0.45	0.32	—
32,75	eShop	eShop	—	eShop	—	32	0.53	—	0.46	0.32	—
33	eShop	eShop	—	eShop	eShop	33	0.54	—	0.46	0.32	0.49
34	eShop	eShop	—	eShop	eShop	34	0.55	—	0.47	0.33	0.5
35	eShop	eShop	—	eShop	eShop	35	0.56	—	0.47	0.33	0.5
36	eShop	eShop	—	eShop	eShop	36	0.57	—	0.48	0.33	0.51

HOLEX Spade drill tips


For holes up to IT10 accuracy.

23 2240/2245/2257/2258/2271/2272 – **Straight fluted.**

23 2255/2256/2265/2270/2274/2275 Size 36/48 – **Straight fluted.**

Note:

Further sizes available on request.

23 2255/2265/2274 – Reduce feed rates f by 5% and v_c values by 10%.

23 2256/2270/2275 – Reduce feed rates f by 10% and v_c values by 30%.



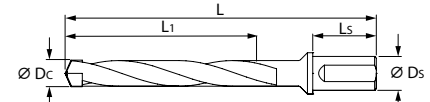
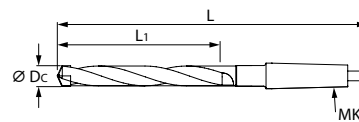
23 2255



23 2265



23 2274



Type	22G 23 2240	22G 23 2245	22G 23 2250	22G 23 2255	22G 23 2256	Dia. range D_c	L_1					$\varnothing D_s$	L_s	Clamping screws
Base body														
Parallel shank, with through-coolant														
	1.5xD	3xD	5xD	8xD	12xD	mm	23 2240	23 2245	23 2250	23 2255	23 2256	mm	mm	
12	eShop	eShop	eShop	eShop	eShop	12 – 12.5	18.8	31.8	60.3	111.1	144	20	50	232990 TX7
13	eShop	eShop	eShop	eShop	eShop	13 – 17.5	26	34.9	63.5	114.3	156	20	50	232990 TX8
18	eShop	eShop	eShop	eShop	eShop	18 – 24	36	66.7	168.3	269.9	288	25	56	232990 TX9
25	eShop	eShop	eShop	eShop	eShop	25 – 35	52.5	85.7	187.3	288.9	300	32	60	232990 TX15
36	eShop	eShop	eShop	eShop	eShop	36 – 47	70.5	120.7	209.6	349.3	432	40	70	232990 TX20
48	eShop	eShop	eShop	eShop	eShop	48 – 65	97.5	130.2	231.8	422.3	576	40	70	232990 TX20

Type	22G 23 2257	22G 23 2258	22G 23 2260	22G 23 2265	22G 23 2270	Dia. range D_c	L_1					MT	Clamping screws
Base body													
MT shank, without through-coolant													
	1.5xD	3xD	5xD	8xD	12xD	mm	23 2257	23 2258	23 2260	23 2265	23 2270		
12	eShop	eShop	eShop	eShop	eShop	12 – 12.5	18.8	31.8	60.3	111.1	144	2	232990 TX7
13	eShop	eShop	eShop	eShop	eShop	13 – 17.5	26	35	63.5	114.3	156	2	232990 TX8
18	eShop	eShop	eShop	eShop	eShop	18 – 24	36	69.8	171.5	273.1	288	3	232990 TX9
25	eShop	eShop	eShop	eShop	eShop	25 – 35	52.5	85.7	187.3	289	300	4	232990 TX15
36	eShop	eShop	eShop	eShop	eShop	36 – 47	70.5	120.6	209.5	349.3	432	4	232990 TX20
48	eShop	eShop	eShop	eShop	eShop	48 – 65	97.5	130.1	231.8	422.3	576	5	232990 TX20

Type	22G 23 2271	22G 23 2272	22G 23 2273	22G 23 2274	22G 23 2275	Dia. range D_c	L_1					MT	Clamping screws
Base body													
MT shank, with through-coolant													
	1.5xD	3xD	5xD	8xD	12xD	mm	23 2271	23 2272	23 2273	23 2274	23 2275		
12	eShop	eShop	eShop	eShop	eShop	12 – 12.5	18.8	31.8	60.3	111.1	144	2	232990 TX7
13	eShop	eShop	eShop	eShop	eShop	13 – 17.5	26	35	63.5	114.3	156	2	232990 TX8
18	eShop	eShop	eShop	eShop	eShop	18 – 24	36	69.8	171.5	273.1	288	3	232990 TX9
25	eShop	eShop	eShop	eShop	eShop	25 – 35	52.5	85.7	187.3	289	300	4	232990 TX15
36	eShop	eShop	eShop	eShop	eShop	36 – 47	70.5	120.6	209.5	349.3	432	4	232990 TX20
48	eShop	eShop	eShop	eShop	eShop	48 – 65	97.5	130.1	231.8	422.3	576	5	232990 TX20

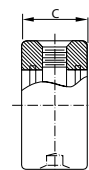
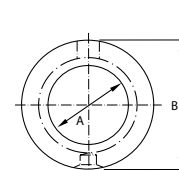
Coolant supply ring for MT flat drills with through-coolant.

The coolant supply ring is mounted on the drill. The coolant can be fed from outside via the coolant hose connections through the ring and into the cooling channels.

Suitable for:

23 2277 – **HOLEX flat drills No. 232271 - 232275.**

23 2278/2279 – **Coolant supply ring No. 232277.**



23 2277

Size	22G 23 2277	for flat drill size	Internal $\varnothing$ A	External $\varnothing$ B	Height C	Coolant hose port
	Coolant supply ring for flat drills		mm	mm	mm	in
1	eShop	12; 13	19.05	44.45	22.23	R 1/8
2	eShop	18; 25	25.4	53.97	28.57	R 1/8
3	eShop	36	31.75	63.5	34.92	R 1/4
4	eShop	48	44.45	76.2	34.92	R 1/4

Size	22G 23 2278	for coolant ring size	suitable for hose outer $\varnothing$	Connection thread
	Hose coupling for coolant		mm	in
1	eShop	1; 2	10	R1/8
2	eShop	1; 2	12	R1/8
3	eShop	3; 4	10	R1/4
4	eShop	3; 4	12	R1/4



23 2278

Size	22G 23 2279	for coolant ring size	suitable for hose inner $\varnothing$	Connection thread
	Hose coupling for coolant		mm	in
1	eShop	1; 2	9	R1/8
2	eShop	3; 4	9	R1/4



23 2279

**HOLEX** Drill inserts for flat drills

Exchangeable HSS cutter for universal application. Cannot be reground.

With chip breaker. Pointed tip for high stability and self-centring.

For holes up to IT10 accuracy.

Note: Other sizes, version with solid carbide cutting edges and 180° cutting edges, available on request.

HSS

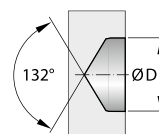


23 2282

HSS
E-PM



23 2286



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10% Si										INOX	INOX	Ti	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
23 2282	180	130	100	45	45	30	25						22	22		45	90		●			
23 2286	200	200	120	65	60	55	50	30					30	20	15	60	140					

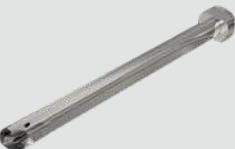
Ø D	22F 23 2282		22F 23 2286		for base body type		 f < 900 N		 f > 900 N		Ø D	22F 23 2282		22F 23 2286		for base body type		 f < 900 N		 f > 900 N	
	Drill insert with pointed tip						Drill insert with pointed tip														
	mm	HSS TiN	HSS-E-PM TiAlN	23 2282 mm/rev.	23 2286 mm/rev.	23 2282 mm/rev.	23 2286 mm/rev.	mm	HSS TiN	HSS-E-PM TiAlN		23 2282 mm/rev.	23 2286 mm/rev.	mm	HSS TiN	HSS-E-PM TiAlN	23 2282 mm/rev.	23 2286 mm/rev.	mm	HSS TiN	HSS-E-PM TiAlN
12	eShop	eShop	12	0.08	0.13	0.12	0.12	34	eShop	eShop	25	0.25	0.34	0.24	0.24						
12,5	eShop	eShop	12	0.08	0.13	0.12	0.12	35	eShop	eShop	25	0.25	0.34	0.24	0.24						
13	eShop	eShop	13	0.14	0.19	0.17	0.18	36	eShop	eShop	36	0.25	0.43	0.28	0.3						
13,5	eShop	eShop	13	0.14	0.19	0.17	0.18	37	eShop	eShop	36	0.25	0.43	0.28	0.3						
14	eShop	eShop	13	0.14	0.19	0.17	0.18	38	eShop	eShop	36	0.25	0.43	0.28	0.3						
14,5	eShop	eShop	13	0.14	0.19	0.17	0.18	39	eShop	eShop	36	0.25	0.43	0.28	0.3						
15	eShop	eShop	13	0.14	0.19	0.17	0.18	40	eShop	eShop	36	0.25	0.43	0.28	0.3						
15,5	eShop	eShop	13	0.14	0.19	0.17	0.18	41	eShop	eShop	36	0.25	0.43	0.28	0.3						
16	eShop	eShop	13	0.14	0.19	0.17	0.18	42	eShop	eShop	36	0.25	0.43	0.28	0.3						
16,5	eShop	eShop	13	0.14	0.19	0.17	0.18	43	eShop	eShop	36	0.25	0.43	0.28	0.3						
17	eShop	eShop	13	0.14	0.19	0.17	0.18	44	eShop	eShop	36	0.25	0.43	0.28	0.3						
17,5	eShop	eShop	13	0.14	0.19	0.17	0.18	45	eShop	eShop	36	0.25	0.43	0.28	0.3						
18	eShop	eShop	18	0.18	0.23	0.19	0.2	46	eShop	eShop	36	0.25	0.43	0.28	0.3						
18,5	eShop	eShop	18	0.18	0.23	0.19	0.2	47	eShop	eShop	36	0.25	0.43	0.28	0.3						
19	eShop	eShop	18	0.18	0.23	0.19	0.2	48	eShop	eShop	48	0.25	0.43	0.28	0.3						
19,5	eShop	eShop	18	0.18	0.23	0.19	0.2	49	eShop	eShop	48	0.25	0.43	0.28	0.3						
20	eShop	eShop	18	0.18	0.23	0.19	0.2	50	eShop	eShop	48	0.29	0.5	0.35	0.36						
20,5	eShop	eShop	18	0.18	0.23	0.19	0.2	51	eShop	eShop	48	0.29	0.5	0.35	0.36						
21	eShop	eShop	18	0.18	0.23	0.19	0.2	52	eShop	eShop	48	0.29	0.5	0.35	0.36						
22	eShop	eShop	18	0.18	0.23	0.19	0.2	53	eShop	eShop	48	0.29	0.5	0.35	0.36						
23	eShop	eShop	18	0.18	0.23	0.19	0.2	54	eShop	eShop	48	0.29	0.5	0.35	0.36						
24	eShop	eShop	18	0.18	0.23	0.19	0.2	55	eShop	eShop	48	0.29	0.5	0.35	0.36						
25	eShop	eShop	25	0.25	0.34	0.24	0.24	56	eShop	eShop	48	0.29	0.5	0.35	0.36						
26	eShop	eShop	25	0.25	0.34	0.24	0.24	57	eShop	eShop	48	0.29	0.5	0.35	0.36						
26,5	eShop	eShop	25	0.25	0.34	0.24	0.24	58	eShop	eShop	48	0.29	0.5	0.35	0.36						
27	eShop	eShop	25	0.25	0.34	0.24	0.24	59	eShop	eShop	48	0.29	0.5	0.35	0.36						
28	eShop	eShop	25	0.25	0.34	0.24	0.24	60	eShop	eShop	48	0.29	0.5	0.35	0.36						
29	eShop	eShop	25	0.25	0.34	0.24	0.24	61	eShop	eShop	48	0.29	0.5	0.35	0.36						
30	eShop	eShop	25	0.25	0.34	0.24	0.24	62	eShop	eShop	48	0.29	0.5	0.35	0.36						
31	eShop	eShop	25	0.25	0.34	0.24	0.24	63	eShop	eShop	48	0.29	0.5	0.35	0.36						
32	eShop	eShop	25	0.25	0.34	0.24	0.24	64	eShop	eShop	48	0.29	0.5	0.35	0.36						
33	eShop	eShop	25	0.25	0.34	0.24	0.24	65	eShop	eShop	48	0.29	0.5	0.35	0.36						

SUMOCHAM
 CHAMDRILL LINE

TECHNICALLY OUTSTANDING LEVEL IN INTERCHANGEABLE HEAD DRILLING.

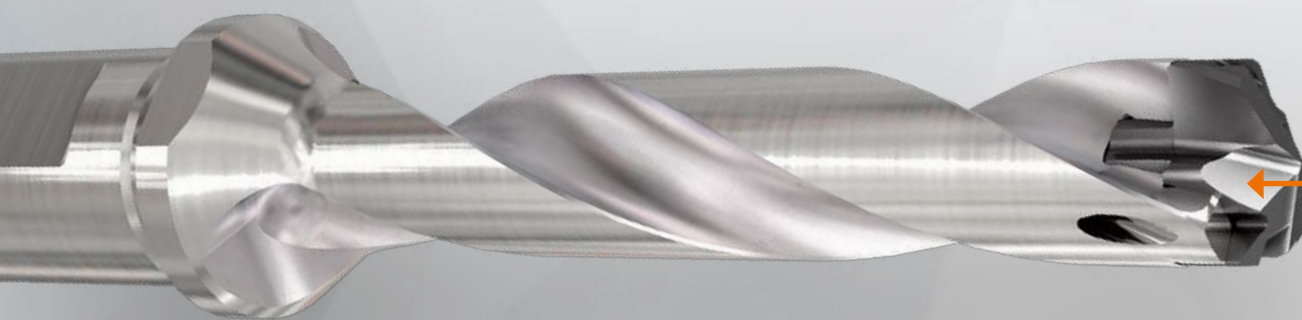
- **Optimised design** of the globally established CHAMDRILL line.
- **Revolutionary clamping system** for convenient drilling head replacement without screw connections or tool removal.
- **Direct conversion of cutting forces** into clamping forces – without plastic deformation of the joint.
- **Significant increase in productivity and cost-effectiveness** due to drastically extended tool life.
- **Optimal stability** of the drill body with twisted cooling channels.
- **Application-specific drilling heads** in four standard geometries and a wide range of special geometries.

DRILL BODY

	DCN...A – drill body with drive flat Length range: 1.5 / 3 / 5 / 8xD Diameter range: 6 – 32.9 mm
	DCN...R – drill body with round shank Length range: 1.5 / 3 / 5 / 12xD Diameter range: 6 – 32.9 mm
	DCN...C – drill body with round shank Specifically for lathes Length range: 3 / 5 / 8 / 12xD Diameter range: 4 – 9.9 mm
	DCNM – FLEXFIT connection – modular Length range: 3xD Diameter range: 6 – 20.9 mm
	MNSNT – deep hole drill body Length range: 200 – 400 mm Diameter range: 10 – 25.9 mm
	DCNS – drill body for chamfer application Length range: 3 / 5xD Diameter range: 7.5 – 25.9 mm
	CHAMRING – chamfer attachment or chamfering ring Diameter range: 8 – 25 mm



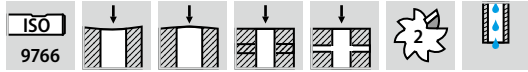
23



DRILLING HEADS

		N	P	H	M	S	O
	* ICP – steel geometry Diameter range: 4 – 32.9 mm		●	●	○		●
	* ICP-2M – steel geometry with 2 guide chamfers Diameter range: 6 – 25.9 mm		●	○			○
	ICK – cast geometry Diameter range: 5 – 32.9 mm		○				●
	ICK-2M – cast geometry with 4 guide chamfers Diameter range: 6 – 25.9 mm		○				●
	* FCP – steel flat head geometry Diameter range: 4 – 32.5 mm		●	○	○		●
	* HCP-IQ – self-centering steel geometry Diameter range: 4 – 32.9 mm		●				○
	ICG – chip splitting geometry Diameter range: 14 – 25.9 mm	○	●		●	○	○
	QCP-2M – self-centering steel geometry with 4 guide chamfers Diameter range: 4.5 – 25.9 mm		●				○
	* ICM – stainless geometry Diameter range: 5 – 32.9 mm	○	○		●	●	
	ICN – aluminium geometry Diameter range: 5.1 – 32.9 mm	●					

* Drill bodies and drilling heads are available directly from the Hoffmann Group warehouse.



SUMOCAM high-performance drill, right-hand cutting

SUMOCAM interchangeable head drilling system for **highly efficient drilling** with interchangeable cutting edges. **Unique clamping mechanism** for convenient fixing of the cutter insert without additional clamping screw. **Versatile material use** due to comprehensive cutter insert range. **Optimum tool stability** with simultaneously helical coolant channels for **high concentricity** and **lowest possible axial run-out** of the bore.

Other available versions:

base body with round shank, base body for machining chamfers on bores when a chamfer ring is attached, base body especially for use in multi-spindle, sliding headstock and production lathes.

Tolerance class: IT8-IT9, concentricity: 0.03 mm.

Application: With drilling heads **No. 231740 – 231790**.

Supplied with: Drill body incl. assembly key for drilling heads.

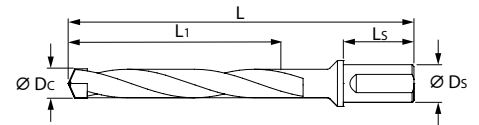


Delivery of drill body without drilling head.

23 1705

Note:

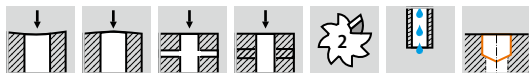
- Always select a **strategy** with medium cutting speeds and high feed rates.
 - **No rapid traverse and no spindle anti-clockwise rotation during retraction.**
 - **Drilling convex / concave surfaces:** Radius of curvature $> 15 \times D_c$ required, reduce feed rate by up to 50%.
 - For **cross holes**, the maximum permissible diameter is 1/4 of the nominal diameter D_c .
 - **Stack drilling** requires stable conditions, reduce gaps between workpiece elements.
 - **Oblique drill entry and exit** up to 7° inclination possible with reduced feed rate (approx. 20 - 30%).
 - Designation convention: **DCN** [size]-[L₁]-[ØD_s]-[A]-[L/D]
- Examples:
No. 231702 6 DCN 060-009-12A-1.5D
No. 231705 6 DCN 060-018-12A-3D



Size	23K 23 1702	23K 23 1705	23K 23 1710	Dia. range D _c	L ₁			Ø D _s	L _s
SUMOCAM drill body									
Weldon shank DCN A									
	1.5xD	3xD	5xD	mm	23 1702 mm	23 1705 mm	23 1710 mm	mm	mm
6	—	—	—	6 – 6.4	9	18	30	12	45
6,5	—	—	—	6.5 – 6.9	10	20	33	12	45
7	—	—	—	7 – 7.4	11	21	35	12	45
7,5	—	—	—	7.5 – 7.9	11	23	38	12	45
8	—	—	—	8 – 8.4	12	24	40	12	45
8,5	—	—	—	8.5 – 8.9	13	25	42	12	45
9	—	—	—	9 – 9.4	14	27	45	12	45
9,5	—	—	—	9.5 – 9.9	14	29	48	12	45
10	—	—	—	10 – 10.4	15	30	50	16	48
10,5	—	—	—	10.5 – 10.9	16	32	53	16	48
11	—	—	—	11 – 11.4	17	33	55	16	48
11,5	—	—	—	11.5 – 11.9	17	35	58	16	48
12	—	—	—	12 – 12.4	18	36	60	16	48
12,5	—	—	—	12.5 – 12.9	19	37	62	16	48
13	—	—	—	13 – 13.4	20	39	65	16	48
13,5	—	—	—	13.5 – 13.9	20	41	68	16	48
14	—	—	—	14 – 14.4	21	42	70	16	48
14,5	—	—	—	14.5 – 14.9	22	44	73	16	48
15	—	—	—	15 – 15.9	23	45	75	20	50
16	—	—	—	16 – 16.9	24	48	80	20	50
17	—	—	—	17 – 17.9	26	51	85	20	50
18	—	—	—	18 – 18.9	27	54	90	25	56
19	—	—	—	19 – 19.9	29	57	95	25	56
20	—	—	—	20 – 20.9	30	60	100	25	56
21	—	—	—	21 – 21.9	32	63	105	25	56
22	—	—	—	22 – 22.9	33	66	110	25	56
23	—	—	—	23 – 23.9	35	69	115	32	60
24	—	—	—	24 – 24.9	36	72	120	32	60
25	—	—	—	25 – 25.9	38	75	125	32	60
26	—	—	—	26 – 26.9	39	78	130	32	60
27	—	—	—	27 – 27.9	41	81	135	32	60
28	—	—	—	28 – 28.9	42	84	140	32	60
29	—	—	—	29 – 29.9	44	87	145	32	60
30	—	—	—	30 – 30.9	45	90	150	32	60
31	—	—	—	31 – 31.9	47	93	155	32	60
32	—	—	—	32 – 32.9	48	96	160	32	60



23



SUMOCHAM high-performance drill, right-hand cutting

SUMOCHAM interchangeable head drilling system for **highly efficient drilling** with interchangeable cutting edges. **Unique clamping mechanism** for convenient fixing of the cutter insert without additional clamping screw.

Versatile material use due to comprehensive cutter insert range.

Optimum tool stability with simultaneously helical coolant channels for **high concentricity** and **lowest possible axial run-out** of the bore.

Other available versions: base body with round shank, base body for machining chamfers on bores when a chamfer ring is attached, base body especially for use in multi-spindle, sliding headstock and production lathes.

Tolerance class: IT8-IT9, concentricity: 0.03 mm.

Application: With drilling heads **No. 231740 – 231790**.

Supplied with: Drill body incl. assembly key for drilling heads.

Note:

- Always select a **strategy** with medium cutting speeds and high feed rates.
- **No rapid traverse and no spindle anti-clockwise rotation during retraction.**
- **For drilling depths of 8×D and more, piloting of at least 1.5 × D_c with same cutter insert required.**
- **Drilling convex / concave surfaces:** Radius of curvature > 15 × D_c required, reduce feed rate by up to 50%.
- **For cross holes,** the maximum permissible diameter is 1/4 of the nominal diameter D_c.
- **Stack drilling** requires stable conditions, reduce gaps between workpiece elements.
- **Oblique drill entry and exit** up to 7° inclination possible with reduced feed rate (approx. 20 - 30%).
- Designation convention 8×D: **DCN** [size]-[L₁]-[ØD_s]A-[L/D]
- Designation convention 12×D: **DCN** [size]-[L₁]-[ØD_s]R-[L/D]
- Examples:
No. 231715 6 DCN 060-048-12A-8D
No. 231720 8 DCN 080-096-12R-12D



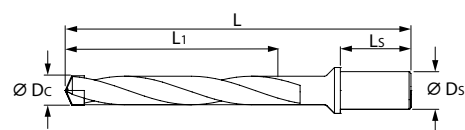
Delivery of drill body without drilling head.

231715



Delivery of drill body without drilling head.

231720



Size	23K	23 1715	23K	23 1720	Dia. range D _c	L ₁		Ø D _s	L _s
	SUMOCHAM drill body								
	Weldon shank DCN A 8×D	Parallel shank DCN R 12×D	23 1715	23 1720					
					mm	mm	mm	mm	mm
6		—		—	6 – 6.4	48	—	12	45
6,5		—		—	6.5 – 6.9	52	—	12	45
7		—		—	7 – 7.4	56	—	12	45
7,5		—		—	7.5 – 7.9	60	—	12	45
8		—		—	8 – 8.4	64	96	12	45
8,5		—		—	8.5 – 8.9	68	102	12	45
9		—		—	9 – 9.4	72	108	12	45
9,5		—		—	9.5 – 9.9	76	114	12	45
10		—		—	10 – 10.4	80	120	16	48
10,5		—		—	10.5 – 10.9	84	126	16	48
11		—		—	11 – 11.4	88	132	16	48
11,5		—		—	11.5 – 11.9	92	138	16	48
12		—		—	12 – 12.4	96	144	16	48
12,5		—		—	12.5 – 12.9	100	150	16	48
13		—		—	13 – 13.4	104	156	16	48
13,5		—		—	13.5 – 13.9	108	162	16	48
14		—		—	14 – 14.4	112	168	16	48
14,5		—		—	14.5 – 14.9	116	174	16	48
15		—		—	15 – 15.9	120	180	20	50
16		—		—	16 – 16.9	128	192	20	50
17		—		—	17 – 17.9	136	204	20	50
18		—		—	18 – 18.9	144	216	25	56
19		—		—	19 – 19.9	152	228	25	56
20		—		—	20 – 20.9	160	240	25	56
21		—		—	21 – 21.9	168	252	25	56
22		—		—	22 – 22.9	176	264	25	56
23		—		—	23 – 23.9	184	276	32	60
24		—		—	24 – 24.9	192	288	32	60
25		—		—	25 – 25.9	200	300	32	60
26		—		—	26 – 26.9	208	312	32	60
27		—		—	27 – 27.9	216	324	32	60
28		—		—	28 – 28.9	224	336	32	60
29		—		—	29 – 29.9	232	348	32	60
30		—		—	30 – 30.9	240	360	32	60
31		—		—	31 – 31.9	248	372	32	60
32		—		—	32 – 32.9	256	384	32	60

Carbide



SUMOCHAM drilling heads for high-performance drill, right-hand cutting

Vee ground drilling head for precise positioning and stable seating. Angled, **radial stop surfaces** for a significant increase in clamping force due to the cutting forces acting during machining. For productive drilling with **high feed rates**.

23 1740 – ICP

Main area of application **ISO P, ISO M** (especially duplex) as well as **ISO H**.

Unique cutting edge preparation for the best possible compromise between cutting edge stability and cutting sharpness.

23 1742 – ICP-2M

Main area of application **ISO P**. Higher accuracy and better surface quality due to **4 guide chamfers**.

Optimum roundness of the bore, low axial forces, increased stability, increased metal removal rate.

23 1745 – HCP-IQ

Main area of application **ISO P** and **ISO K**. **Best possible centring capability**, machining of curved surfaces.

Not for use in ductile materials.

23 1750 – ICM

Main area of application **ISO M, ISO S** (especially Inconel and titanium) as well as **ISO N**.

Cutting edge with negative chamfer and special rounding – especially for stainless steel machining.

23 1790 – FCP

Main application **ISO P** and **ISO K**, secondary application **ISO M**. **Flat head geometry** with centring point.

Advantageous for radial displacement and oblique material exit.

Note:

Cutting data applies for the base body 5xD. Drill pilot holes exclusively with drilling head of the same type – in particular for drilling heads FCP and QCP-2M. Please observe the application instructions for the base body. Cutting tolerance of the inserts: **k7** (positive toleranced cutting edge diameter).

Designation convention: [type] [Ø D_c] [-addition] [cutting material]

Examples:

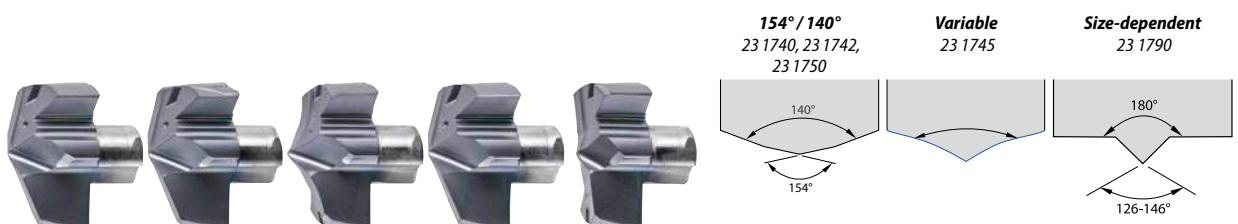
No. 231740 6.5 ICP 065 IC908

No. 231742 18.5 ICP 185-2M IC908

No. 231745 18.5 HCP 185-IQ IC908

Size 6–19,5 – **The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.**

Suitable for/ v _c [m/min]	Alu cast > 10% Si	Alu cast < 10% Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	HARDOX® 500 < 1600 N	INOX < 900 N	INOX > 900 N	Ti > 850 N	Inconel®	GG(G)	CuZn					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	S	K	N					
23 1740			100	90	100	70	55	35	35	70	60	35	50	50	35	35	120	155	○	●			
23 1742			100	90	100	70	55	35	35	70	60	35	50	50	35	35	120	155	○	●			
23 1745			100	90	100	70	55			70	60						120	155	○	●			
23 1750	155	120	100	90	100	70	55			70	60		50	50	35	35	120	155	○	●			
23 1790			100	90	100	70	55	35	35	70	60		50	50		35	120	155	○	●			



Ø D _c	23J 23 1740	23J 23 1742	23J 23 1745	23J 23 1750	23J 23 1790	for base body size	for base body size	for base body size	for base body size	for base body size
	SUMOCHAM drilling head									
	ICP k7	ICP-2M k7	HCP-IQ k7	ICM k7	FCP k7					
mm	IC908	IC908	IC908	IC908	IC908					
6	–	–	–	–	–	1	6	0.1	0.09	0.06
6,5	–	–	–	–	–	1	6.5	0.1	0.09	0.06
6,8	–	–	–	–	–	1	6.5	0.1	0.09	0.06
7	–	–	–	–	–	1	7	0.1	0.09	0.06
7,5	–	–	–	–	–	1	7	0.1	0.09	0.06
8	–	–	–	–	–	1	8	0.16	0.12	0.08
8,5	–	–	–	–	–	1	8	0.16	0.12	0.08
9	–	–	–	–	–	1	9	0.16	0.12	0.08
9,5	–	–	–	–	–	1	9	0.16	0.12	0.08
10	–	–	–	–	–	1	10	0.2	0.15	0.1
10,2	–	–	–	–	–	1	10	0.2	0.15	0.1
10,5	–	–	–	–	–	1	10	0.2	0.15	0.1
11	–	–	–	–	–	1	11	0.2	0.15	0.1
11,5	–	–	–	–	–	1	11	0.2	0.15	0.1

Ø D _c	23J 23 1740	23J 23 1742	23J 23 1745	23J 23 1750	23J 23 1790		for base body size	 < 900 N f 23 1740 23 1742 23 1745 23 1790 mm/rev.	 INOX > 900 N f 23 1750 mm/rev.	 < 55 HRC f 23 1740 23 1790 mm/rev.	 Inconel® f 23 1750 mm/rev.
	SUMOCHAM drilling head										
	ICP k7	ICP-2M k7	HCP-IQ k7	ICM k7	FCP k7						
mm	IC908	IC908	IC908	IC908	IC908						
12	—	—	—	—	—	1	12	0.24	0.17	0.14	0.12
12,5	—	—	—	—	—	1	12	0.24	0.17	0.14	0.12
13	—	—	—	—	—	1	13	0.24	0.17	0.14	0.12
13,5	—	—	—	—	—	1	13	0.24	0.17	0.14	0.12
13,8	—	—	—	—	—	1	13	0.24	—	0.14	—
14	—	—	—	—	—	1	14	0.26	0.2	0.16	0.15
14,2	—	—	—	—	—	1	14	0.26	—	0.16	—
14,5	—	—	—	—	—	1	14	0.26	0.2	0.16	0.15
15	—	—	—	—	—	1	15	0.26	0.2	0.16	0.15
15,5	—	—	—	—	—	1	15	0.26	0.2	0.16	0.15
16	—	—	—	—	—	1	16	0.31	0.21	0.18	0.16
16,5	—	—	—	—	—	1	16	0.31	0.21	0.18	0.16
17	—	—	—	—	—	1	17	0.31	0.21	0.18	0.16
17,5	—	—	—	—	—	1	17	0.31	0.21	0.18	0.16
17,8	—	—	—	—	—	1	17	0.31	—	0.18	—
18	—	—	—	—	—	1	18	0.31	0.21	0.18	0.16
18,5	—	—	—	—	—	1	18	0.31	0.21	0.18	0.16
19	—	—	—	—	—	1	19	0.31	0.21	0.18	0.16
19,5	—	—	—	—	—	1	19	0.31	0.21	0.18	0.16
20	—	—	—	—	—	1	20	0.35	0.24	0.2	0.18
20,5	—	—	—	—	—	1	20	0.35	0.24	0.2	0.18
21	—	—	—	—	—	1	21	0.35	0.24	0.2	0.18
21,5	—	—	—	—	—	1	21	0.35	0.24	0.2	0.18
22	—	—	—	—	—	1	22	0.35	0.24	0.2	0.18
22,5	—	—	—	—	—	1	22	0.35	0.24	0.2	0.18
23	—	—	—	—	—	1	23	0.35	0.24	0.2	0.18
23,5	—	—	—	—	—	1	23	0.35	0.24	0.2	0.18
24	—	—	—	—	—	1	24	0.35	0.24	0.2	0.18
24,5	—	—	—	—	—	1	24	0.35	0.24	0.2	0.18
25	—	—	—	—	—	1	25	0.35	0.24	0.2	0.18
25,5	—	—	—	—	—	1	25	0.35	0.24	0.2	0.18
25,9	—	—	—	—	—	1	—	0.35	—	—	—
26	—	—	—	—	—	1	26	0.4	0.27	0.22	0.2
26,5	—	—	—	—	—	1	26	0.4	0.27	0.22	0.2
27	—	—	—	—	—	1	27	0.4	0.27	0.22	0.2
27,5	—	—	—	—	—	1	27	0.4	0.27	0.22	0.2
28	—	—	—	—	—	1	28	0.4	0.27	0.22	0.2
28,5	—	—	—	—	—	1	28	0.4	0.27	0.22	0.2
29	—	—	—	—	—	1	29	0.4	0.27	0.22	0.2
29,5	—	—	—	—	—	1	29	0.4	0.27	0.22	0.2
30	—	—	—	—	—	1	30	0.4	0.27	0.22	0.2
30,5	—	—	—	—	—	1	30	0.4	0.27	0.22	0.2
31	—	—	—	—	—	1	31	0.4	0.27	0.22	0.2
31,5	—	—	—	—	—	1	31	0.4	0.27	0.22	0.2
32	—	—	—	—	—	1	32	0.4	0.27	0.22	0.2
32,5	—	—	—	—	—	1	32	0.4	0.27	0.22	0.2



Please also see our extended SUMOCHAM drilling head range.

Available via the Hoffmann Group eShop under the ISCAR item designation*.

STEEL AND CAST IRON

P K

154° / 140°



ICK

154° / 140°



ICK-2M

4 guide chamfers

ALUMINIUM AND NON-FERROUS METALS

N

154° / 140°



ICN

STEEL AND STAINLESS / UNI

P M

130°



ICG

STEEL

P

136° / 120°



QCP-2M

4 guide chamfers

* ISCAR item designation:

[Type] [Ø D_c]-[Addition] [Tool material]

Example: ICK-2M Ø 6.5 mm

ICK 065- 2M IC908

Type Ø D_c Addition Tool material



Garant Universal indexable drill MTC right-hand cutting, with combination shank

High stability and very high process reliability.

23 2302 – With shank Ø 20 mm, particularly suitable for **driven tools** (see Group 31).

Application: For stationary and rotating application.
For holes free of withdrawal scoring and exact dimensional accuracy (approx. ± 0.1 mm).

Also suitable for machines with low drive power.

Especially for **MTC (Multi Task Cutting)** use on the new generation of turning/milling centres (**MTM**).

Note:

CAUTION!

A disc falls off when the drill exits.
Risk of injury if the component is rotating.
Please take safety precautions.

Counterboring tools with up to 2 steps to your specification available on request.
(Minimum order quantity: 2 pieces).

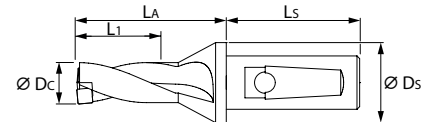


23 2300



23 2302

The enquiry form can be found in the eShop on the product page under "Downloads & Documents".



Ø D _c	23 2298	23 2300	23 2302	23 2310	L _A			Ø D _s			L _s			ISO code indexable insert	Set of insert screws
	Indexable drill combination shank														
			Shank Ø 20 mm 3xD		23 2298	23 2300	23 2310	23 2298 23 2310	23 2300	23 2302	23 2298 23 2310	23 2300	23 2302		
mm	2xD	3xD		4xD	mm	mm	mm	mm	mm	mm	mm	mm	mm		
14	eShop	eShop	eShop	eShop	52	66	80	20	25	20	50	56	50	WOEX 030204	239700 6IP (0.6 Nm)
15	eShop	eShop	eShop	eShop	54	69	84	20	25	20	50	56	50	WOEX 030204	239700 6IP (0.6 Nm)
16	eShop	eShop	eShop	eShop	56	72	88	20	25	20	50	56	50	WOEX 030204	239700 6IP (0.6 Nm)
17	eShop	eShop	eShop	eShop	58	75	92	20	25	20	50	56	50	WOEX 030204	239700 6IP (0.6 Nm)
17,5	—	eShop	eShop	—	—	78	—	—	25	20	—	56	50	WOEX 030204	239700 6IP (0.6 Nm)
18	eShop	eShop	eShop	eShop	60	78	96	20	25	20	50	56	50	WOEX 030204	239700 6IP (0.6 Nm)
18,5	—	eShop	eShop	—	—	81	—	—	25	20	—	56	50	WOEX 030204	239700 6IP (0.6 Nm)
19	eShop	eShop	eShop	eShop	62	81	100	20	25	20	50	56	50	WOEX 030204	239700 6IP (0.6 Nm)
19,5	—	eShop	eShop	—	—	84	—	—	25	20	—	56	50	WOEX 030204	239700 6IP (0.6 Nm)
20	eShop	eShop	eShop	eShop	64	84	104	25	25	20	56	56	50	WOEX 040304	239700 6IP1 (1.0 Nm)
21	eShop	eShop	eShop	eShop	66	87	108	25	25	20	56	56	50	WOEX 040304	239700 6IP1 (1.0 Nm)
22	eShop	eShop	eShop	eShop	68	90	112	25	25	20	56	56	50	WOEX 040304	239700 6IP1 (1.0 Nm)
22,5	—	eShop	eShop	—	—	93	—	—	25	20	—	56	50	WOEX 040304	239700 6IP1 (1.0 Nm)
23	eShop	eShop	eShop	eShop	70	93	116	25	25	20	56	56	50	WOEX 040304	239700 6IP1 (1.0 Nm)
24	eShop	eShop	eShop	eShop	72	96	120	25	25	20	56	56	50	WOEX 040304	239700 6IP1 (1.0 Nm)
24,5	eShop	eShop	eShop	—	74	99	—	25	25	20	56	56	50	WOEX 040304	239700 6IP1 (1.0 Nm)
25	eShop	eShop	—	eShop	74	99	124	32	25	—	60	56	—	WOEX 05T304	239700 8IP (1.3 Nm)
26	eShop	eShop	—	eShop	76	102	128	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
26,5	eShop	eShop	—	—	78	105	—	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
27	eShop	eShop	—	eShop	78	105	132	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
28	eShop	eShop	—	eShop	80	108	136	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
29	eShop	eShop	—	eShop	82	111	140	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
29,5	—	eShop	—	—	—	114	—	—	32	—	—	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
30	eShop	eShop	—	eShop	89	119	149	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
31	eShop	eShop	—	eShop	91	122	153	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
32	eShop	eShop	—	eShop	93	125	157	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
33	eShop	eShop	—	eShop	95	128	161	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
34	eShop	eShop	—	eShop	97	131	165	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
35	eShop	eShop	—	eShop	99	134	169	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
36	eShop	eShop	—	eShop	101	137	173	32	32	—	60	60	—	WOEX 05T304	239700 8IP (1.3 Nm)
37	eShop	eShop	—	—	113	150	—	32	32	—	60	60	—	WOEX 06T304	239700 10IP (2.8 Nm)
38	eShop	eShop	—	—	115	153	—	32	32	—	60	60	—	WOEX 06T304	239700 10IP (2.8 Nm)
39	eShop	eShop	—	—	117	156	—	32	32	—	60	60	—	WOEX 06T304	239700 10IP (2.8 Nm)
39,5	—	eShop	—	—	—	159	—	—	32	—	—	60	—	WOEX 06T304	239700 10IP (2.8 Nm)
40	eShop	eShop	—	—	119	159	—	32	32	—	60	60	—	WOEX 06T304	239700 10IP (2.8 Nm)
41	eShop	eShop	—	—	121	162	—	32	32	—	60	60	—	WOEX 06T304	239700 10IP (2.8 Nm)
42	eShop	eShop	—	—	123	165	—	32	32	—	60	60	—	WOEX 06T304	239700 10IP (2.8 Nm)
43	eShop	eShop	—	—	125	168	—	32	32	—	60	60	—	WOEX 06T304	239700 10IP (2.8 Nm)
44	eShop	eShop	—	—	127	171	—	32	32	—	60	60	—	WOEX 06T304	239700 10IP (2.8 Nm)

MTC

Garant Indexable inserts WOEX.. for universal indexable drill MTC

Suitable for: GARANT indexable drills No. 232298; 232300; 232302; 232310.

Note:

23 2440/2540/2640/2740 – Do not use in the centre pocket of indexable drills!

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si								INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N					
HB 7305				275	275	215	125	125							175							
HB 7630				275	275	215									175							
HB 7635				275	275	215						165	165	80								
HB 330				275	275	275						165	165	80								
HU 7310	350	200	200																			
HB 7310	350	200	200																			
HB 7640				275	275	215						165	165	80		300	150					

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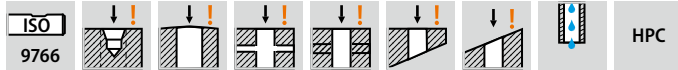
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Type			ALU	ST500	ST900	ST1400	INOX	GG	UNI	
21E 23 2400		HB7305	–	–	–	–	–	eShop	–	10
21E 23 2410	WOEX 030204 S	HB7630	–	–	–	eShop	–	–	–	10
21E 23 2420		HB7635	–	–	eShop	–	–	–	–	10
21E 23 2435	WOEX 030204 T	HB330	–	–	–	–	–	–	eShop	10
21E 23 2440	WOEX 030204 E	HB7635	–	eShop	–	–	–	–	–	10
21E 23 2450		HU7310	eShop	–	–	–	–	–	–	10
21E 23 2460	WOEX 030204 F	HB7310	eShop	–	–	–	–	–	–	10
21E 23 2470		HB7635	–	–	–	–	eShop	–	–	10
21E 23 2480	WOEX 030204 E	HB7640	–	–	–	–	eShop	–	–	10
f	mm/rev.		0.05	0.08	0.08	0.05	0.06	0.08	0.06	

Type			ALU	ST500	ST900	ST1400	INOX	GG	UNI	
21E 23 2500		HB7305	–	–	–	–	–	eShop	–	10
21E 23 2510	WOEX 040304 S	HB7630	–	–	–	eShop	–	–	–	10
21E 23 2520		HB7635	–	–	eShop	–	–	–	–	10
21E 23 2535	WOEX 040304 T	HB330	–	–	–	–	–	–	eShop	10
21E 23 2540	WOEX 040304 E	HB7635	–	eShop	–	–	–	–	–	10
21E 23 2550		HU7310	eShop	–	–	–	–	–	–	10
21E 23 2560	WOEX 040304 F	HB7310	eShop	–	–	–	–	–	–	10
21E 23 2570		HB7635	–	–	–	–	eShop	–	–	10
21E 23 2580	WOEX 040304 E	HB7640	–	–	–	–	eShop	–	–	10
f	mm/rev.		0.08	0.1	0.13	0.1	0.08	0.14	0.08	

Type			ALU	ST500	ST900	ST1400	INOX	GG	UNI	
21E 23 2600		HB7305	–	–	–	–	–	eShop	–	10
21E 23 2610	WOEX 05T304 S	HB7630	–	–	–	eShop	–	–	–	10
21E 23 2620		HB7635	–	–	eShop	–	–	–	–	10
21E 23 2635	WOEX 05T304 T	HB330	–	–	–	–	–	–	eShop	10
21E 23 2640	WOEX 05T304 E	HB7635	–	eShop	–	–	–	–	–	10
21E 23 2650		HU7310	eShop	–	–	–	–	–	–	10
21E 23 2660	WOEX 05T304 F	HB7310	eShop	–	–	–	–	–	–	10
21E 23 2670		HB7635	–	–	–	–	eShop	–	–	10
21E 23 2680	WOEX 05T304 E	HB7640	–	–	–	–	eShop	–	–	10
f	mm/rev.		0.1	0.12	0.14	0.1	0.12	0.2	0.1	

Type			ALU	ST500	ST900	ST1400	INOX	GG	UNI	
21E 23 2700		HB7305	–	–	–	–	–	eShop	–	10
21E 23 2710	WOEX 06T304 S	HB7630	–	–	–	eShop	–	–	–	10
21E 23 2720		HB7635	–	–	eShop	–	–	–	–	10
21E 23 2735	WOEX 06T304 T	HB330	–	–	–	–	–	–	eShop	10
21E 23 2740	WOEX 06T304 E	HB7635	–	eShop	–	–	–	–	–	10
21E 23 2750		HU7310	eShop	–	–	–	–	–	–	10
21E 23 2760	WOEX 06T304 F	HB7310	eShop	–	–	–	–	–	–	10
21E 23 2770		HB7635	–	–	–	–	eShop	–	–	10
21E 23 2780	WOEX 06T304 E	HB7640	–	–	–	–	eShop	–	–	10
f	mm/rev.		0.1	0.12	0.14	0.12	0.12	0.2	0.12	



Garant GARANT Power Drill indexable drill for right-hand cutting, plain shank with drive flats

The helical coolant ducts ensure very high stability, since they do not weaken the core of the drill.

23 4000/4005 – **Bore tolerance:** $-0.1 / +0.3$ mm

23 4010/4015 – **Bore tolerance:** $-0.1 / +0.35$ mm

Description: For maximum performance and dimensional accuracy.
Even for very difficult drilling situations up to 5xD.

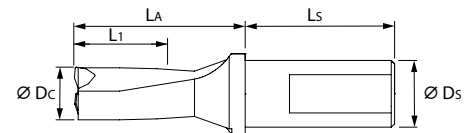
Recommendation:

23 4015 – **When spot-drilling** reduce the feed rate to 70%.

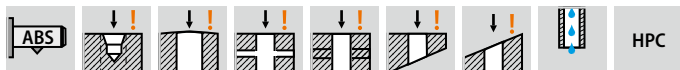
Note: Other intermediate sizes in 1/10 increments available on request.



23 4010



Ø D _c	215 23 4000	215 23 4005	215 23 4010	215 23 4015	for inch Ø	L _A				Ø D _s	L _s	ISO code indexable insert	Set of insert screws
GARANT Power Drill indexable drill													
Combination shank													
mm	2xD	3xD	4xD	5xD	in	23 4000	23 4005	23 4010	23 4015	mm	mm		
14	eShop	eShop	eShop	eShop	—	41	55	69	83	20	50	SOGX 050204	239700 5IP (0.38 Nm)
14,5	eShop	eShop	eShop	eShop	—	44	59	74	89	20	50	SOGX 050204	239700 5IP (0.38 Nm)
15	eShop	eShop	eShop	eShop	19/32	44	59	74	89	20	50	SOGX 050204	239700 5IP (0.38 Nm)
15,5	eShop	eShop	eShop	eShop	—	48	64	80	96	20	50	SOGX 050204	239700 5IP (0.38 Nm)
16	eShop	eShop	eShop	eShop	—	48	64	80	96	20	50	SOGX 050204	239700 5IP (0.38 Nm)
16,5	eShop	eShop	eShop	eShop	—	51	68	85	102	20	50	SOGX 060305	239700 6IP2 (0.6 Nm)
17	eShop	eShop	eShop	eShop	—	51	68	85	102	20	50	SOGX 060305	239700 6IP2 (0.6 Nm)
17,5	eShop	eShop	eShop	eShop	11/16	53	71	89	107	25	56	SOGX 060305	239700 6IP2 (0.6 Nm)
18	eShop	eShop	eShop	eShop	—	53	71	89	107	25	56	SOGX 060305	239700 6IP2 (0.6 Nm)
18,5	eShop	eShop	eShop	eShop	—	56	75	94	113	25	56	SOGX 060305	239700 6IP2 (0.6 Nm)
19	eShop	eShop	eShop	eShop	3/4	56	75	94	113	25	56	SOGX 060305	239700 6IP2 (0.6 Nm)
19,5	eShop	eShop	eShop	eShop	—	58	78	98	118	25	56	SOGX 070306	239700 6IP1 (1.0 Nm)
20	eShop	eShop	eShop	eShop	—	58	78	98	118	25	56	SOGX 070306	239700 6IP1 (1.0 Nm)
20,5	eShop	eShop	eShop	eShop	—	61	82	103	124	25	56	SOGX 070306	239700 6IP1 (1.0 Nm)
21	eShop	eShop	eShop	eShop	—	61	82	103	124	25	56	SOGX 070306	239700 6IP1 (1.0 Nm)
21,5	eShop	eShop	eShop	eShop	27/32	63	85	107	129	25	56	SOGX 070306	239700 6IP1 (1.0 Nm)
22	eShop	eShop	eShop	eShop	—	63	85	107	129	25	56	SOGX 070306	239700 6IP1 (1.0 Nm)
22,5	eShop	eShop	eShop	eShop	—	66	89	112	135	25	56	SOGX 070306	239700 6IP1 (1.0 Nm)
23	eShop	eShop	eShop	eShop	—	66	89	112	135	25	56	SOGX 080407	239700 8IP (1.3 Nm)
23,5	eShop	eShop	eShop	eShop	—	68	92	116	140	32	60	SOGX 080407	239700 8IP (1.3 Nm)
24	eShop	eShop	eShop	eShop	—	68	92	116	140	32	60	SOGX 080407	239700 8IP (1.3 Nm)
24,5	eShop	eShop	eShop	eShop	—	71	96	121	146	32	60	SOGX 080407	239700 8IP (1.3 Nm)
25	eShop	eShop	eShop	eShop	—	71	96	121	146	32	60	SOGX 080407	239700 8IP (1.3 Nm)
25,5	eShop	eShop	eShop	eShop	1	73	99	125	151	32	60	SOGX 080407	239700 8IP (1.3 Nm)
26	eShop	eShop	eShop	eShop	—	73	99	125	151	32	60	SOGX 080407	239700 8IP (1.3 Nm)
26,5	eShop	eShop	eShop	eShop	—	76	103	130	157	32	60	SOGX 080407	239700 8IP (1.3 Nm)
27	eShop	eShop	eShop	eShop	1 1/16	76	103	130	157	32	60	SOGX 100408	239700 10IP (2.8 Nm)
27,5	eShop	eShop	eShop	eShop	—	78	106	134	162	32	60	SOGX 100408	239700 10IP (2.8 Nm)
28	eShop	eShop	eShop	eShop	—	78	106	134	162	32	60	SOGX 100408	239700 10IP (2.8 Nm)
28,5	eShop	eShop	eShop	eShop	1 1/8	81	110	139	168	32	60	SOGX 100408	239700 10IP (2.8 Nm)
29	eShop	eShop	eShop	eShop	—	81	110	139	168	32	60	SOGX 100408	239700 10IP (2.8 Nm)
29,5	eShop	eShop	eShop	eShop	—	83	113	143	173	32	60	SOGX 100408	239700 10IP (2.8 Nm)
30	eShop	eShop	eShop	eShop	—	83	113	143	173	32	60	SOGX 100408	239700 10IP (2.8 Nm)
30,5	eShop	eShop	eShop	eShop	—	86	117	148	179	40	68	SOGX 100408	239700 10IP (2.8 Nm)
31	eShop	eShop	eShop	eShop	17/32	86	117	148	179	40	68	SOGX 100408	239700 10IP (2.8 Nm)
31,5	eShop	eShop	eShop	eShop	—	88	120	152	184	40	68	SOGX 100408	239700 10IP (2.8 Nm)
32	eShop	eShop	eShop	eShop	—	88	120	152	184	40	68	SOGX 110509	239700 15IP (2.8 Nm)
32,5	eShop	eShop	eShop	eShop	19/32	91	124	157	190	40	68	SOGX 110509	239700 15IP (2.8 Nm)
33	eShop	eShop	eShop	eShop	—	91	124	157	190	40	68	SOGX 110509	239700 15IP (2.8 Nm)
33,5	eShop	eShop	eShop	eShop	—	93	127	161	195	40	68	SOGX 110509	239700 15IP (2.8 Nm)
34	eShop	eShop	eShop	eShop	—	93	127	161	195	40	68	SOGX 110509	239700 15IP (2.8 Nm)
34,5	eShop	eShop	eShop	eShop	—	96	131	166	201	40	68	SOGX 110509	239700 15IP (2.8 Nm)
35	eShop	eShop	eShop	eShop	1 3/8	96	131	166	201	40	68	SOGX 110509	239700 15IP (2.8 Nm)
35,5	eShop	eShop	eShop	eShop	—	98	134	170	206	40	68	SOGX 110509	239700 15IP (2.8 Nm)
36	eShop	eShop	eShop	eShop	—	98	134	170	206	40	68	SOGX 110509	239700 15IP (2.8 Nm)
36,5	eShop	eShop	eShop	eShop	17/16	101	138	175	212	40	68	SOGX 110509	239700 15IP (2.8 Nm)
37	eShop	eShop	eShop	eShop	—	101	138	175	212	40	68	SOGX 110509	239700 15IP (2.8 Nm)
37,5	eShop	eShop	eShop	eShop	—	103	141	179	217	40	68	SOGX 130511	239700 20IP (6.3 Nm)
38	eShop	eShop	eShop	eShop	1 1/2	103	141	179	217	40	68	SOGX 130511	239700 20IP (6.3 Nm)
38,5	eShop	eShop	eShop	eShop	—	106	145	184	223	40	68	SOGX 130511	239700 20IP (6.3 Nm)
39	eShop	eShop	eShop	eShop	—	106	145	184	223	40	68	SOGX 130511	239700 20IP (6.3 Nm)
39,5	eShop	eShop	eShop	eShop	—	108	148	188	228	40	68	SOGX 130511	239700 20IP (6.3 Nm)
40	eShop	eShop	eShop	eShop	—	108	148	188	228	40	68	SOGX 130511	239700 20IP (6.3 Nm)
40,5	eShop	eShop	eShop	eShop	1 19/32	111	152	193	234	40	68	SOGX 130511	239700 20IP (6.3 Nm)
41	eShop	eShop	eShop	eShop	—	111	152	193	234	40	68	SOGX 130511	239700 20IP (6.3 Nm)
41,5	eShop	eShop	eShop	eShop	—	113	155	197	239	40	68	SOGX 130511	239700 20IP (6.3 Nm)
42	eShop	eShop	eShop	eShop	1 21/32	113	155	197	239	40	68	SOGX 130511	239700 20IP (6.3 Nm)
42,5	eShop	eShop	eShop	eShop	—	116	159	202	245	40	68	SOGX 130511	239700 20IP (6.3 Nm)
43	eShop	eShop	eShop	eShop	—	116	159	202	245	40	68	SOGX 130511	239700 20IP (6.3 Nm)
43,5	eShop	eShop	eShop	eShop	—	118	162	206	250	40	68	SOGX 130511	239700 20IP (6.3 Nm)
44	eShop	eShop	eShop	eShop	—	118	162	206	250	40	68	SOGX 130511	239700 20IP (6.3 Nm)



Garant GARANT Power Drill indexable drill for right-hand cutting, with ABS® shank

The helical coolant ducts ensure very high stability, since they do not weaken the core of the drill.

23 4020 – **Bore tolerance:** $-0.1 / +0.3$ mm

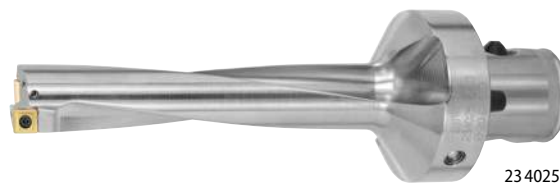
23 4025 – **Bore tolerance:** $-0.1 / +0.35$ mm

Description: For maximum performance and dimensional accuracy. Even for difficult drilling situations up to $5 \times D$.

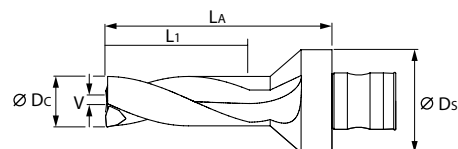
Application: With indexable inserts No. 234030 - 234098.

Recommendation:

23 4025 – **When spot-drilling** reduce the feed rate to 70%.



23 4025



$\varnothing D_c$	23 4020	23 4025	for inch $\varnothing$	L_A		ABS® $\varnothing D_s$	ISO code indexable insert	Set of insert screws
	GARANT Power Drill indexable drill			23 4020	23 4025			
	ABS® shank							
mm	3xD	5xD	in	mm	mm	mm		
14	eShop	eShop	—	69	97	50	SOGX 050204	239700 5IP (0.38 Nm)
15	eShop	eShop	19/32	73	103	50	SOGX 050204	239700 5IP (0.38 Nm)
16	eShop	eShop	—	78	110	50	SOGX 050204	239700 5IP (0.38 Nm)
17	eShop	eShop	—	82	116	50	SOGX 060305	239700 6IP2 (0.6 Nm)
17,5	eShop	eShop	11/16	85	121	50	SOGX 060305	239700 6IP2 (0.6 Nm)
18	eShop	eShop	—	85	121	50	SOGX 060305	239700 6IP2 (0.6 Nm)
19	eShop	eShop	3/4	89	127	50	SOGX 060305	239700 6IP2 (0.6 Nm)
20	eShop	eShop	—	92	132	50	SOGX 070306	239700 6IP1 (1.0 Nm)
21	eShop	eShop	—	95	137	50	SOGX 070306	239700 6IP1 (1.0 Nm)
22	eShop	eShop	—	98	142	50	SOGX 070306	239700 6IP1 (1.0 Nm)
23	eShop	eShop	—	101	147	50	SOGX 080407	239700 8IP (1.3 Nm)
24	eShop	eShop	—	104	152	50	SOGX 080407	239700 8IP (1.3 Nm)
25	eShop	eShop	—	108	158	50	SOGX 080407	239700 8IP (1.3 Nm)
26	eShop	eShop	—	111	163	50	SOGX 080407	239700 8IP (1.3 Nm)
30	eShop	eShop	—	125	185	50	SOGX 100408	239700 10IP (2.8 Nm)
32	eShop	eShop	—	135	199	63	SOGX 110509	239700 15IP (2.8 Nm)
35	eShop	eShop	1 3/8	146	216	63	SOGX 110509	239700 15IP (2.8 Nm)
40	eShop	eShop	—	163	243	63	SOGX 130511	239700 20IP (6.3 Nm)

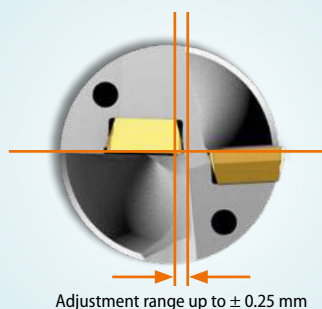
Garant Power Drill – the entire range



Now also with ABS shank, for more stable machining!

Individual adjustment range

The GARANT Power Drill has an adjustment range of up to ± 0.25 mm from the centre to cover various diameter ranges.



Adjustment range up to ± 0.25 mm

Scope of range:

- Diameter range: 14 – 40 mm
- Length ratio 3xD and 5xD
- ABS50 up to diameter 30 mm
- ABS63 up to diameter 50 mm



Close bore tolerances:

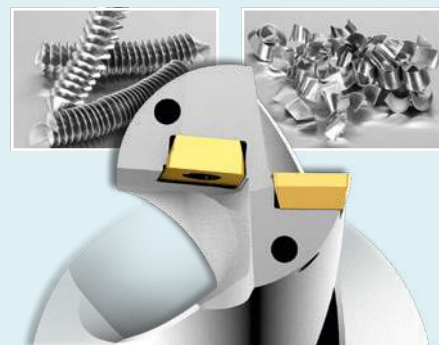
- 3xD drill: $-0.1 / +0.3$ mm
- 5xD drill: $-0.1 / +0.35$ mm

Choice of insert

Suitable inserts and sizes are available for the different machining challenges.

Chip evacuation

Due to the larger flutes and the positioning of the cooling channels at the edges of the drill, chip evacuation and stability are significantly increased.



Excellently formed chips for good chip evacuation.

Garant GARANT Power Drill indexable inserts SOGX.. for indexable drill
Suitable for: GARANT Power Drill No. 234000 – 234025.

Recommendation: When spot drilling with holder No. 234015 and No. 234025, reduce the feed rate to 70%.

Note:

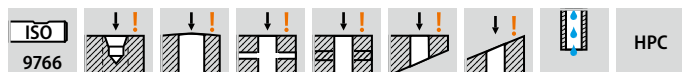
23 4034/4037/4044/4054/4057/4064/4067/4074/4077/4084/4087/4094/4097 –

Not for use as an internal cutter (it is essential that an internal cutter be of material grade HB630).

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
HB 6810	500	300	220																			
HB 6535				270	250								170	150								
HB 6530						220	180	160														
HB 6640													180	160	75							
HB 6715																200						
HB 630				260	240	210	170	140					160	140		140						



Type		ALU	ST900	ST1400	INOX	GG	UNI		f mm/rev.
21E 23 4030	SOGX 050204	HB6810	eShop	–	–	–	–	10	0.06 – 0.18
21E 23 4032		HB6535	–	eShop	–	–	eShop	10	0.05 – 0.1
21E 23 4034		HB6530	–	–	eShop	–	–	10	0.06 – 0.12
21E 23 4036		HB6640	–	–	–	eShop	–	10	0.05 – 0.1
21E 23 4037		HB6715	–	–	–	–	eShop	10	0.04 – 0.18
21E 23 4038		HB630	–	–	–	–	eShop	10	0.04 – 0.16
21E 23 4040	SOGX 060305	HB6810	eShop	–	–	–	–	10	0.06 – 0.18
21E 23 4042		HB6535	–	eShop	–	–	eShop	10	0.06 – 0.12
21E 23 4044		HB6530	–	–	eShop	–	–	10	0.06 – 0.12
21E 23 4046		HB6640	–	–	–	eShop	–	10	0.05 – 0.1
21E 23 4047		HB6715	–	–	–	–	eShop	10	0.05 – 0.18
21E 23 4048		HB630	–	–	–	–	eShop	10	0.05 – 0.16
21E 23 4050	SOGX 070306	HB6810	eShop	–	–	–	–	10	0.06 – 0.21
21E 23 4052		HB6535	–	eShop	–	–	eShop	10	0.08 – 0.14
21E 23 4054		HB6530	–	–	eShop	–	–	10	0.08 – 0.14
21E 23 4056		HB6640	–	–	–	eShop	–	10	0.06 – 0.12
21E 23 4057		HB6715	–	–	–	–	eShop	10	0.05 – 0.22
21E 23 4058		HB630	–	–	–	–	eShop	10	0.05 – 0.2
21E 23 4060	SOGX 080407	HB6810	eShop	–	–	–	–	10	0.08 – 0.21
21E 23 4062		HB6535	–	eShop	–	–	eShop	10	0.08 – 0.16
21E 23 4064		HB6530	–	–	eShop	–	–	10	0.08 – 0.16
21E 23 4066		HB6640	–	–	–	eShop	–	10	0.07 – 0.14
21E 23 4067		HB6715	–	–	–	–	eShop	10	0.09 – 0.28
21E 23 4068		HB630	–	–	–	–	eShop	10	0.07 – 0.2
21E 23 4070	SOGX 100408	HB6810	eShop	–	–	–	–	10	0.08 – 0.21
21E 23 4072		HB6535	–	eShop	–	–	eShop	10	0.08 – 0.16
21E 23 4074		HB6530	–	–	eShop	–	–	10	0.08 – 0.16
21E 23 4076		HB6640	–	–	–	eShop	–	10	0.07 – 0.14
21E 23 4077		HB6715	–	–	–	–	eShop	10	0.13 – 0.3
21E 23 4078		HB630	–	–	–	–	eShop	10	0.07 – 0.2
21E 23 4080	SOGX 110509	HB6810	eShop	–	–	–	–	10	0.08 – 0.21
21E 23 4082		HB6535	–	eShop	–	–	eShop	10	0.08 – 0.18
21E 23 4084		HB6530	–	–	eShop	–	–	10	0.08 – 0.18
21E 23 4086		HB6640	–	–	–	eShop	–	10	0.07 – 0.16
21E 23 4087		HB6715	–	–	–	–	eShop	10	0.13 – 0.3
21E 23 4088		HB630	–	–	–	–	eShop	10	0.08 – 0.2
21E 23 4090	SOGX 130511	HB6810	eShop	–	–	–	–	10	0.08 – 0.21
21E 23 4092		HB6535	–	eShop	–	–	eShop	10	0.09 – 0.2
21E 23 4094		HB6530	–	–	eShop	–	–	10	0.09 – 0.2
21E 23 4096		HB6640	–	–	–	eShop	–	10	0.08 – 0.18
21E 23 4097		HB6715	–	–	–	–	eShop	10	0.13 – 0.3
21E 23 4098		HB630	–	–	–	–	eShop	10	0.08 – 0.2



HOLEX Pro Drill indexable drill for right-hand cutting, plain shank with drive flat

HOLEX Pro Drill indexable drills combine cost efficiency with technically fully developed capability.

For use up to 4xD in challenging drilling applications.

23 5010 – **Bore tolerance:** -0.05 / +0.3 mm

23 5000/5005 – **Bore tolerance:** -0.1 / +0.25 mm

Application: With indexable inserts No. 235030 – 235082.

Both SOMT inserts for the outer insert seat and also XOMT inserts for the inner insert seat are required.

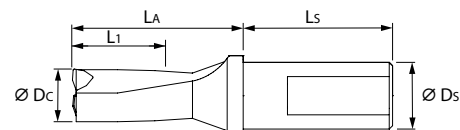
Supplied with: With insert screws (supplied without indexable inserts).

Recommendation:

23 5010 – When spot-drilling reduce the feed rate to 70%.

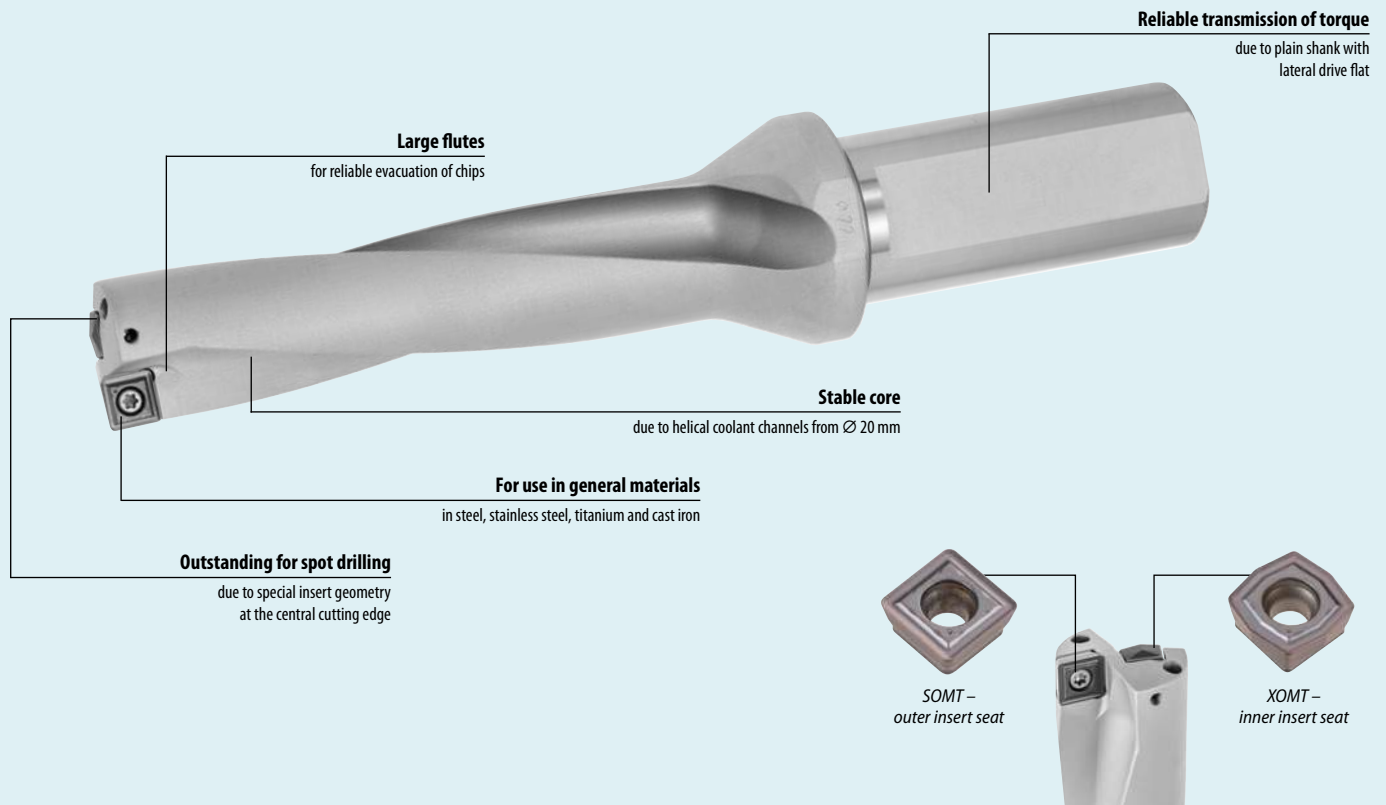


23 5010



Ø D _c	22L 23 5000	22L 23 5005	22L 23 5010	for inch Ø	L _A			Ø D _s	L ₂	ISO code indexable insert	Set of insert screws
HOLEX Pro Drill indexable drill											
Combination shank											
mm	2xD	3xD	4xD	in	23 5000 mm	23 5005 mm	23 5010 mm	mm	mm		
14	eShop	eShop	eShop	–	46	60	74	20	50	SOMT05T204 / XOMT05T204	232980 1 (TX6;0.4Nm)
15	eShop	eShop	eShop	19/32	49	64	79	20	50	SOMT05T204 / XOMT05T204	232980 1 (TX6;0.4Nm)
16	eShop	eShop	eShop	–	51	67	83	20	50	SOMT05T204 / XOMT05T204	232980 1 (TX6;0.4Nm)
17	eShop	eShop	eShop	–	53	70	87	25	56	SOMT06T205 / XOMT06T204	232980 2 (TX7;0.8Nm)
17,5	–	eShop	eShop	11/16	–	70	87	25	56	SOMT06T205 / XOMT06T204	232980 2 (TX7;0.8Nm)
18	eShop	eShop	eShop	–	56	74	92	25	56	SOMT06T205 / XOMT06T204	232980 2 (TX7;0.8Nm)
18,5	eShop	eShop	eShop	–	56	74	92	25	56	SOMT06T205 / XOMT06T204	232980 2 (TX7;0.8Nm)
19	eShop	eShop	eShop	3/4	58	77	96	25	56	SOMT06T205 / XOMT06T204	232980 2 (TX7;0.8Nm)
19,5	–	eShop	eShop	–	–	77	96	25	56	SOMT06T205 / XOMT06T204	232980 2 (TX7;0.8Nm)
20	eShop	eShop	eShop	–	62	82	102	25	56	SOMT070308 / XOMT070305	232980 3 (TX7; 0.8Nm)
21	eShop	eShop	eShop	–	64	85	106	25	56	SOMT070308 / XOMT070305	232980 3 (TX7; 0.8Nm)
22	eShop	eShop	eShop	–	66	88	110	25	56	SOMT070308 / XOMT070305	232980 3 (TX7; 0.8Nm)
22,5	–	eShop	eShop	–	–	88	110	25	56	SOMT070308 / XOMT070305	232980 3 (TX7; 0.8Nm)
23	eShop	eShop	eShop	–	70	93	116	25	56	SOMT070308 / XOMT070305	232980 3 (TX7; 0.8Nm)
24	eShop	eShop	eShop	–	73	97	121	32	60	SOMT093608 / XOMT093605	232980 4 (TX9;1.2Nm)
24,5	eShop	eShop	eShop	–	73	97	121	32	60	SOMT093608 / XOMT093605	232980 4 (TX9;1.2Nm)
25	eShop	eShop	eShop	–	75	100	125	32	60	SOMT093608 / XOMT093605	232980 4 (TX9;1.2Nm)
26	eShop	eShop	eShop	–	77	103	129	32	60	SOMT093608 / XOMT093605	232980 4 (TX9;1.2Nm)
26,5	eShop	eShop	eShop	–	77	103	129	32	60	SOMT093608 / XOMT093605	232980 4 (TX9;1.2Nm)
27	eShop	eShop	eShop	11/16	80	107	134	32	60	SOMT093608 / XOMT093605	232980 4 (TX9;1.2Nm)
28	eShop	eShop	eShop	–	83	111	139	32	60	SOMT093608 / XOMT093605	232980 4 (TX9;1.2Nm)
29	eShop	eShop	eShop	–	85	114	143	32	60	SOMT093608 / XOMT093605	232980 4 (TX9;1.2Nm)
29,5	–	eShop	eShop	–	–	114	143	32	60	SOMT093608 / XOMT093605	232980 4 (TX9;1.2Nm)
30	eShop	eShop	eShop	–	90	120	150	32	60	SOMT110408 / XOMT110406	232980 5 (TX15;3Nm)
31	eShop	eShop	eShop	1 7/32	92	123	154	32	60	SOMT110408 / XOMT110406	232980 5 (TX15;3Nm)
32	eShop	eShop	eShop	–	94	126	158	32	60	SOMT110408 / XOMT110406	232980 5 (TX15;3Nm)
33	eShop	eShop	eShop	–	97	130	163	32	60	SOMT110408 / XOMT110406	232980 5 (TX15;3Nm)
34	eShop	eShop	eShop	–	99	133	167	32	60	SOMT110408 / XOMT110406	232980 5 (TX15;3Nm)
35	eShop	eShop	eShop	1 3/8	101	136	171	32	60	SOMT110408 / XOMT110406	232980 5 (TX15;3Nm)
36	eShop	eShop	eShop	–	106	142	178	40	70	SOMT13M510 / XOMT13M506	232980 6 (TX15;3Nm)
37	eShop	eShop	eShop	–	108	145	182	40	70	SOMT13M510 / XOMT13M506	232980 6 (TX15;3Nm)
38	eShop	eShop	eShop	1 1/2	111	149	187	40	70	SOMT13M510 / XOMT13M506	232980 6 (TX15;3Nm)
39	eShop	eShop	eShop	–	113	152	191	40	70	SOMT13M510 / XOMT13M506	232980 6 (TX15;3Nm)
39,5	–	eShop	eShop	–	–	152	191	40	70	SOMT13M510 / XOMT13M506	232980 6 (TX15;3Nm)
40	eShop	eShop	eShop	–	116	156	196	40	70	SOMT13M510 / XOMT13M506	232980 6 (TX15;3Nm)

HOLEX Pro Drill – indexable drill

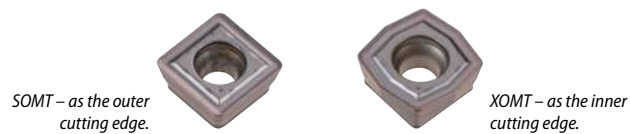
Robust. Reliable. Economical.

HOLEX Pro Drill indexable inserts SOMT.... / XOMT..... for indexable drills

The central cutting edge centres the drill quickly and reliably. The outer cutting edge offers outstanding chip clearance.

Suitable for: HOLEX Pro Drill No. 235000 – 235010.

Application: SOMT inserts exclusively as the outer cutting edges. XOMT inserts exclusively as the centre cutting edge.

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
23 5030–23 5082				160	150	140	120	100				110	90	50	130	220	●		●			



Type				UNI		 f < 900 N
22K	23 5030	SOMT05T204	HBD30	eShop	10	0.05 – 0.1
22K	23 5032	XOMT05T204	HBD30	eShop	10	0.05 – 0.1
22K	23 5040	SOMT06T205	HBD30	eShop	10	0.06 – 0.12
22K	23 5042	XOMT06T204	HBD30	eShop	10	0.06 – 0.12
22K	23 5050	SOMT070308	HBD30	eShop	10	0.06 – 0.12
22K	23 5052	XOMT070305	HBD30	eShop	10	0.06 – 0.12
22K	23 5060	SOMT093608	HBD30	eShop	10	0.06 – 0.14
22K	23 5062	XOMT093605	HBD30	eShop	10	0.06 – 0.14
22K	23 5070	SOMT110408	HBD30	eShop	10	0.06 – 0.16
22K	23 5072	XOMT110406	HBD30	eShop	10	0.06 – 0.16
22K	23 5080	SOMT13M510	HBD30	eShop	10	0.06 – 0.16
22K	23 5082	XOMT13M506	HBD30	eShop	10	0.06 – 0.16

KOMET Indexable inserts SOEX.. Type W83 for KUB Quatron® / TwinKom® G01 / KUB Centron® Powerline

Ground on the circumference, with rounded cutting edge and sintered chip breaker.

Note: Application values refer to the KUB Quatron®.

23 6535 – When using the KUB Quatron® please halve the feed rate values.

Size 39-210 – **Only for KUB Centron Powerline.**

23 6553–6560 – **Do not use in the centre pocket of indexable drills!**

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
23 6520	600	300	250	300	250	200	160	130				160	160	80	200			●		●			
23 6535–23 6537				300	250	200	160	130				160	160						●		●		
23 6541	600	300	250	300	250	200	160	130				160	160	80				●		●			
23 6553				300	250	200						160	160	80					●		●		
23 6554	600	300	250											80		300	150			●			○
23 6560							160	130	60						200					●			○
23 6573				300	250	200	160	130				160	160	80						●			
23 6576				300	250	200						160	160	80						●			



Designation type W83			13-000	13-010	13-030	13-130	13-210		Type
24Q 23 6520	KOMET® indexable insert	BK8425	–	eShop	–	–	–	–	Uni
24Q 23 6535		BK8430	–	–	eShop	–	–	–	ST1400
24Q 23 6537		BK8430	–	–	–	–	eShop	–	ST1400
24Q 23 6541		BK7935	–	eShop	–	–	–	–	ST900; Ti
24Q 23 6553		BK7935	–	–	–	–	eShop	–	Inox
24Q 23 6554		BK7710	–	–	–	–	(eShop)	–	Alu
24Q 23 6560		BK6115	eShop	–	–	–	–	–	GG(G)
24Q 23 6573		BK8425	–	–	–	eShop	–	–	ST1400
24Q 23 6576		BK7935	–	–	–	eShop	–	–	Inox
ISO code indexable insert			SOEX 050204						
Feed f in steel < 900 N/mm² mm/rev.			0.12						

Designation type W83			18-000	18-010	18-030	18-130	18-210		Type
 23 6520	KOMET® indexable insert	BK8425	–	eShop	–	–	–	–	Uni
 23 6535		BK8430	–	–	eShop	–	–	–	ST1400
 23 6537		BK8430	–	–	–	–	eShop	–	ST1400
 23 6541		BK7935	–	eShop	–	–	–	–	ST900; Ti
 23 6553		BK7935	–	–	–	–	eShop	–	Inox
 23 6554		BK7710	–	–	–	–	(eShop)	–	Alu
 23 6560		BK6115	eShop	–	–	–	–	–	GG(G)
 23 6573		BK8425	–	–	–	eShop	–	–	ST1400
 23 6576		BK7935	–	–	–	eShop	–	–	Inox
ISO code indexable insert			SOEX 060306						
Feed f in steel < 900 N/mm²			mm/rev. 0.16						



Designation type W83			23-000	23-010	23-030	23-130	23-210		Type
24Q 23 6520	KOMET® indexable insert	BK8425	—	eShop	—	—	—	—	Uni
24Q 23 6535		BK8430	—	—	eShop	—	—	—	ST1400
24Q 23 6537		BK8430	—	—	—	—	eShop	—	ST1400
24Q 23 6541		BK7935	—	eShop	—	—	—	—	ST900;Ti
24Q 23 6553		BK7935	—	—	—	—	eShop	—	Inox
24Q 23 6554		BK7710	—	—	—	—	(eShop)	—	Alu
24Q 23 6560		BK6115	eShop	—	—	—	—	—	GG(G)
24Q 23 6573		BK8425	—	—	—	eShop	—	—	ST1400
24Q 23 6576		BK7935	—	—	—	eShop	—	—	Inox
ISO code indexable insert			SOEX 07T308						
Feed f in steel < 900 N/mm² mm/rev.			0.16						

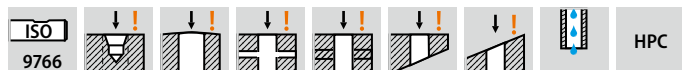
Designation type W83			32-000	32-010	32-030	32-130	32-210		Type
24Q 23 6520	KOMET® indexable insert	BK8425	—	eShop	—	—	—	—	Uni
24Q 23 6535		BK8430	—	—	eShop	—	—	—	ST1400
24Q 23 6537		BK8430	—	—	—	—	eShop	—	ST1400
24Q 23 6541		BK7935	—	eShop	—	—	—	—	ST900; Ti
24Q 23 6553		BK7935	—	—	—	—	eShop	—	Inox
24Q 23 6554		BK7710	—	—	—	—	(eShop)	—	Alu
24Q 23 6560		BK6115	eShop	—	—	—	—	—	GG(G)
24Q 23 6573		BK8425	—	—	—	eShop	—	—	ST1400
24Q 23 6576		BK7935	—	—	—	eShop	—	—	Inox
ISO code indexable insert			SOEX 090408						
Feed f in steel < 900 N/mm²			mm/rev. 0.2						

Designation type W83			39-210		Type
^{24Q} 23 6537	KOMET® indexable insert	BK8430	eShop	—	ST1400
^{24Q} 23 6553		BK7935	eShop	—	Inox
ISO code indexable insert			SOEX 110508		
Feed f in steel < 900 N/mm²		mm/rev.	0.22		

Designation type W83			44-000	44-010	44-030	44-130	44-210		Type
24Q 23 6520	KOMET® indexable insert	BK8425	—	eShop	—	—	—	—	Uni
24Q 23 6535		BK8430	—	—	eShop	—	—	—	ST1400
24Q 23 6537		BK8430	—	—	—	—	eShop	—	ST1400
24Q 23 6541		BK7935	—	eShop	—	—	—	—	ST900; Ti
24Q 23 6553		BK7935	—	—	—	—	eShop	—	Inox
24Q 23 6554		BK7710	—	—	—	—	(eShop)	—	Alu
24Q 23 6560		BK6115	eShop	—	—	—	—	—	GG(G)
24Q 23 6573		BK8425	—	—	—	eShop	—	—	ST1400
24Q 23 6576		BK7935	—	—	—	eShop	—	—	Inox
ISO code indexable insert			SOEX 120508						
Feed f in steel < 900 N/mm²			mm/rev. 0.25						



23



KOMET HPC indexable drill KUB Pentron® right-hand cutting, plain shank with drive flats

- **Very high performance** and long tool life thanks to optimised base body strength and special surface treatment.
- Best dimensional accuracy under **very difficult drilling conditions**.
- Stock costs reduced because internal and external inserts are identical.
- Offset-axis drilling is possible up to $V_{max} = 0.25$ mm. Maximum $\varnothing = D + 0.5$ mm achievable by offsetting.

23 6601 – **Bore tolerance:** $\varnothing D - 0.1 / + 0.3$

23 6602 – **Bore tolerance:** $\varnothing D - 0.1 / + 0.35$

23 6614/6615 – **Bore tolerance:** $\varnothing D - 0.1 / + 0.2$

Application: ■ **Under extreme machining conditions.**

With indexable inserts No. 236605 – 236610.

Supplied with: Clamp screws (without indexable inserts).

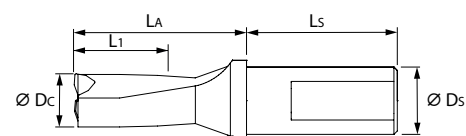
Recommendation:

23 6602 – **When spot-drilling** reduce the feed rate by 70 %.

Note: Version 2xD and 3xD with ABS* also available on request in imperial sizes. Version with PSC shank available on request.



23 6602

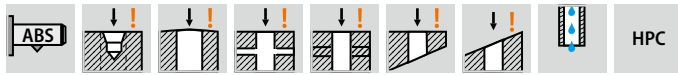


$\varnothing D_c$	24P 23 6614	24P 23 6615	24P 23 6601	24P 23 6602	for inch $\varnothing$	L_A				$\varnothing D_s$	L_s	ISO code indexable insert	Set of insert screws
KUB Pentron® indexable drill													
Plain shank						23 6614	23 6615	23 6601	23 6602				
mm	2xD	3xD	4xD	5xD	in	mm	mm	mm	mm	mm	mm		
14	(eShop)	(eShop)	eShop	(eShop)	—	41	55	69	83	20	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)
14,3	(eShop)	(eShop)	—	—	—	44	59	—	—	20	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)
14,5	eShop	(eShop)	(eShop)	(eShop)	—	44	59	74	89	20	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)
15	(eShop)	(eShop)	(eShop)	(eShop)	19/32	44	59	74	89	20	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)
15,1	(eShop)	(eShop)	—	—	—	48	64	—	—	20	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)
15,5	eShop	eShop	(eShop)	(eShop)	—	48	64	80	96	20	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)
15,9	(eShop)	(eShop)	—	—	—	48	64	—	—	20	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)
16	(eShop)	eShop	(eShop)	(eShop)	—	48	64	80	96	20	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)
16,5	(eShop)	(eShop)	(eShop)	(eShop)	—	51	68	85	102	20	50	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)
16,7	(eShop)	(eShop)	—	—	—	51	68	—	—	20	50	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)
17	(eShop)	(eShop)	(eShop)	(eShop)	—	51	68	85	102	20	50	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)
17,5	(eShop)	(eShop)	eShop	(eShop)	11/16	53	71	89	107	25	56	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)
17,9	(eShop)	(eShop)	—	—	—	53	71	—	—	25	56	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)
18	(eShop)	(eShop)	eShop	eShop	—	53	71	89	107	25	56	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)
18,5	(eShop)	(eShop)	(eShop)	(eShop)	—	56	75	94	113	25	56	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)
19	(eShop)	eShop	(eShop)	(eShop)	3/4	56	75	94	113	25	56	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)
19,1	(eShop)	(eShop)	—	—	—	58	78	—	—	25	56	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)
19,4	(eShop)	(eShop)	—	—	—	58	78	—	—	25	56	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)
19,5	eShop	(eShop)	(eShop)	(eShop)	—	58	78	98	118	25	56	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)
19,8	(eShop)	(eShop)	—	—	—	58	78	—	—	25	56	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)
20	(eShop)	eShop	(eShop)	eShop	—	58	78	98	118	25	56	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)
20,5	(eShop)	(eShop)	(eShop)	(eShop)	—	61	82	103	124	25	56	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)
21	(eShop)	(eShop)	(eShop)	eShop	—	63	82	103	124	25	56	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)
21,5	(eShop)	(eShop)	(eShop)	(eShop)	27/32	63	85	107	129	25	56	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)
21,6	(eShop)	(eShop)	—	—	—	63	85	—	—	25	56	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)
22	(eShop)	eShop	(eShop)	(eShop)	—	63	85	107	129	25	56	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)
22,2	(eShop)	(eShop)	—	—	—	66	89	—	—	25	56	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)
22,5	(eShop)	eShop	(eShop)	(eShop)	—	66	89	112	135	25	56	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)
23	(eShop)	(eShop)	(eShop)	(eShop)	29/32	66	89	112	135	25	56	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)
23,5	eShop	(eShop)	(eShop)	(eShop)	—	68	92	116	140	32	60	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)
23,8	(eShop)	(eShop)	—	—	—	68	92	—	—	32	60	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)
24	(eShop)	(eShop)	(eShop)	(eShop)	—	68	92	116	140	32	60	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)
24,5	(eShop)	(eShop)	(eShop)	eShop	—	71	96	121	146	32	60	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)
25	(eShop)	(eShop)	(eShop)	(eShop)	—	71	96	121	146	32	60	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)

Ø D _c	24P 23 6614	24P 23 6615	24P 23 6601	24P 23 6602	for inch Ø	L _A				Ø D _s	L _s	ISO code indexable insert	Set of insert screws
KUB Pentron® indexable drill													
Plain shank													
mm	2×D	3×D	4×D	5×D	in	mm	mm	mm	mm	mm	mm		
25,4	(eShop)	(eShop)	—	—	—	73	99	—	—	32	60	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)
25,5	(eShop)	(eShop)	(eShop)	(eShop)	1	73	99	125	151	32	60	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)
26	(eShop)	(eShop)	(eShop)	(eShop)	—	73	99	125	151	32	60	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)
26,2	(eShop)	(eShop)	—	—	—	76	103	—	—	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
26,5	(eShop)	(eShop)	(eShop)	(eShop)	—	76	103	130	157	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
27	(eShop)	(eShop)	(eShop)	(eShop)	1 1/16	76	103	130	157	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
27,5	(eShop)	(eShop)	(eShop)	(eShop)	—	78	106	134	162	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
28	(eShop)	(eShop)	(eShop)	(eShop)	—	78	106	134	162	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
28,2	(eShop)	(eShop)	—	—	—	81	110	—	—	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
28,5	(eShop)	(eShop)	(eShop)	(eShop)	1 1/8	81	110	139	168	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
28,6	(eShop)	(eShop)	—	—	—	81	110	—	—	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
29	eShop	(eShop)	(eShop)	(eShop)	—	81	110	139	168	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
29,4	(eShop)	(eShop)	—	—	—	83	113	—	—	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
29,5	(eShop)	(eShop)	(eShop)	(eShop)	—	83	113	143	173	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
30	(eShop)	(eShop)	(eShop)	(eShop)	—	83	113	143	173	32	60	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)
30,2	(eShop)	(eShop)	—	—	—	86	117	—	—	40	68	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)
30,5	(eShop)	(eShop)	(eShop)	(eShop)	—	86	117	148	179	40	68	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)
30,9	(eShop)	(eShop)	—	—	—	86	117	—	—	40	68	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)
31	(eShop)	(eShop)	(eShop)	(eShop)	1 7/32	86	117	148	179	40	68	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)
31,5	eShop	(eShop)	(eShop)	(eShop)	—	88	120	152	184	40	68	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)
31,8	(eShop)	(eShop)	—	—	—	88	120	—	—	40	68	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)
32	(eShop)	(eShop)	(eShop)	(eShop)	—	88	120	152	184	40	68	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)
32,5	eShop	(eShop)	(eShop)	(eShop)	1 9/32	91	124	157	190	40	68	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)
33	(eShop)	(eShop)	(eShop)	(eShop)	—	91	124	157	190	40	68	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)
33,2	eShop	eShop	eShop	eShop	—	93	127	161	195	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
33,3	(eShop)	(eShop)	—	—	—	93	127	—	—	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
33,5	eShop	(eShop)	(eShop)	eShop	—	93	127	161	195	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
33,7	(eShop)	(eShop)	—	—	—	93	127	—	—	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
34	(eShop)	(eShop)	(eShop)	(eShop)	—	93	127	161	195	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
34,5	eShop	eShop	(eShop)	(eShop)	—	96	131	166	201	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
34,9	(eShop)	(eShop)	—	—	—	96	131	—	—	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
35	(eShop)	(eShop)	(eShop)	(eShop)	1 3/8	96	131	166	201	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
35,5	eShop	eShop	(eShop)	(eShop)	—	98	134	170	206	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
36	eShop	(eShop)	(eShop)	(eShop)	—	98	134	170	206	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
36,5	(eShop)	eShop	(eShop)	eShop	1 7/16	101	138	175	212	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
37	(eShop)	(eShop)	(eShop)	(eShop)	—	101	138	175	212	40	68	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)
37,3	(eShop)	(eShop)	—	—	—	103	141	—	—	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
37,5	(eShop)	eShop	(eShop)	(eShop)	—	103	141	179	217	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
38	(eShop)	(eShop)	(eShop)	(eShop)	1 1/2	103	141	179	217	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
38,1	(eShop)	(eShop)	—	—	—	106	145	—	—	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
38,5	eShop	(eShop)	eShop	(eShop)	—	106	145	184	223	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
39	eShop	(eShop)	(eShop)	(eShop)	—	106	145	184	223	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
39,2	(eShop)	eShop	eShop	eShop	—	108	148	188	228	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
39,5	(eShop)	(eShop)	(eShop)	(eShop)	—	108	148	188	228	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
39,7	(eShop)	(eShop)	—	—	—	108	148	—	—	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
40	(eShop)	(eShop)	(eShop)	(eShop)	—	108	148	188	228	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
40,5	eShop	(eShop)	(eShop)	(eShop)	1 19/32	111	152	193	234	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
41	(eShop)	eShop	(eShop)	(eShop)	—	111	152	193	234	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
41,3	(eShop)	(eShop)	—	—	—	113	155	—	—	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
41,5	(eShop)	(eShop)	(eShop)	(eShop)	—	113	155	197	239	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
42	eShop	(eShop)	(eShop)	(eShop)	1 21/32	113	155	197	239	40	68	SOGX 120408 42-...	239652 20IP (6.3 Nm)
42,1	(eShop)	(eShop)	—	—	—	116	159	—	—	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)
42,5	eShop	eShop	eShop	eShop	—	116	159	202	245	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)
42,9	(eShop)	(eShop)	—	—	—	116	159	—	—	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)
43	eShop	(eShop)	(eShop)	(eShop)	—	116	159	202	245	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)
43,5	(eShop)	(eShop)	(eShop)	(eShop)	—	118	162	206	250	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)
44	eShop	eShop	(eShop)	(eShop)	—	118	162	206	250	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)
44,5	(eShop)	(eShop)	(eShop)	(eShop)	1 3/4	121	166	211	256	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)
45	(eShop)	(eShop)	(eShop)	(eShop)	—	121	166	211	256	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)
45,5	eShop	(eShop)	(eShop)	(eShop)	—	123	169	215	261	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)
46	(eShop)	(eShop)	(eShop)	(eShop)	1 13/16	123	169	215	261	40	68	SOGX 130508 46-...	239652 20IP (6.3 Nm)



23



KOMET KUB Pentron® indexable drill right-hand cutting, with ABS® shank

23 6603 – Bore tolerance: $D - 0.1 / + 0.3$

23 6604 – Bore tolerance: $D - 0.1 / + 0.35$

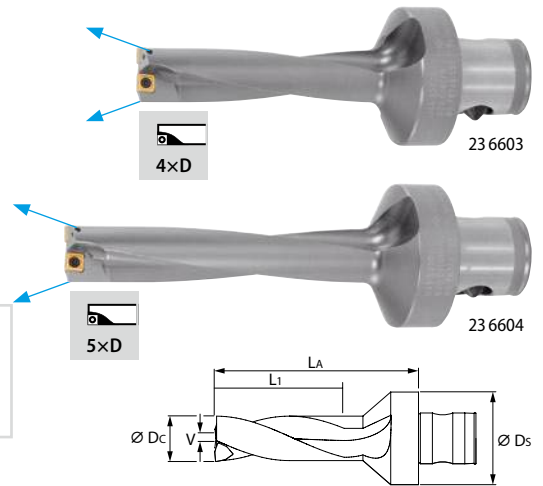
Application: With indexable inserts No. 236605 – 236610.

Recommendation:

23 6604 – When spot-drilling reduce the feed rate to 70%.

Note:

- For use only under **stable** machining conditions.
- Version 2xD and 3xD with ABS® shank available on request.
- **Offset-axis drilling up to $V_{\max} = 0.25$ mm.**
- Maximum $\varnothing = D + 0.5$ mm achievable by offsetting.
- Version with PSC shank available on request.



Ø D _c	23 6603		23 6604	for inch Ø	L _A		ABS® Ø D _s	ISO code indexable insert	Set of insert screws
	KUB Pentron® indexable drill ABS® shank				23 6603	23 6604			
mm	4xD	5xD	in	mm	mm	mm			
14	(eShop)	(eShop)	—	83	97	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)	
14,5	(eShop)	(eShop)	—	88	103	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)	
15	(eShop)	(eShop)	19/32	88	103	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)	
15,5	(eShop)	(eShop)	—	94	110	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)	
16	(eShop)	(eShop)	—	94	110	50	SOGX 040204 10-...	239652 5IP1 (0.38 Nm)	
16,5	(eShop)	(eShop)	—	99	116	50	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)	
17	(eShop)	(eShop)	—	99	116	50	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)	
17,5	(eShop)	eShop	11/16	103	121	50	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)	
18	(eShop)	(eShop)	—	103	121	50	SOGX 050204 12-...	239652 6IP1 (0.6 Nm)	
18,5	(eShop)	(eShop)	—	108	127	50	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)	
19	(eShop)	(eShop)	3/4	108	127	50	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)	
19,5	(eShop)	(eShop)	—	112	132	50	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)	
20	(eShop)	(eShop)	—	112	132	50	SOGX 060206 18-...	239652 6IP2 (1.0 Nm)	
20,5	(eShop)	(eShop)	—	116	137	50	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)	
21	(eShop)	eShop	—	116	137	50	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)	
21,5	eShop	(eShop)	27/32	120	142	50	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)	
22	(eShop)	eShop	—	120	142	50	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)	
22,5	(eShop)	(eShop)	—	124	147	50	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)	
23	(eShop)	(eShop)	29/32	124	147	50	SOGX 07T208 20-...	239652 6IP2 (1.0 Nm)	
23,5	(eShop)	(eShop)	—	128	152	50	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)	
24	(eShop)	(eShop)	—	128	152	50	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)	
24,5	(eShop)	(eShop)	—	133	158	50	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)	
25	(eShop)	(eShop)	—	133	158	50	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)	
25,5	(eShop)	(eShop)	1	137	163	50	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)	
26	(eShop)	eShop	—	137	163	50	SOGX 080308 24-...	239652 8IP1 (1.3 Nm)	
26,5	(eShop)	(eShop)	—	142	169	50	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)	
27	(eShop)	(eShop)	1 1/16	142	169	50	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)	
27,5	(eShop)	(eShop)	—	146	174	50	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)	
28	(eShop)	(eShop)	—	146	174	50	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)	
28,5	(eShop)	(eShop)	1 1/8	151	180	50	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)	
29	(eShop)	eShop	—	151	180	50	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)	
29,5	(eShop)	(eShop)	—	155	185	50	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)	
30	(eShop)	(eShop)	—	155	185	50	SOGX 09T308 28-...	239652 8IP6 (2.2 Nm)	
30,5	(eShop)	(eShop)	—	163	194	63	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)	
31	(eShop)	(eShop)	1 7/32	163	194	63	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)	
31,5	(eShop)	(eShop)	—	167	199	63	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)	
32	(eShop)	(eShop)	—	167	199	63	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)	
32,5	(eShop)	(eShop)	1 9/32	172	205	63	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)	
33	(eShop)	(eShop)	—	172	205	63	SOGX 100408 32-...	239652 15IP1 (2.8 Nm)	
33,5	(eShop)	(eShop)	—	176	210	63	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)	
34	(eShop)	(eShop)	—	176	210	63	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)	
34,5	(eShop)	(eShop)	—	181	216	63	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)	
35	(eShop)	(eShop)	1 3/8	181	216	63	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)	
35,5	(eShop)	(eShop)	—	185	221	63	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)	
36	(eShop)	(eShop)	—	185	221	63	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)	
36,5	(eShop)	(eShop)	1 7/16	190	227	63	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)	
37	(eShop)	(eShop)	—	190	227	63	SOGX 110408 38-...	239652 15IP1 (2.8 Nm)	
37,5	(eShop)	(eShop)	—	194	232	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
38	(eShop)	(eShop)	1 1/2	194	232	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
38,5	(eShop)	(eShop)	—	199	238	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
39	(eShop)	(eShop)	—	199	238	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
39,2	(eShop)	(eShop)	—	203	243	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
39,5	(eShop)	(eShop)	—	203	243	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
40	(eShop)	(eShop)	—	203	243	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
40,5	(eShop)	(eShop)	1 19/32	208	249	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
41	(eShop)	(eShop)	—	208	249	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
41,5	(eShop)	(eShop)	—	212	254	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
42	(eShop)	(eShop)	1 21/32	212	254	63	SOGX 120408 42-...	239652 20IP (6.3 Nm)	
42,5	(eShop)	(eShop)	—	217	260	63	SOGX 130508 46-...	239652 20IP (6.3 Nm)	
43	(eShop)	(eShop)	—	217	260	63	SOGX 130508 46-...	239652 20IP (6.3 Nm)	
43,5	(eShop)	(eShop)	—	221	265	63	SOGX 130508 46-...	239652 20IP (6.3 Nm)	
44	(eShop)	(eShop)	—	221	265	63	SOGX 130508 46-...	239652 20IP (6.3 Nm)	
44,5	(eShop)	(eShop)	1 3/4	226	271	63	SOGX 130508 46-...	239652 20IP (6.3 Nm)	
45	(eShop)	(eShop)	—	226	271	63	SOGX 130508 46-...	239652 20IP (6.3 Nm)	
45,5	(eShop)	(eShop)	—	230	276	63	SOGX 130508 46-...	239652 20IP (6.3 Nm)	
46	(eShop)	(eShop)	1 13/16	230	276	63	SOGX 130508 46-...	239652 20IP (6.3 Nm)	

KOMET Carbide indexable inserts SOGX.. for KUB Pentron® type W80

Note:

23 6607 – Do not use in the centre pocket of indexable drills!

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
23 6605/23 6609	400	250	200	260	240	220	180	160						150	150		140	●		●			
23 6607																	120		●				
23 6608	500	280	220																●				
23 6610														160	160	75			●				



23 6605



23 6607



23 6608



23 6609



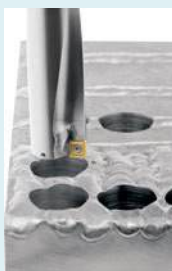
23 6610

Designation type W80			10-010	10-030	12-010	12-030	18-010	18-030	20-010	20-030		Type
24R 23 6605	KOMET® indexable insert	BK8425	eShop	–	eShop	–	eShop	–	eShop	–	–	Uni
24R 23 6607		BK6115	eShop	–	eShop	–	eShop	–	eShop	–	–	GG(G)
24R 23 6608		BK7710	eShop	–	eShop	–	eShop	–	eShop	–	–	Alu
24R 23 6609		BK8430	–	eShop	–	eShop	–	eShop	–	eShop	–	Uni
24R 23 6610		BK7935	eShop	–	eShop	–	eShop	–	eShop	–	–	Inox
ISO code indexable insert			SOGX 040204-01	SOGX 040204-03	SOGX 050204-01	SOGX 050204-03	SOGX 060206-01	SOGX 060206-03	SOGX 07T208-01	SOGX 07T208-03		
Feed f in steel < 900 N/mm ²		mm/rev.	0.07	0.07	0.1	0.1	0.1	0.1	0.12	0.12		

Designation type W80			24-010	24-030	28-010	28-030	32-010	32-030	38-010	38-030		Type
24R 23 6605	KOMET® indexable insert	BK8425	eShop	–	eShop	–	eShop	–	eShop	–	–	Uni
24R 23 6607		BK6115	eShop	–	eShop	–	eShop	–	eShop	–	–	GG(G)
24R 23 6608		BK7710	eShop	–	eShop	–	eShop	–	eShop	–	–	Alu
24R 23 6609		BK8430	–	eShop	–	eShop	–	eShop	–	eShop	–	Uni
24R 23 6610		BK7935	eShop	–	eShop	–	eShop	–	eShop	–	–	Inox
ISO code indexable insert			SOGX 080308-01	SOGX 080308-03	SOGX 09T308-01	SOGX 09T308-03	SOGX 100408-01	SOGX 100408-03	SOGX 110408-01	SOGX 110408-03		
Feed f in steel < 900 N/mm ²		mm/rev.					0.13					

Designation type W80			42-010	42-030	46-010	46-030		Type	
24R	23 6605	KOMET® indexable insert	BK8425	eShop	—	eShop	—	Uni	
24R	23 6607		BK6115	eShop	—	eShop	—	GG(G)	
24R	23 6608		BK7710	eShop	—	eShop	—	Alu	
24R	23 6609		BK8430	—	eShop	—	eShop	—	Uni
24R	23 6610		BK7935	eShop	—	eShop	—	—	Inox
ISO code indexable insert			SOGX 120408-01	SOGX 120408-03	SOGX 130508-01	SOGX 130508-03			
Feed f in steel < 900 N/mm²			mm/rev.	0.13					

KOMET KUB Pentron® ideal for extreme machining situations



Spot-facing on a weld seam or corrugated surface.



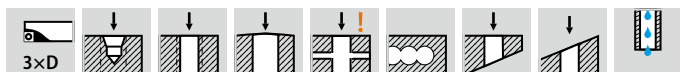
Spot-facing on a step.



Spot-facing on a sharp corner.



Drilling through stacked components.



KOMET Indexable drill KUB Trigon® 3xD right-hand cutting

- Special manufacturing procedure for extremely large flutes with very high rigidity.
- Specific positioning of the indexable inserts for bores free of withdrawal marks and with precise dimensional stability (± 0.1 mm as a rule).
- Internal coolant supply is directed to the cutting edges (sophisticated geometry, ideal for minimum lubrication).
- 3 – 10 bar coolant pressure is sufficient.
- For stationary and rotating applications.
- Offset-axis drilling: dependent on $\varnothing$ up to 1.5 mm.

Application: With indexable inserts No. 236740 – 237080.

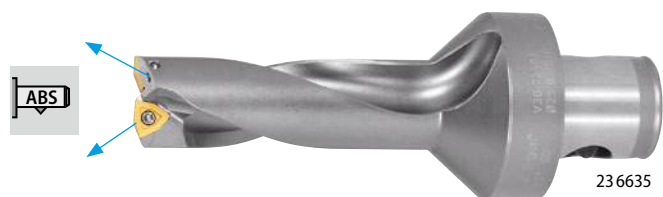
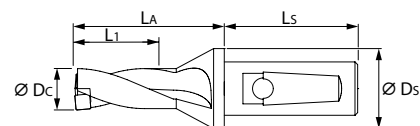
Supplied with: Clamp screws (without indexable inserts).

Note:

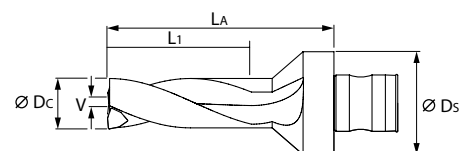
- Note! A disc falls off when the drill exits. Risk of injury if the component is rotating! Please take safety precautions.
- **On request** – left-hand cutting; – 2xD, – other $\varnothing$; – special types – torsional vibration damper for ABS giving low-vibration machining, with maximum tool life and minimum noise level.



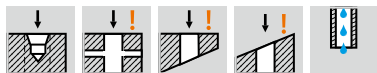
23 6630



23 6635



Ø D _c	24P	23 6630	24P	23 6635	for inch Ø	L _A		Ø D _s	ABS° Ø D _s	L _s	achievable maximum Ø offset	Maximum ad- justment limit V _{max}	ISO code indexable insert	Set of insert screws
	KOMET KUB Trigon® indexable drill													
	Combination shank	ABS 50	23 6630	23 6635		23 6630	23 6635							
mm	3×D	3×D	in	mm	mm	mm	mm	mm	mm	mm	mm	mm		
14	eShop	eShop	—	66	77	25	50	56	15	0.5	WOEX 030204 10-...		239652 6IP1 (0.6 Nm)	
15	eShop	eShop	19/32	69	80	25	50	56	16	0.5	WOEX 030204 10-...		239652 6IP1 (0.6 Nm)	
16	eShop	eShop	—	72	83	25	50	56	17	0.5	WOEX 030204 10-...		239652 6IP1 (0.6 Nm)	
17	eShop	(eShop)	—	75	86	25	50	56	18	0.5	WOEX 030204 10-...		239652 6IP1 (0.6 Nm)	
17,5	eShop	eShop	11/16	78	89	25	50	56	18.5	0.5	WOEX 030204 10-...		239652 6IP1 (0.6 Nm)	
18	eShop	eShop	—	78	89	25	50	56	19	0.5	WOEX 030204 10-...		239652 6IP1 (0.6 Nm)	
18,5	eShop	(eShop)	—	81	92	25	50	56	19.5	0.5	WOEX 030204 10-...		239652 6IP1 (0.6 Nm)	
19	eShop	eShop	3/4	81	92	25	50	56	20	0.5	WOEX 030204 10-...		239652 6IP1 (0.6 Nm)	
19,5	eShop	(eShop)	—	84	95	25	50	56	20	0.25	WOEX 030204 10-...		239652 6IP1 (0.6 Nm)	
20	eShop	eShop	—	84	95	25	50	56	21	0.5	WOEX 040304 18-...		239652 6IP2 (1.0 Nm)	
21	eShop	eShop	—	87	98	25	50	56	22	0.5	WOEX 040304 18-...		239652 6IP2 (1.0 Nm)	
22	eShop	eShop	—	90	101	25	50	56	23	0.5	WOEX 040304 18-...		239652 6IP2 (1.0 Nm)	
22,5	eShop	—	—	93	—	25	—	56	23.5	0.5	WOEX 040304 18-...		239652 6IP2 (1.0 Nm)	
23	eShop	eShop	29/32	93	104	25	50	56	24	0.5	WOEX 040304 18-...		239652 6IP2 (1.0 Nm)	
24	eShop	eShop	—	96	107	25	50	56	25	0.5	WOEX 040304 18-...		239652 6IP2 (1.0 Nm)	
24,5	eShop	eShop	—	99	110	25	50	56	25.5	0.5	WOEX 040304 18-...		239652 6IP2 (1.0 Nm)	
25	eShop	eShop	—	99	110	25	50	56	26	0.5	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
26	eShop	eShop	—	102	113	32	50	60	28	1	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
26,5	(eShop)	eShop	—	105	116	32	50	60	28.5	1	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
27	eShop	(eShop)	1 1/16	105	116	32	50	60	30	1.5	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
28	eShop	eShop	—	108	119	32	50	60	31	1.5	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
29	eShop	eShop	—	111	122	32	50	60	32	1.5	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
29,5	eShop	(eShop)	—	114	125	32	50	60	32.5	1.5	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
30	eShop	eShop	—	119	130	32	50	60	32.5	1.25	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
31	(eShop)	eShop	1 7/32	122	133	32	50	60	33.5	1.25	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
32	eShop	eShop	—	125	136	32	50	60	34	1	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
33	eShop	eShop	—	128	139	32	50	60	34	0.5	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
34	eShop	eShop	—	131	142	32	50	60	35	0.5	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
35	eShop	eShop	1 3/8	134	145	32	50	60	36	0.5	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
36	eShop	eShop	—	137	148	32	50	60	37	0.5	WOEX 05T304 24-...		239652 8IP2 (1.3 Nm)	
37	—	(eShop)	—	—	161	—	50	—	40	1.5	WOEX 06T304 34-...		239652 10IP1 (2.8 Nm)	
38	eShop	eShop	1 1/2	153	164	32	50	60	41	1.5	WOEX 06T304 34-...		239652 10IP1 (2.8 Nm)	
39	eShop	eShop	—	156	167	32	50	60	42	1.5	WOEX 06T304 34-...		239652 10IP1 (2.8 Nm)	
39,5	—	(eShop)	—	—	170	—	50	—	42.5	1.5	WOEX 06T304 34-...		239652 10IP1 (2.8 Nm)	
40	eShop	eShop	—	159	170	32	50	60	43	1.5	WOEX 06T304 34-...		239652 10IP1 (2.8 Nm)	
41	—	eShop	—	—	173	—	50	—	44	1.5	WOEX 06T304 34-...		239652 10IP1 (2.8 Nm)	
42	eShop	eShop	1 21/32	165	176	32	50	60	45	1.5	WOEX 06T304 34-...		239652 10IP1 (2.8 Nm)	
43	—	eShop	—	—	179	—	50	—	45	1	WOEX 06T304 34-...		239652 10IP1 (2.8 Nm)	
44	eShop	eShop	—	171	182	32	50	60	45	0.5	WOEX 06T304 34-...		239652 10IP1 (2.8 Nm)	



KOMET KUB Centron® indexable drill

- Process reliable up to 8 (9)×D.
- Centring by centring point and slide bars.
- Stiff joint between base body and drill head.
- Ø of the slide bars is matched to indexable inserts with 0.4 mm edge radii. For through holes the Ø of the slide bars can be adjusted by means of shims.

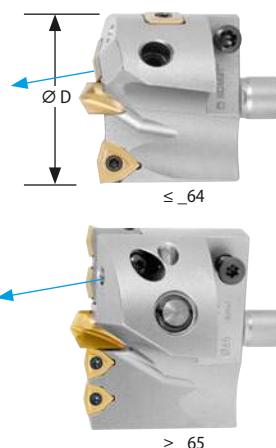
Suitable for: Base body No. 236652 – 236654.

Application:

- For rotating and stationary as well as vertical and horizontal use in all materials.
- With centring tips No. 236655 – 236657.
- With indexable inserts No. 236740 – 237080.

Supplied with: Drill head including slide bars (spare slide bars No. 236658).

From Ø 65 mm with indexable insert cartridges (cartridge for the outer indexable insert adjustable + 1 mm on the Ø).



Ø D _c	24L 23 6650	for inch Ø	Base body size	Screw for base body	Centring tip size	ISO code indexable insert	Set of insert screws
mm	KOMET KUB Centron® drill head	in					
20	eShop	—	20	239655 8IP	20	WOEX 030204	239655 6IP (0.6 Nm)
21	eShop	—	20	239655 8IP	20	WOEX 030204	239655 6IP (0.6 Nm)
22	eShop	—	20	239655 8IP	20	WOEX 030204	239655 6IP (0.6 Nm)
23	eShop	29/32	20	239655 8IP	20	WOEX 030204	239655 6IP (0.6 Nm)
24	eShop	—	20	239655 8IP	20	WOEX 030204	239655 6IP (0.6 Nm)
25	eShop	—	20	239655 8IP	20	WOEX 030204	239655 6IP (0.6 Nm)
26	eShop	—	26	239652 6IP2	26	WOEX 040304	239655 6IP (0.6 Nm)
27	eShop	1 1/16	26	239652 6IP2	26	WOEX 040304	239655 6IP (0.6 Nm)
28	eShop	—	26	239652 6IP2	26	WOEX 040304	239655 6IP (0.6 Nm)
29	eShop	—	26	239652 6IP2	26	WOEX 040304	239655 6IP (0.6 Nm)
30	eShop	—	26	239652 6IP2	26	WOEX 040304	239655 6IP (0.6 Nm)
31	eShop	1 7/32	26	239652 6IP2	26	WOEX 040304	239655 6IP (0.6 Nm)
32	eShop	—	26	239652 6IP2	26	WOEX 040304	239655 6IP (0.6 Nm)
33	eShop	—	33	239655 15IP1	26	WOEX 05T304	239655 8IP2 (1.3 Nm)
34	eShop	—	33	239655 15IP1	26	WOEX 05T304	239655 8IP2 (1.3 Nm)
35	eShop	1 3/8	33	239655 15IP1	26	WOEX 05T304	239655 8IP2 (1.3 Nm)
36	eShop	—	33	239655 15IP1	26	WOEX 05T304	239655 8IP2 (1.3 Nm)
37	(eShop)	—	33	239655 15IP1	26	WOEX 05T304	239655 8IP2 (1.3 Nm)
38	eShop	1 1/2	33	239655 15IP1	26	WOEX 05T304	239655 8IP2 (1.3 Nm)
39	eShop	—	33	239655 15IP1	26	WOEX 05T304	239655 8IP2 (1.3 Nm)
40	eShop	—	40	239655 20IP1	40	WOEX 05T304	239655 8IP2 (1.3 Nm)
41	(eShop)	—	40	239655 20IP1	40	WOEX 05T304	239655 8IP2 (1.3 Nm)
42	eShop	1 21/32	40	239655 20IP1	40	WOEX 05T304	239655 8IP2 (1.3 Nm)
43	(eShop)	—	40	239655 20IP1	40	WOEX 05T304	239655 8IP2 (1.3 Nm)
44	eShop	—	40	239655 20IP1	40	WOEX 05T304	239655 8IP2 (1.3 Nm)
45	eShop	—	40	239655 20IP1	40	WOEX 05T304	239655 8IP2 (1.3 Nm)
46	eShop	1 13/16	46	239655 20IP	46	WOEX 06T304	239655 10IP (2.8 Nm)
47	(eShop)	—	46	239655 20IP	46	WOEX 06T304	239655 10IP (2.8 Nm)
48	eShop	—	46	239655 20IP	46	WOEX 06T304	239655 10IP (2.8 Nm)
49	(eShop)	—	46	239655 20IP	46	WOEX 06T304	239655 10IP (2.8 Nm)
50	eShop	1 31/32	46	239655 20IP	46	WOEX 06T304	239655 10IP (2.8 Nm)
51	eShop	—	46	239655 20IP	46	WOEX 06T304	239655 10IP (2.8 Nm)
52	eShop	—	46	239655 20IP	46	WOEX 06T304	239655 10IP (2.8 Nm)
53	(eShop)	—	46	239655 20IP	46	WOEX 06T304	239655 10IP (2.8 Nm)
54	(eShop)	2 1/8	46	239655 20IP	46	WOEX 06T304	239655 10IP (2.8 Nm)
55	(eShop)	—	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
56	eShop	—	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
57	(eShop)	—	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
58	eShop	2 9/32	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
59	eShop	—	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
60	eShop	—	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
61	(eShop)	—	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
62	eShop	2 7/16	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
63	(eShop)	—	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
64	(eShop)	—	55	239655 20IP2	46	WOEX 080404	239655 15IP (6.3 Nm)
65	eShop	2 9/16	65	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
66	(eShop)	—	65	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
67	(eShop)	—	65	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
68	(eShop)	—	65	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
69	(eShop)	2 23/32	65	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
70	eShop	—	65	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
71	(eShop)	—	65	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
72	(eShop)	—	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
73	(eShop)	2 7/8	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
74	(eShop)	—	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
75	(eShop)	—	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
76	(eShop)	—	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
77	(eShop)	3 1/32	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
78	(eShop)	—	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
79	(eShop)	—	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
80	(eShop)	—	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)
81	(eShop)	3 3/16	72	239655 20IP3	65	WOEX 05T304	239655 8IP2 (1.3 Nm)



23

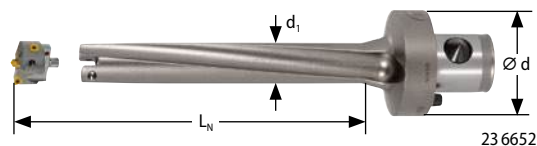


KOMET KUB Centron® base body

- Process reliable up to 4×D.
- Stiff joint between base body and drill head.
 - 23 6652 – ■ Shank type ABS.
 - 23 6653 – ■ Shank type ABS.
 - 23 6654 – ■ Shank type ABS.

Application: For rotating and stationary as well as vertical and horizontal use in all materials.

Note: Further sizes and spare parts on request.



Ø D _c	mm	20	26	33	40	46	55	65	72
24K 23 6653	4×D	eShop	eShop	eShop	(eShop)	eShop	eShop	eShop	(eShop)
24K 23 6652	6×D	eShop	eShop	eShop	(eShop)	eShop	eShop	(eShop)	(eShop)
24K 23 6654	8×D	eShop	eShop	eShop	eShop	eShop	(eShop)	(eShop)	(eShop)
suitable for drilling head	mm	20 – 25	26 – 32	33 – 39.2	40 – 45	46 – 54	55 – 64	65 – 71	72 – 81
L ₁ (23 6653)	mm	113	130	160	185	215	260	295	325
L ₁ (23 6652)	mm	150	175	215	260	310	370	420	460
L ₁ (23 6654)	mm	200	230	290	340	415	495	560	610
Ø d ₁	mm	19	25	32	38.5	44.5	53.5	63.5	70.5
L _{tot} (23 6653)	mm	145	160	195	235	280	325	375	405
L _{tot} (23 6652)	mm	185	210	255	310	375	435	500	540
L _{tot} (23 6654)	mm	235	260	330	390	480	560	640	690
ABS® Ø D _s	mm	50	50	50	63	80	80	80	100

KOMET KUB Centron® centring point

Suitable for: Centron No. 236650.

Type		20	26	40	46	65	Suitability
24M 23 6655	KOMET KUB Centron® centring point, HSS	TiAlN	eShop	eShop	eShop	eShop	Inox / cast iron
24M 23 6656	KOMET KUB Centron® centring point, HSS	TiN	eShop	eShop	eShop	eShop	Steel / alu
24M 23 6657	KOMET KUB Centron® centring point, carbide	TiN	eShop	eShop	eShop	–	Steel / stainless steel
Ø d ₁	mm	5	6	8	10	12	
suitable for drilling head	mm	20 – 25	26 – 39	40 – 45	46 – 64	65 – 81	



Garant Power Drill – the entire range

GARANT Power Drill indexable drill for right-hand cutting, with ABS interface.

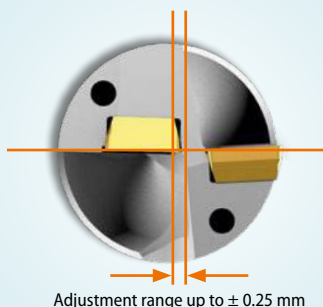
- Optimum torque transmission.
- Low volume in production. Helical coolant holes also ensure very high stability, since they do not weaken the core of the drill.

Scope of range:

- Covers diameters of 14 – 40 mm.
- Length ratio 3×D and 5×D.
- ABS50 up to diameter 30 mm.
- ABS63 up to diameter 50 mm.

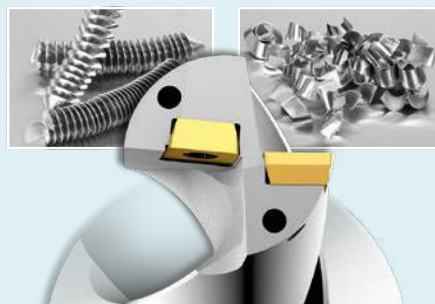
Individual adjustment range

The GARANT Power Drill has an adjustment range of up to ± 0.25 mm from the centre to cover various diameter ranges.



Chip evacuation

Due to the larger flutes and the positioning of the cooling channels at the edges of the drill, chip evacuation and stability are significantly increased.



Excellently formed chips for good chip evacuation.

Choice of insert

Suitable inserts and sizes are available for the different machining challenges.





Designation type W29			24-000	24-010	24-030	24-110	24-130	24-200		Type
24T	23 6740	KOMET® Unisix® indexable insert	P25M	eShop	eShop	—	—	—	—	ST900
24T	23 6760		P40	—	(eShop)	—	—	—	—	ST900
24T	23 6771		BK6425	eShop	—	—	—	—	—	ST900; INOX
24T	23 6780		BK62	—	eShop	—	—	—	—	GG(G)
24T	23 6791		BK6440	eShop	—	—	—	—	—	ST900
24T	23 6830		BK72	—	eShop	—	—	—	—	ST1400
24T	23 6840		BK8425	—	eShop	—	—	—	—	ST1400
24T	23 6841		BK8425	eShop	—	—	—	—	—	ST1400
24T	23 6860		BK6115	—	(eShop)	—	—	—	—	GG(G) / ST900
24T	23 6910		BK7935	—	eShop	—	—	—	—	INOX
24T	23 6930		BK8425	—	—	eShop	—	—	—	ST900
24T	23 6980		BK7710	—	—	—	eShop	—	—	Alu; CuZn
24T	23 7000		BK8425	—	—	—	—	eShop	—	INOX
24T	23 7050		BK79	—	—	—	—	eShop	—	INOX
24T	23 7080		BK2730	—	—	—	—	—	eShop	—
ISO code indexable insert			WOEX 05T304							
Feed f in steel < 900 N/mm²			mm/rev. 0.14							
Suitable for:			No. 236630; 236635; 236650; 236660; 236685; 236686							

Designation type W29			34-000	34-010	34-030	34-110	34-130	34-200		Type
24T 23 6740	KOMET® Unisix® indexable insert	P25M	eShop	eShop	—	—	—	—	—	ST900
24T 23 6760		P40	—	(eShop)	—	—	—	—	—	ST900
24T 23 6771		BK6425	eShop	—	—	—	—	—	—	ST900; INOX
24T 23 6780		BK62	—	eShop	—	—	—	—	—	GG(G)
24T 23 6791		BK6440	eShop	—	—	—	—	—	—	ST900
24T 23 6830		BK72	—	eShop	—	—	—	—	—	ST1400
24T 23 6840		BK8425	—	eShop	—	—	—	—	—	ST1400
24T 23 6841		BK8425	eShop	—	—	—	—	—	—	ST1400
24T 23 6860		BK6115	—	(eShop)	—	—	—	—	—	GG(G) / ST900
24T 23 6910		BK7935	—	eShop	—	—	—	—	—	INOX
24T 23 6930		BK8425	—	—	eShop	—	—	—	—	ST900
24T 23 6980		BK7710	—	—	—	eShop	—	—	—	Alu; CuZn
24T 23 7000		BK8425	—	—	—	—	eShop	—	—	INOX
24T 23 7050		BK79	—	—	—	—	eShop	—	—	INOX
24T 23 7080	BK2730	—	—	—	—	—	eShop	—	INOX	
ISO code indexable insert			WOEX 06T304							
Feed f in steel < 900 N/mm²			mm/rev. 0.15							
Suitable for:			No. 236650; 236660; 236685; 236686							

Designation type W29			42-000	42-010	42-030	42-110	42-130	42-200		Type
24T 23 6740	KOMET® Unisix® indexable insert	P25M	eShop	eShop	—	—	—	—	—	ST900
24T 23 6760		P40	—	(eShop)	—	—	—	—	—	ST900
24T 23 6771		BK6425	eShop	—	—	—	—	—	—	ST900; INOX
24T 23 6780		BK62	—	eShop	—	—	—	—	—	GG(G)
24T 23 6791		BK6440	eShop	—	—	—	—	—	—	ST900
24T 23 6830		BK72	—	eShop	—	—	—	—	—	ST1400
24T 23 6840		BK8425	—	eShop	—	—	—	—	—	ST1400
24T 23 6841		BK8425	eShop	—	—	—	—	—	—	ST1400
24T 23 6860		BK6115	—	(eShop)	—	—	—	—	—	GG(G) / ST900
24T 23 6910		BK7935	—	eShop	—	—	—	—	—	INOX
24T 23 6930		BK8425	—	—	eShop	—	—	—	—	ST900
24T 23 6980		BK7710	—	—	—	eShop	—	—	—	Alu; CuZn
24T 23 7000		BK8425	—	—	—	—	eShop	—	—	INOX
24T 23 7050		BK79	—	—	—	—	eShop	—	—	INOX
24T 23 7080	BK2730	—	—	—	—	—	eShop	—	INOX	
ISO code indexable insert			WOEX 080404							
Feed f in steel < 900 N/mm²			mm/rev. 0.16							
Suitable for:			No. 236650; 236660; 236685; 236686							



Designation type W29			50-000	50-010	50-030	50-110	50-130	50-200		Type
24T	23 6740	P25M	eShop	eShop	–	–	–	–	–	ST900
24T	23 6760	P40	–	(eShop)	–	–	–	–	–	ST900
24T	23 6771	BK6425	eShop	–	–	–	–	–	–	ST900; INOX
24T	23 6780	BK62	–	eShop	–	–	–	–	–	GG(G)
24T	23 6791	BK6440	eShop	–	–	–	–	–	–	ST900
24T	23 6830	BK72	–	eShop	–	–	–	–	–	ST1400
24T	23 6840	BK8425	–	eShop	–	–	–	–	–	ST1400
24T	23 6841	BK8425	eShop	–	–	–	–	–	–	ST1400
24T	23 6860	BK6115	–	(eShop)	–	–	–	–	–	GG(G) / ST900
24T	23 6910	BK7935	–	eShop	–	–	–	–	–	INOX
24T	23 6930	BK8425	–	–	eShop	–	–	–	–	ST900
24T	23 6980	BK7710	–	–	–	eShop	–	–	–	Alu; CuZn
24T	23 7000	BK8425	–	–	–	–	eShop	–	–	INOX
24T	23 7050	BK79	–	–	–	–	eShop	–	–	INOX
24T	23 7080	BK2730	–	–	–	–	–	eShop	–	INOX
ISO code indexable insert			WOEX 100504							
Feed f in steel < 900 N/mm ²			0.2							
Suitable for:			No. 236685; 236686							

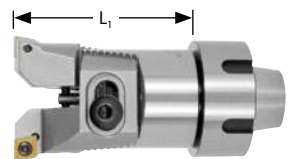
Designation type W29			58-000	58-010	58-030		Type
24T	23 6740	P25M	–	eShop	–	–	ST900
24T	23 6760	P40	–	(eShop)	–	–	ST900
24T	23 6780	BK62	–	eShop	–	–	GG(G)
24T	23 6791	BK6440	eShop	–	–	–	ST900
24T	23 6830	BK72	–	eShop	–	–	ST1400
24T	23 6840	BK8425	–	eShop	–	–	ST1400
24T	23 6841	BK8425	eShop	–	–	–	ST1400
24T	23 6860	BK6115	–	(eShop)	–	–	GG(G) / ST900
24T	23 6910	BK7935	–	eShop	–	–	INOX
24T	23 6930	BK8425	–	–	eShop	–	ST900
ISO code indexable insert			WOEX 120608				
Feed f in steel < 900 N/mm ²			0.2				
Suitable for:			No. 236685; 236686				



Garant Twin cutter heads Ø 23.5 – 153.0 mm.

The dual toolholder head consists of a base body and indexable insert holder. Cutters individually adjustable.

Application: For boring out exiting holes.



23 7609

Twin cutter head ER

Integral taper allows simple connection to ER collet chucks.

Connection		ER25	ER32	ER40
29W	23 7609 Twin cutter head ER	eShop	eShop	eShop
suitable indexable insert		CC..09T3..	CC..09T3..	CC..1204..
L ₁	mm	65	75	85
Boring range Ø	mm	39.5 – 51.1	49.5 – 67.1	65.5 – 87.1
Insert screw		219805	219805	219864

Twin cutter head HW

Connection to the HW port.
With synchronised spindle on request.



23 7610

Connection		HW20	HW25	HW32	HW40	HW50	HW63	HW80
20N	23 7610 Twin cutter head HW	eShop	eShop	eShop	eShop	eShop	eShop	eShop
suitable indexable insert		CC..0602..	CC..0602..	CC..09T3..	CC..09T3..	CC..1204..	CC..1204..	CC..1204..
L ₁	mm	45	56	66	75	90	110	140
Boring range Ø	mm	23.5 – 30.5	29.5 – 40.1	39.5 – 50.5	49.5 – 66.5	65.5 – 87.5	86.5 – 115.5	114.5 – 153
Insert screw		219830	219830	219805	219805	219864	219864	219864

Garant

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	CRP						
23 7621	240	240	240	180	210	170	100	90	80	70	60	110	90	40	150	290	100	●	●	●	○		

Micro-boring heads with plain shank



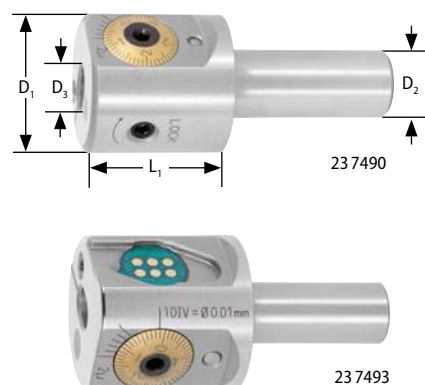
Adjustment accuracy 0.01 mm per graduation / with vernier 0.002 mm on the Ø.

23 7493/7498 – **Digital** boring heads with **additional precise reading facility** on **0.001 mm in Ø** via **digital display unit No. 237601** (order separately).

Ø adjustment with minimum backlash thanks to direct measuring system.

Application: With cutting insert No. 237621, adapter No. 237624 and insert No. 237625.

29W	23 7490	Micro-boring head Ø 0.3 - 7.1 mm:	eShop
29W	23 7493	Micro-boring head Digital Ø 0.3 - 7.1 mm	eShop
	Ø D ₁	mm	25
	Ø D ₃	mm	4
	L ₁	mm	25
	Ø D ₂	mm	10
29W	23 7495	Micro-boring head Ø 0.3 - 19.1 mm:	eShop
29W	23 7498	Micro-boring head Digital Ø 0.3 - 19.1 mm	eShop
	Ø D ₁	mm	32
	Ø D ₃	mm	7
	L ₁	mm	32
	Ø D ₂	mm	16



Cutter insert / reducer sleeve

Size 16-7 – Shank Ø 16 mm

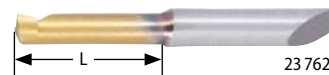
Application: For micro-boring heads.

Size 7-4 – For micro-boring heads No. 237495 and No. 237598. Reduction of the arbor **from 7 mm to 4 mm**, for use of cutter inserts No. 237621 size 0.3 – 3.9.

Size 16-7 – For indexable inserts and adapters in Ø 7 mm. In connection with boring heads No. 237513; 237546; 237568 and 237591.

Size 0,3–3,9 – **Shank - Ø 4 mm** for direct fitting in head No. 237490 and 237493.

Size 5,2–6,9 – **Shank - Ø 7 mm** for direct fitting in head No. 237495 and 237498.



Ø	mm	0,3	0,6	1,0	2,2	3,2	3,9	5,2	6,2	6,9
20W 23 7621	Cutter insert	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
Shank Ø	mm	4	4	4	4	4	4	7	7	7
Length L	mm	1.2	2.5	4	6	10.2	15.2	20.3	20.3	25.4
Boring range Ø	mm	0.3 – 0.7	0.6 – 1.1	1 – 2.3	2.2 – 3.3	3.2 – 4.3	3.9 – 7.1	5.2 – 6.3	6.2 – 7.3	6.9 – 12.1

Type		7-4	16-7
23 7626	Reducer sleeve	eShop	eShop



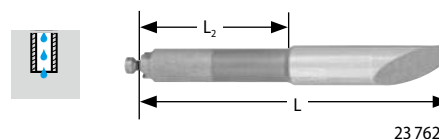
Adapter / insert

Application: For micro-boring heads No. 237495 and No. 237498.

With adaptor allows inserts No. 237625.

Boring range Ø 6.9 – 19.1 mm.

Ø D _{min}	mm	6,9	9,9
23 7624 Adapter		eShop	eShop
Type		D07	D10
Shank Ø	mm	7	
L ₁	mm	30	35
Length L	mm	56	61
Boring range Ø	mm	6,9 – 10,1	9,9 – 19,1



Ø D _{min}	mm	6,9	7,9	8,9	9,9	11,9	13,9
29W 23 7625 Insert		eShop	eShop	eShop	eShop	eShop	eShop
for type		D07	D07	D07	D10	D10	D10
maximum bore depth	mm	30	30	30	35	35	35
Boring range Ø	mm	6.9 – 8.1	7.9 – 9.1	8.9 – 10.1	9.9 – 12.1	11.9 – 14.1	13.9 – 19.1



Garant Fine boring head ER Ø 39.9 - 70.1 mm (100.1 mm)

23 7501 – The Monoblock System consists of a **boring tool with an integral taper** which is simply screwed on to the existing **ER25 collet chuck**. Quick rough adjustment.
Can be extended with the bridge No. 237508 to Ø 100.1 mm.

Application:

23 7501 – Adjustment accuracy 0.01 mm on the Ø. Spindle nose with suitable standard ISO insert type **CC..0602**.

Supplied with:

23 7501 – With indexable insert No. 260052 size CU7010.

Spare part:

23 7501 – Insert screw No. 237606 size 1.

Recommendation:

23 7501 – Best with indexable inserts No. 237695 and 237696.

Note:

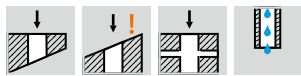
23 7501 – During the extraction cycle ensure cutting edge orientation $\pm 20^\circ$!



23 7501



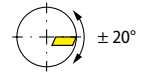
23 7508



Garant Precision boring sets ER

- **Adjustment accuracy: 0.01 mm per graduation. Adjustment accuracy 0.002 mm on the Ø via vernier.**
- At the 0 position, without tool, balanced to Q2.5 / 6000 rpm.
- Max. speed 10,000 rpm.
- Cooling using a coolant nozzle, optimum coolant pressure 10 – 20 bar, minimum 5 bar.
- Slides radially adjustable with clamp.

Note: During the extraction cycle ensure cutting edge orientation $\pm 20^\circ$!



ER25 Ø 39.9–100.1 mm

For Ø range 39.9 - 100.1 mm. **The modular ER precision boring tool can be adapted directly on to the ER25 collet chuck.** Supplied in an ABS plastic case.

Spare part: Insert screw No. 239653 (8IP; 1.28 Nm) for tool cartridge No. 237517 size 1 and size 2.

Note: Suitable indexable insert **CCGT0602..** (for instance No. 237695 / 237696) please order these separately.

Connection		ER25
2IF 23 7502	Precision boring set Ø 39.9 – 100.1 mm	eShop
Supplied with:		ER25
1 precision boring head		
1 each cartridge		No. 237517 size 1 for Ø 39.9 – 57 mm No. 237517 size 2 for Ø 57 – 100.1 mm
1 bridge		No. 237518 size 1 for Ø 70.1 – 100.1 mm
1 flag wrench		No. 625920 size 8IP
1 hexagon L-wrench		No. 627310 size 4
2 socket-head screws		No. 237522 size M5 × 12
2 plain washers		No. 237523
2 disc springs		No. 237524



23 7502

ER40 Ø 9.75–152.1 mm

For Ø range 9.75 - 152.1 mm. **The modular ER precision boring tool can be adapted directly on to the ER40 collet chuck.** Supplied in an ABS plastic case.

Note: Suitable indexable insert **CCGT0602..** and **CCGT09T3..** (for instance No. 237695 / 237698) please order these separately.

Connection		ER40
2IF 23 7509	Precision boring set Ø 9.75 – 152.1 mm	eShop
Supplied with:		ER40
1 fine boring head		
1 each cartridge		No. 237517 size 1 for Ø 25 – 37 mm No. 237517 size 2 for Ø 37 – 89 mm No. 237517 size 3 for Ø 89 – 152.1 mm
1 bridge		No. 237518 size 2 for Ø 101.1 – 152.1 mm
1 carrier for cartridge (max. boring length)		No. 237519 for Ø 25 – 63 mm (90 mm)
1 packing piece		No. 237520 for Ø 63 – 152.1 mm
1 each boring bar (max. boring length)		No. 237521 size 1 for Ø 9.75 – 18 mm (50 mm) No. 237521 size 2 for Ø 18 – 25 mm (77 mm)
1 each flag wrench		No. 625920 size 8IP No. 625920 size 10IP
1 hexagon L-wrench		No. 627424 size 4
2 socket-head screws		No. 237522 size M5 × 12
2 plain washers		No. 237523
2 disc springs		No. 237524



23 7509



Garant Micro-adjustable heads for Ø 23.9 – 153.1 mm

Micro-adjustable head ER

With integral taper. **Simple connection to ER collet chucks.**
Adjustment accuracy 0.002 mm on the Ø.

Application: Best with insert No. 237695 – 237698.

Note: During the extraction cycle ensure cutting edge orientation $\pm 20^\circ$!



23 7548

Connection		ER25	ER32	ER40
23 7548 Micro-adjustable head ER		eShop	eShop	eShop
suitable indexable insert		CC..0602..	CC..0602..	CC..09T3
Boring range Ø	mm	39.9 – 51.1	50.9 – 67.1	66.9 – 87.1
L ₁	mm	65	75	85
Insert screw		237606 size 1	237606 size 1	237606 size 2

Micro-adjustable head HW

23 7600 – **Adjustment accuracy 0.002 mm** on the Ø **via vernier.**

23 7602 – **Adjustment accuracy 0.001 mm** on the Ø **using display unit**
No. 237601.

Application: Best with insert No. 237695 – 237698.
With arbor No. 237651 – 237656.



23 7600

23 7602

Connection		HW20	HW25	HW32	HW40	HW50	HW63	HW80
23 7600 Micro-adjustable head HW		eShop	eShop	eShop	eShop	eShop	eShop	eShop
23 7602 Digital micro-adjustable head HW		eShop	eShop	eShop	eShop	eShop	eShop	eShop
suitable indexable insert		CC..0602..	CC..0602..	CC..0602..	CC..0602..	CC..09T3..	CC..09T3..	CC..09T3..
Boring range Ø	mm	23.9 – 31.1	30.9 – 40.1	39.9 – 51.1	50.9 – 67.1	66.9 – 87.1	86.9 – 116.1	115.9 – 153.1
L ₁	mm	45	56	66	75	90	110	140
Insert screw		237606 size 1	237606 size 1	237606 size 1	237606 size 1	237606 size 2	237606 size 2	237606 size 2

Garant Precision boring system ER HW63 Ø 9.75–101.1 mm (152.1 mm)

23 7512 – **The ER precision boring tool can be adapted directly on to the ER40 collet chuck.**

Application:

23 7512 – For boring bars with shank Ø 16 mm and insert toolholder.
Can be extended with adapter and insert toolholder to Ø 152.1 mm.
Adjustment accuracy 0.01 mm / with vernier 0.002 mm on the Ø.
Boring bars with suitable standard ISO insert type **CC..0602**.
Insert toolholders with suitable standard ISO insert type **CC..09T3**.

Spare part:

23 7512 – For No. 237630 – 237642: Insert screw No. 219830.
For No. 237645; 237531; 237532: Insert screw No. 219805.

Recommendation:

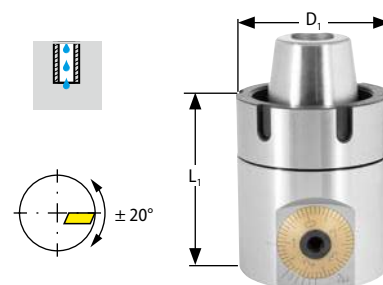
23 7512 – Best with inserts No. 237695 – 237698.

Note:
23 7512 Size ER40 – During the extraction cycle, ensure cutting edge orientation $\pm 20^\circ$!



23 7512

Connection		ER40	HW63
23 7512 Precision boring set Ø 9.75 – 101.1 mm		eShop	eShop
Supplied with: 1 fine boring head		No. 237513 ER40	No. 237513 HW63
1 pc. each boring bar (max. boring length)		No. 237630 boring bar Ø 9.75 – 20.1 mm (30 mm); No. 237634 boring bar Ø 19.75 – 30.1 mm (72 mm); No. 237640 boring bar Ø 29.75 – 48.1 mm (85 mm); No. 237642 boring bar Ø 47.75 – 88.1 mm (85 mm).	
1 insert toolholder		No. 237645 for Ø 87.75 – 101.1 mm (with adapter No. 237534 up to Ø 114.1 mm).	
1 each of insert		No. 260052 size CU7010 (or use CC..0602); No. 260058 size CU7010 (or use CC..09T3).	
Connection		ER40	HW63
23 7513 Fine boring head Ø 9.75 – 152.1 mm		eShop	eShop
Ø D ₁	mm	63	
L ₁	mm	50.5	
23 7531 Insert holder for CC..09T3 Ø 105.75 – 119.1 mm (up to 132.1 mm with adapter)		eShop	
23 7532 Insert holder Ø 125.75 – 139.1 mm (up to 152.1 mm with adapter)		eShop	
23 7534 Adapter F = 6.5 mm		eShop	



23 7513



23 7531

23 7532

23 7534

Garant Digital precision boring system HW63 Ø 9.75 – 101.1 mm (152.1 mm)

- 23 7515 – With **digital fine boring head** No. 237516, **digital display unit** No. 237601, boring bars and accessories in the case.
For boring bars with shank Ø 16 mm and insert toolholder.
Can be extended with adapter and insert toolholder to Ø 152.1 mm.
Adjustment accuracy 0.01 mm / with vernier 0.002 mm on the Ø.
With digital display unit, 0.001 mm on the Ø.
Boring bars with suitable standard ISO insert type **CC..0602**.
Insert holder with suitable standard ISO insert type **CC..09T3**.

Spare part:

- 23 7515 – For No. 237630 – 237642: Insert screw No. 219830.
For No. 237645; 237531; 237532: Insert screw No. 219805.

Recommendation:

- 23 7515 – Best with inserts no. 237695 - 237698.

Note:

- 23 7515 – Insert toolholder with adapter (No. 237531; 237532; 237534)
for expansion to 152.1 mm on the Ø: for individual products see precision boring set 237512.



Connection		HW63	
23 7515	Precision boring set Ø 9.75 – 101.1 mm	eShop	
Supplied with: 1 fine boring head		237516 HW63	
1 pc. each boring bar (max. boring length)		No. 237630 boring bar Ø 9.75 – 20.1 mm (30 mm); No. 237634 boring bar Ø 19.75 – 30.1 mm (72 mm); No. 237640 boring bar Ø 29.75 – 48.1 mm (85 mm); No. 237642 boring bar Ø 47.75 – 88.1 mm (85 mm)	
1 insert holder		No. 237645 for Ø 87.75 – 101.1 mm (with adapter No. 237534 up to Ø 114.1 mm)	
1 each of insert		No. 260052 CU7010 (or use CC..0602); No. 260058 CU7010 (or use CC..09T3)	
Connection		HW63	
23 7516	Fine boring head Ø 9.75 – 152.1 mm	eShop	
Ø D ₁	mm	63	
L ₁	mm	50.5	

Garant Precision boring systems for Ø 9.75 – 164 mm (320 mm)

- 23 7541 – For **Ø 9.75 – 164 mm**, with fine boring head No. 237546, boring bar and accessories in a case.
Can be extended with the bridge No. 237560 to Ø 320 mm.
Adjustment accuracy 0.01 mm per graduation / with vernier 0.002 mm on the Ø.

Application:

- 23 7541 – For boring bars with shank Ø 16 mm and precision boring bridges.
Boring bars / insert toolholder with suitable standard ISO insert type **CC..0602**.

Spare part:

- 23 7541/7546 – Insert screw No. 219830.

Recommendation:

- 23 7541 – Best with indexable inserts No. 237695 and No. 237696.



Connection		HW63		SK40	
29W	23 7541	Precision boring set Ø 9.75 – 164 mm		eShop	
Supplied with: 1 fine boring head		No. 237546 HW63		No. 237546 SK40	
1 each boring bar (max. boring length)		No. 237630 Ø 9.75 – 15.1 mm (30 mm), No. 237632 Ø 14.75 - 20.1 mm (51 mm); No. 237634 Ø 19.75 – 25.1 mm (72 mm), No. 237636 Ø 24.75 - 30.1 mm (82 mm); No. 237640 Ø 29.75 – 48.1 mm (85 mm), No. 237642 Ø 47.75 – 88.1 mm (85 mm).			
1 bridge		No. 237647 for Ø extension of 86 – 164 mm.			
1 insert holder for the bridge		No. 237564 06			
1 insert		No. 260052 size CU7010 (CCMT 060204)			
Connection		HW63		SK40	
29W	23 7546	Fine boring head Ø 9.75 – 320 mm		eShop	
Ø D ₁	mm			63	
L ₁	mm	–		81	
A	mm	60		91	
29W	23 7560	Bridge for boring range Ø 162 – 320 mm		eShop	
Type		06	09	23 7560	
29W	23 7564	Insert holder for bridges		eShop	



23 7564





Garant Precision boring systems for Ø 9.75 – 30.1 mm and 88.1 mm

23 7581 – For Ø 9.75 – 30.1 mm

23 7586 – For Ø 9.75 – 88.1 mm

23 7581/7586 – With fine boring head No. 237591, boring bars and accessories in a case.

Adjustment accuracy 0.01 mm per graduation / with vernier 0.002 mm on the Ø.

Ø adjustment with minimum backlash.

Application:

For boring bars with shank Ø 16 mm and precision boring bridges.

With ISO indexable inserts **type CC..0602...**

Spare part:

23 7581/7586 – Insert screw No. 219830.

Recommendation: Best with indexable inserts No. 237695 and No. 237696.



23 7586



Connection		HW63	SK40
29W 23 7581	Precision boring set Ø 9.75 – 30.1 mm	eShop	eShop
29W 23 7586	Precision boring set Ø 9.75 – 88.1 mm	eShop	eShop
Supplied with: 1 fine boring head		No. 237591 HW63	No. 237591 SK40
1 each boring bar (max. boring length)		No. 237630 Ø 9.75 – 15.1 mm (30 mm), No. 237632 Ø 14.75 – 20.1 mm (51 mm); No. 237634 Ø 19.75 – 25.1 mm (72 mm), No. 237636 Ø 24.75 – 30.1 mm (82 mm). No. 237640 Ø 29.75 – 48.1 mm (85 mm), No. 237642 Ø 47.75 – 88.1 mm (85 mm).	
1 each boring bar (max. boring length) (23 7586)		No. 237564 06	
1 insert holder for the bridge		No. 260052 size CU7010 (CCMT 060204)	
1 insert			
Connection		HW63	SK40
29W 23 7591	Fine boring head Ø 9.75 – 88.1 mm	eShop	eShop
Ø D ₁	mm	55	
L ₁	mm	69	
A	mm	90	



Garant Digital precision boring systems for Ø 9.75 – 30.1 mm and 88.1 mm

23 7566 – For Ø 9.75 – 30.1 mm

23 7567 – For Ø 9.75 – 88.1 mm

23 7566/7567 – With **digital fine boring head** No. 237568,

digital display unit No. 237601, boring bars and accessories in a case.

Adjustment accuracy 0.01 mm per graduation / with vernier 0.002 mm on the Ø.

With additional precise reading facility to 0.001 mm in Ø.

Ø adjustment with minimum backlash thanks to direct measuring system.

Application:

23 7566/7567 – For boring bars with shank Ø 16 mm and precision boring bridges.

With ISO indexable inserts **type CC..0602...**

Spare part:

23 7566/7567 – Insert screw No. 219830.

Recommendation:

23 7566/7567 – Best with indexable inserts No. 237695 and No. 237696.



23 7601



23 7567



Connection		HW63	SK40
29W 23 7566	Digital precision boring set with fine boring head Ø 9.75 – 30.1 mm	eShop	eShop
29W 23 7567	Digital precision boring set with fine boring head Ø 9.75 – 88.1 mm	eShop	eShop
Supplied with: 1 fine boring head		No. 237568 HW63	No. 237568 SK40
1 each boring bar (max. boring length)		No. 237630 Ø 9.75 – 15.1 mm (30 mm), No. 237632 Ø 14.75 – 20.1 mm (51 mm); No. 237634 Ø 19.75 – 25.1 mm (72 mm), No. 237636 Ø 24.75 – 30.1 mm (82 mm). No. 237640 Ø 29.75 – 48.1 mm (85 mm), No. 237642 Ø 47.75 – 88.1 mm (85 mm).	
1 each boring bar (max. boring length) (23 7567)		No. 237564 06	
1 insert holder for the bridge		No. 260052 size CU7010 (CCMT 060204)	
1 insert			
Connection		HW63	SK40
29W 23 7568	Fine boring head Ø 9.75 – 88.1 mm	eShop	eShop
Ø D ₁	mm	55	
L ₁	mm	70	
A	mm	90	

Garant Precision boring system HW63 for Ø 86 – 302 mm (402 mm)

23 7570 – Complete precision boring set for Ø 86 - 302 mm, with fine boring head no. 237571, insert holder and accessories in a case.

Can be extended with indexable insert holder no. 237573 242-402 up to Ø 402 mm.
Adjustment accuracy 0.01 mm per graduation/with vernier 0.002 mm on the Ø.

Application:

23 7570/7573 – Insert holders with suitable standard ISO insert type CC..09T3..

Spare part:

23 7570/7573 – Insert screw No. 219805.

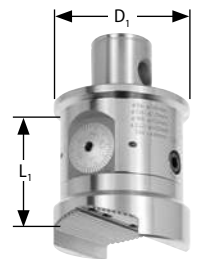
Recommendation:

23 7570/7573 – Best with indexable inserts No. 237697 and No. 237698.

Connection		HW63	
29W	23 7570	Precision boring set Ø 86 – 302 mm	eShop
Supplied with: 1 fine boring head		237571 HW63	
1 each insert holder		No. 237573 86-138 for Ø 86– 138 No. 237573 136-220 for Ø 136– 220 No. 237573 188-302 for Ø 188– 302 No. 237574 86 for No. 237573 86-138	
1 each support		No. 237574 136 for No. 237573 136-220, 188-302 and 242-402	
1 each pressure pad		No. 237575 86 for No. 237573 86-138 No. 237575 136 for No. 237573 136-220, 188-302 and 242-402	
1 insert		No. 260058 CU7010 (or use CC.. 09T3)	
Connection		HW63	
29W	23 7571	Fine boring head Ø 86 – 402 mm	eShop
Ø D ₁	mm	80	
L ₁	mm	89.5	
		242-402	
29W	23 7573	Insert holder for boring range Ø 242 – 402 mm	eShop



23 7570_HW63



23 7571_HW63



23 7573_242-402

Garant Digital display unit for precision boring heads

External digital measuring instrument for GARANT fine boring heads. Electronics and power supply are contained within the display unit, so it can be installed in a **protected area outside** the machining centre.

Simple and secure attachment with permanent magnet.

Advantage: Suitable for all GARANT digital boring heads.

No electronics or battery in the boring heads, therefore compact installation can be performed.

Application: To 0.001 mm (inch) precise reading on the Ø.

Very high repetition accuracy and zero-play fine adjustment due to the **direct travel measurement system** guarantee optimum measurement reliability and process reliability.

Supplied with: With spare battery.



23 7601

29W	23 7601	Display unit digital	eShop
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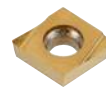
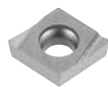
Garant Indexable insert for precision boring systems

Polished inserts for **controlled chip breakage** during precision boring work with small oversize.

Size CU3515 – General purpose for a broad range of applications.

Size HB3010 – Especially for hardened steels, even for stainless.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni	Oil	Water	High pressure	High speed
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K					
CU3515	600	350	250	250	250	220	200	180	H	H	H	H	H	120	120		160	●	●	○	○	○
HB3010	400	300	220	200	185	185	160	150	125	100	80			120	120		160	●	●	○	○	○
HB7015	400	300	220	200	185	185	160	150						120	120		160	●	●	○	○	○



Grade	CU3515	HB3010	HB7015	
21F 23 7695	CCGT 060202L	eShop	eShop	10
21F 23 7696	CCGT 060204L	eShop	–	10
21F 23 7697	CCGT 09T302L	eShop	eShop	10
21F 23 7698	CCGT 09T304L	eShop	–	10
Chip breaker	US	SS	SS	
f	mm/rev.		0.05 – 0.2	

Garant Arbors, extensions and reducers for HW interface

Reducer sleeve Ø 16 mm to 7 mm

Size 16-7 – Shank Ø 16 mm

Application: For micro-boring heads.

Size 16-7 – For indexable inserts and adapters in Ø 7 mm. In connection with boring heads No. 237513; 237546; 237568 and 237591.



237626

Type	16-7
29W 23 7626 Reducer sleeve	eShop

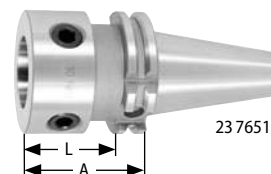
Arbors HW



23 7653/7654 – With Balluff/RFID chip bore.

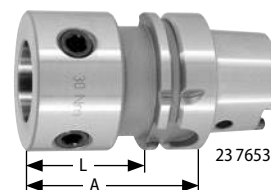
Connection			HW20	HW25	HW32	HW40	HW50	HW63	HW80
21F 23 7651	Arbor	SK 40	eShop	eShop	eShop	eShop	eShop	eShop	–
21F 23 7652		SK 50	–	–	–	–	eShop	eShop	eShop
L		mm	27	27	27	27	27	47	27
Dimension A		mm	46	46	46	46	46	66	46

Form ADB DIN 69871



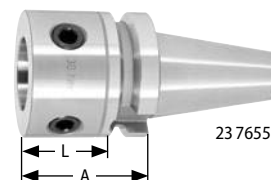
237651

Form A DIN 69893



237653

Form ADB JIS B6339



237655

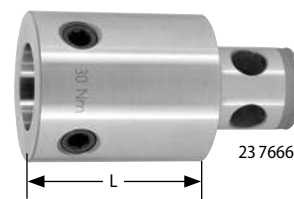
Connection			HW20	HW25	HW32	HW40	HW50	HW63	HW80
21F 23 7653	Arbor	HSK-A 63	eShop	eShop	eShop	eShop	eShop	eShop	–
21F 23 7654		HSK-A 100	–	–	–	–	eShop	eShop	eShop
L (23 7653)		mm	16	16	22	29	39	54	–
L (23 7654)		mm	–	–	–	–	36	51	51
Dimension A		mm	42	42	48	55	65	80	80

Connection			HW20	HW25	HW32	HW40	HW50	HW63	HW80
21F 23 7655	Arbor	BT 40	eShop	eShop	eShop	eShop	eShop	eShop	–
21F 23 7656		BT 50	–	–	–	–	eShop	eShop	eShop
L		mm	27	27	27	27	27	37	37
Dimension A (23 7655)		mm	54	54	54	54	54	64	–
Dimension A (23 7656)		mm	–	–	–	–	65	75	75

Extensions HW



Connection			HW20	HW25	HW32	HW40	HW50	HW63	HW80
29W 23 7666	Extension short		eShop	eShop	eShop	eShop	eShop	eShop	eShop
29W 23 7668			eShop	eShop	eShop	eShop	eShop	eShop	eShop
L (23 7666)		mm	25	30	40	50	50	75	100
L (23 7668)		mm	35	45	60	80	70	135	180

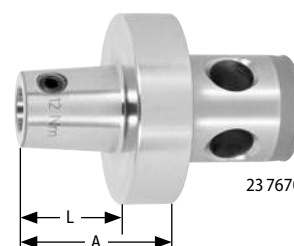


237666

Reducers HW



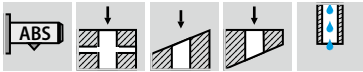
Connection			HW20	HW25	HW32	HW40	HW50
29W 23 7670	Reducer HW50		eShop	eShop	eShop	eShop	–
29W 23 7672			eShop	eShop	eShop	eShop	eShop
L (23 7670)		mm	28	28	28	28	–
L (23 7672)		mm			32		
Dimension A (23 7670)		mm	44	44	44	44	–
Dimension A (23 7672)		mm			50		



237670

KOMET Micro-adjustable head system B301 and precision boring cartridge M302

Micro-adjustable head



With ABS® connection B301 and accepts M302 precision turning cartridge.

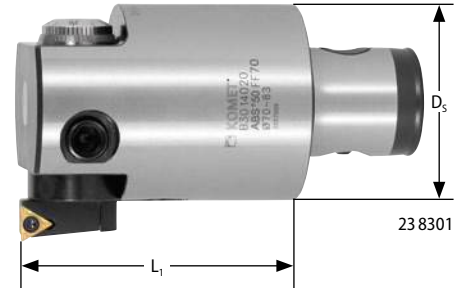
The smallest adjustment is 0.002 mm on the $\varnothing$ using the vernier.

Central coolant supply to the cutting edge.

Application: For bores from $\varnothing$ 29.5 to 121 mm.

For high precision setting, turning cartridge can be adjusted after clamping.

Note: Please order the suitable precision cartridge No. 238310 (M302) and indexable inserts separately.



$\varnothing D_{min}$	248	23 8301	Boring range $\varnothing$	L_1	ABS® $\varnothing D_3$	Application	Insert screw set
		KOMET® micro-adjustable boring head					
mm		B301	mm	mm			
29,5		eShop	29.5 – 36	50	25	238310 10	249900 SW3
35,5		eShop	35.5 – 42	50	25	238310 10	249900 SW3
39		eShop	39 – 45	60	32	238310 20	249900 SW4
44		(eShop)	44 – 50	60	32	238310 20	249900 SW4/10
47		eShop	47 – 57	60	40	238310 30	249900 SW5
56		(eShop)	56 – 66	60	40	238310 30	249900 SW5
58		eShop	58 – 71	70	50	238310 40	249900 SW6
70		eShop	70 – 83	70	50	238310 40	249900 SW6
79		(eShop)	79 – 94	70	63	238310 50	249900 SW8
93		eShop	93 – 108	70	63	238310 50	249900 SW8
100		(eShop)	100 – 121	90	80	238310 60	249900 SW10

Precision boring cartridge

Size 10; 20 – The following are compatible:

No. 268879 K10, 268877 BK6425, 268878 BK6425, 268878 P25M and 268878 BK8425.

Size 30; 40 – The following are compatible:

No. 268880 BK6425, 268881 BK6425, 268881 BK8425, 268887 P25M, 268887 BK8425 and 268887 K10.

Size 50; 60 – The following are compatible:

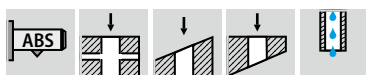
No. 268883 BK6425, 268884 BK8425, 268888 P25M and 268888 BK8425.



Type	24J	23 8310	Suitable for micro-adjustable boring head No. 238301	S	L_1	$\varnothing D_1$	ISO code indexable insert	Set of insert screws
		KOMET® precision cartridge						
		M302		mm	mm	mm		
10		eShop	29.5; 35.5	3.5	28.5	10	TO. X 06T1..	239653 6IP
20		eShop	39; 44	3.5	37.5	12	TO. X 06T1..	239653 6IP
30		eShop	47; 56	5	45	16	TO. X 0902..	239653 8IP3
40		eShop	58; 70	7	56	20	TO. X 0902..	239653 8IP7
50		eShop	79; 93	8	77.5	25	TO. X 1403..	239653 10IP
60		eShop	100; 120	11	97	32	TO. X 1403..	239653 10IP

KOMET Micro-adjustable head system M03Speed μ m-accurate with balancing $\varnothing$ 24.8 to 206.0 mm

Micro-adjustable head

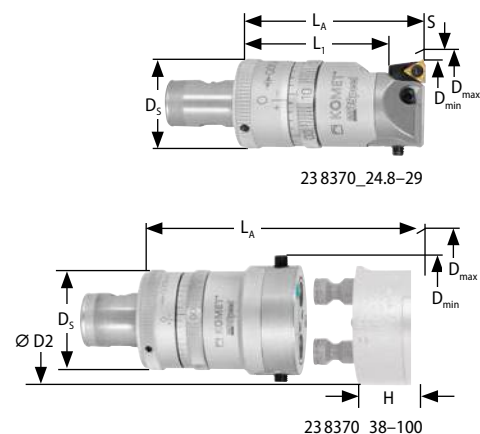


- Dynamic balance in the slide for highest speeds.
- Modular system structure.
- Fine adjustment without additional clamping.
- With ABS® connection for highest changeover accuracy.
- Quick rough adjustment by adjusting the lathe tool.
- Internal coolant supply directed to the cutting edge.
- Smallest adjustment steps in the μ m range, within a fine adjustment range of 0.25 - 0.6 mm on the $\varnothing$, depending on the turning range.
- Fine adjustment steps of 0.002 mm per graduation in $\varnothing$.
- High resolution ensures problem-free adjustment / readability **without** a vernier.

Application:

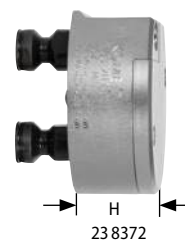
Size 38–100 – In combination with replaceable bridge No. 238372.

Note: Additional insert holders, e.g. for reverse machining and with other angles = 15°, 30°, 45° etc. available on short lead times.
Please order change-over adapters, cartridges, and indexable inserts separately.



$\varnothing D_{min}$	24	23 8370	Boring range $\varnothing$	L_1	ABS® $\varnothing D_s$	Cutter circle $\varnothing D_2$ forwards machining	S	Fine adjustment in $\varnothing$	maximum speed	Cartridge	Change-over adapter
mm		KOMET® M03Speed micro-adjustable boring head	mm	mm	mm	mm	mm	mm	min ⁻¹		
24,8		eShop	24.8 – 33	39.9	25	24.5	4.5	0.25	40000	238355 24,8	—
29		eShop	29 – 39	39.9	25	26	5	0.4	40000	238355 29	—
38		(eShop)	38 – 63	—	32	$\varnothing$ 3.2	—	0.4	31000	238374 38-50	238372 38; 50
62		(eShop)	62 – 103	—	50	55	—	0.6	18500	238374 62-82	238372 62; 82
100		eShop	100 – 206	—	63	85	—	0.6	11500	238374 100-166	238372 100; 128; 166

Replaceable bridge



$\varnothing D_{min}$	24	23 8372	Boring range $\varnothing$	H	Cutter circle $\varnothing D_2$ forwards machining	S	maximum speed	Cartridge	Micro-adjustable boring head
mm		KOMET® replaceable bridge for M03Speed	mm	mm	mm	mm	min ⁻¹		
38		eShop	38 – 51	17.5	$\varnothing$ 3.2	6.5	31000	238374 38-50	238370 38
50		(eShop)	50 – 63	17.5	$\varnothing$ 3.5	6.5	24000	238374 38-50	238370 38
62		(eShop)	62 – 83	23	55	10	18500	238374 62-82	238370 62
82		(eShop)	82 – 103	23	71	10.5	15000	238374 62-82	238370 62
100		(eShop)	100 – 130	26	85	15	11500	238374 100-166	238370 100
128		(eShop)	128 – 169	26	109	20	10000	238374 100-166	238370 100
166		(eShop)	166 – 206	26	166	20.5	8000	238374 100-166	238370 100

Cartridges

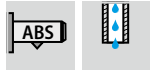
Note:

23 8374 – Only for use in conjunction with replaceable bridge No. 238372.

suitable for M03 Size	24	23 8355	L_1	ISO code indexable insert	Set of insert screws	Micro-adjustable boring head
		KOMET® cartridge 90° for M03Speed	mm			
		Forwards				
24,8		eShop	50	TOHX 06T1..	239653 6IP1	238370 24,8
29		eShop	50	TOHX 06T1..	239653 6IP1	238370 29

suitable for M03 Size	24	23 8374	L_1	ISO code indexable insert	Set of insert screws	Change-over adapter
		KOMET® cartridge 90° for M03Speed	mm			
		Forwards				
38-50		(eShop)	81	TOHX 06T1..	239653 6IP1	238372 38; 50
62-82		(eShop)	103	TOHX 0902..	239653 8IP4	238372 62; 82
100-166		(eShop)	106	TOHX 0902..	239653 8IP4	238372 100; 128; 166





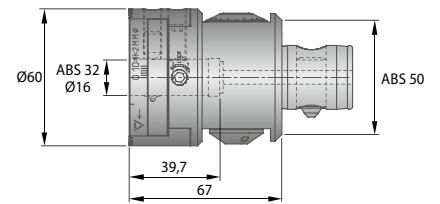
KOMET MicroKom® hi.flex precision boring system Ø 6 – 125 mm

- Adjustment accuracy: 0.01 mm per graduation.
Adjustment accuracy 0.002 mm Ø using the vernier for adjustments up to 5 mm radial.
- Balanced at the 0-position.

Boring range Ø	mm	6-125
240 23 8380	KOMET MicroKom® hi.flex precision boring set	eShop
240 23 8391	KOMET MicroKom® hi.flex precision boring head	eShop
Boring range Ø	mm	6 – 125
Supplied with: 1 fine boring head (23 8380)	No. 238391 ABS50° Ø 6 – 125 mm	
1 each cartridge (23 8380)	KOMET No. 62863 04400 Ø 25 – 44 mm KOMET No. 62863 12500 Ø 44 – 125 mm	
1 bridge (23 8380)	KOMET No. 62860 12500 Ø 90 – 125 mm	
1 serrated body (23 8380)	KOMET No. 62861 06300 Ø 25 – 63 mm	
1 packing piece (23 8380)	KOMET No. 62862 09300	
1 each boring bar (23 8380)	KOMET No. 62850 00600 Ø 6 – 10 mm KOMET No. 62850 01000 Ø 10 – 14 mm KOMET No. 62850 01400 Ø 14 – 18 mm KOMET No. 62850 01800 Ø 18 – 22 mm KOMET No. 62850 02200 Ø 22 – 26 mm	
4 each indexable inserts (23 8380)	TOGX06T102EN-14 BK60 - KOMET No. 62601 90206 TOGX090204EN-14 BK60 - KOMET No. 62601 70409	
2 indexable inserts (23 8380)	WOHX02T2001EL-G12 BK8440 - KOMET No. 62600 00102	
5 socket-head screws (23 8380)	KOMET No. 62950 00000 - M5×16 mm	
1 each hexagon key L-wrench (23 8380)	5IP; 6IP; 8IP; SW3; SW4	



23 8380



KOMET MicroKom BluFlex® 2 precision boring system with Bluetooth® technology Ø 6 – 125 mm

- Linearity range: -0.2 to +4.4 mm (-0.0079 to 0.1732 inch) on the Ø.
- µ-precise display resolution: 0.001 mm on the Ø.
- Internal hexagon wrench allows radial adjustment and clamping of the micro-adjustable drilling head.
- Modern high-contrast OLED display directly at the micro-adjustable drilling head.
- The display can be rotated through 180°.
- Easy to operate directly at the touch display.
- Additional Bluetooth® low energy interface for easy display on a commercially-available smartphone with Android™ or iOS 7.
- Higher speeds thanks to integral partial balancing.
- Very sensitive adjustment permits precise infeed.
- Absolute travel measuring system – the absolute and relative slide position is output every time the device is switched on.
- Universal ABS® port.
- Battery easily replaceable.
- 1: 1 compatible with the available variations of the previous system.

Boring range Ø	mm	6-125
27G 23 8398	KOMET MicroKom® BluFlex® 2 precision boring set	eShop
Boring range Ø	mm	6 – 125
Supplied with: 1 fine boring head	No. 238392	
1 each cartridge	KOMET No. 62863 04400 Ø 25 – 44 mm KOMET No. 62863 12500 Ø 44 – 125 mm	
1 bridge	KOMET No. 62860 12500 Ø 90 – 125 mm	
1 serrated body	KOMET No. 62861 06300 Ø 25 – 63 mm	
1 packing piece	KOMET No. 62862 09300	
1 each boring bar	KOMET No. 62850 00600 Ø 6 – 10 mm KOMET No. 62850 01000 Ø 10 – 14 mm KOMET No. 62850 01400 Ø 14 – 18 mm KOMET No. 62850 01800 Ø 18 – 22 mm KOMET No. 62850 02200 Ø 22 – 26 mm	
4 each indexable inserts	TOGX06T102EN-14 BK60 - KOMET-No. 62601 90206 TOGX090204EN-14 BK60 - KOMET-No. 62601 70409	
2 indexable inserts	WOHX02T2001EL-G12 BK8440 - KOMET-No. 62600 00102	
5 socket-head screws	KOMET No. 62950 00000 - M5×16 mm	
1 each hexagon key L-wrench	5IP; 6IP; 8IP; SW3; SW4	

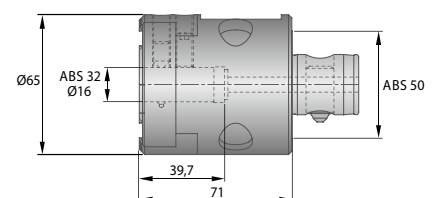
27G 23 8392	Fine boring head MicroKom® BluFlex® 2	(eShop)
Boring range Ø	mm	6 – 125



23 8398



23 8398



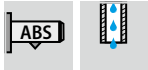
KOMET Bridges for Ø extension 120 - 365 mm

Suitable for: MicroKom® hi.flex No. 238380 6 – 125 and No. 238391 6 – 125 as well as MicroKom BluFlex® 2 No. 238398 6 – 125 and No. 238392.

Boring range Ø	mm	90-125	120-155	150-185	180-215	210-245	240-275	270-305	300-335	330-365
24Z 23 8395	Bridge for MicroKom® hi.flex and MicroKom BluFlex® 2	(eShop)	eShop	eShop	eShop	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)



23 8395



Garant Arbors with ABS® connection

Note: Further arbors with ABS® connection on request.

Arbors

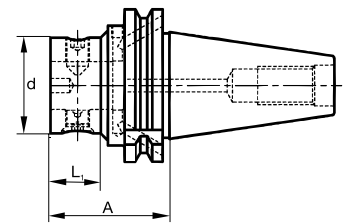
SK 40 / 50

DIN 69871	Form ADB	G 6.3 8000 min ⁻¹
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Supplied with: Complete with sealing washer and conversion set for form AD.



23 8420



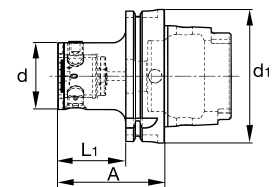
ABS° Ø d		mm	32	40	50	63	80	100
29W	Arbor	SK 40	eShop	eShop	eShop	eShop	—	—
29W		SK 50	—	eShop	eShop	eShop	eShop	eShop
A (23 8420)		mm	50	50	50	90	—	—
A (23 8440)		mm	—	60	60	60	70	115
L ₁ (23 8420)		mm	19	19	30	70	—	—
L ₁ (23 8440)		mm	—	20	22	29	50	95

Arbors

HSK A63 / 100

 DIN
69893


23 8500

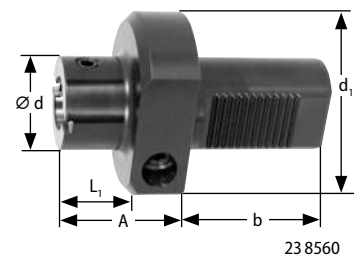


ABS® Ø d	mm	25	32	40	50	63	80	Ø d ₁ mm
29W 23 8500	Arbor	HSK-A 63	eShop	eShop	eShop	eShop	eShop	63
29W 23 8520	Arbor	HSK-A 100	—	—	eShop	eShop	eShop	100
A (23 8500)	mm	50	50	60	70	80	—	—
A (23 8520)	mm	—	—	80	80	80	90	—
L ₁ (23 8500)	mm	24	24	34	44	—	—	—
L ₁ (23 8520)	mm	—	—	51	51	51	61	—

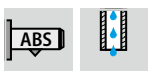
Arbor

VDI 40

ABS® Ø d		mm	50	Ø d ₁ mm
23B	23 8560	Arbor	VDI 40	eShop
A		mm	60	83
L ₁		mm	38	
b		mm	63	

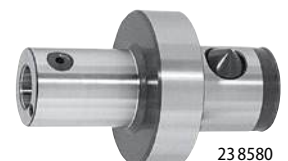


23 8560

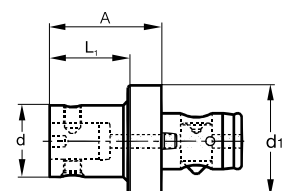


Garant Reducers with ABS® connection

Application: For reducing of nominal arbor ABS 50 to ABS Ø d.



23 8580

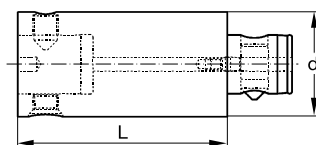


ABS® Ø d	mm	25	32	40
23B 23 8580	Reducer ABS 50	eShop	eShop	eShop
Ø d ₁	mm	—	50	—
A	mm	—	50	—
L ₁	mm	—	35	—



Garant Extensions with ABS® connection

Note: Other lengths and reduced weight extensions as well as torsional vibration dampers for ABS® are available on request.



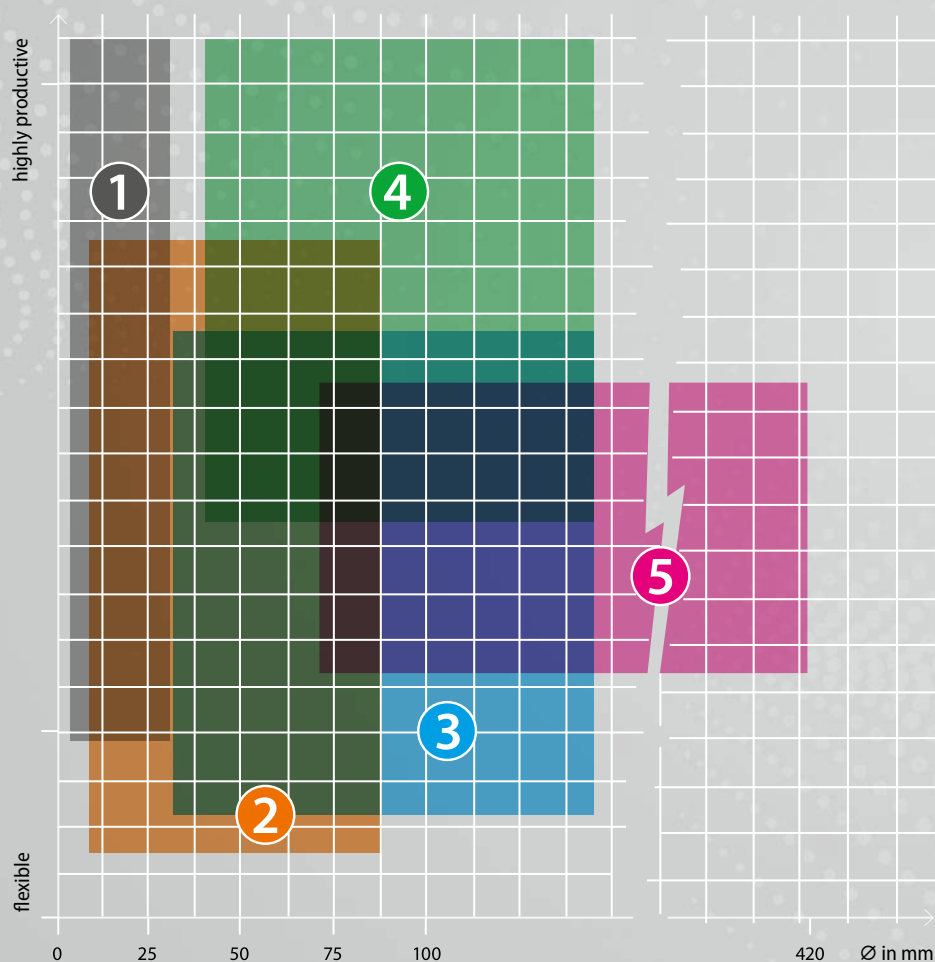
23 8660

ABS® Ø d	mm	25	40	50	63	80	Length L mm
23B 23 8600	Extension	–	eShop	–	–	–	40
23B 23 8620		eShop	–	–	–	–	45
23B 23 8640		–	–	eShop	–	–	50
23B 23 8660		eShop	–	–	eShop	–	60
23B 23 8680		–	–	eShop	–	–	65
23B 23 8700		–	–	–	–	eShop	70
23B 23 8720		–	–	eShop	–	–	100
23B 23 8740		–	–	–	eShop	eShop	125
23B 23 8760		–	–	eShop	–	–	150

Garant FLEXIBLE ON BOTH SIDES: VARIABLE TO THE MACHINE, TAILORED TO THE APPLICATION.

The GARANT boring system offers you the variability that you need for your production – with the essential machine connections and boring diameters ranging from 0.3 mm to 420 mm.

Whether flexible or highly productive, small or large holes – the GARANT solutions at a glance:



1 23 7490



2 23 7586_HW63



3 23 7515_HW63



4 23 7600_HW50



5 23 7570_HW63



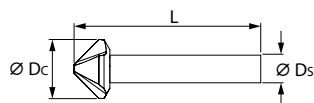


Garant Countersink 120° and 100°

Easy and chatter-free deburring and countersinking.

15 0025 – Very **sturdy version** with **solid carbide head**, for heavy-duty use. Specially for **materials that are difficult to machine**.

15 0020/0023 – Flutes ground from solid.



HSS



15 0020



HSS



15 0023



Solid carbide



15 0025

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	Ti > 850 N	Inconel*	GRP	CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	S	S	N	N					
15 0020/0023	70	33		28	27																		
15 0025															6	5	5	5					

External Ø D _c	15 0020	15 0023	15 0025	Number of cutting edges Z		smallest countersink Ø for holes from		L		Ø D _s	Inconel*
	Countersink HSS		Countersink solid carbide	15 0020	15 0025	15 0020	15 0023	15 0020	15 0023		
	120°	100°	100°	15 0020	15 0025	15 0020	15 0023	15 0020	15 0023		
mm						mm	mm	mm	mm	mm	mm/rev.
8	eShop	eShop	–	3	–	2	2	49	49	6	0.09
10,4	–	eShop	–	3	–	–	2.5	–	49	6	0.12
12,4	–	eShop	eShop	3	5	4	3	55	55	8	0.12
12,5	eShop	–	–	3	–	2.8	–	54	–	8	0.12
16	eShop	–	–	3	–	3.2	–	57	–	10	0.14
16,5	–	eShop	eShop	3	5	4.5	3.5	58	59	10	0.14
20	eShop	–	–	3	–	3.5	–	59	–	10	0.16
20,5	–	eShop	eShop	3	5	5	4	61	62	10	0.16
25	eShop	eShop	–	3	–	3.8	5	63	65	10	0.2



HSS



Garant Countersink 90°

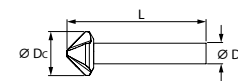
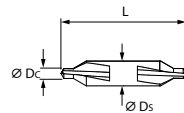
Axial-radial relief ground conical profile for chatter-free deburring and countersinking. This delivers a high-quality countersinking surface. Generous-sized flutes for very good chip clearance. Can be reground easily on the inner flat faces of the flutes.



Size 6 double-ended cutting



15 0050



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
15 0050		33		28	27									7									

External Ø D _c	mm	6	8	12,5	16	20	25	31,5
15 0050	Countersink single flute 90°	eShop	eShop	eShop	eShop	eShop	eShop	eShop
L	mm	45	50	50	56	60	75	80
Shank Ø D _s	mm	6	8	8	10	10	12	12



HSS



Garant Deburring countersink 90°

Special cutter geometry for an easy peeling cut. The swarf is evacuated via the oblique hole towards the shank.



15 0065

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
15 0065		33		28	17									7									

Type		5	10	15	20	25
 15 0065	Deburring countersink 90°	eShop	eShop	eShop	eShop	eShop
for hole Ø	mm	2 – 5	5 – 10	10 – 15	15 – 20	20 – 25
Head Ø	mm	10	14	20	28	30
L	mm	46	55	65	85	95
Ø D _s	mm	6	8	10	12	15

Deburring countersink set

15 0070	Deburring countersink set No. 150065 in a case 90°	eShop
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15 0070



Garant High-precision countersink 90° with unequal spacing

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
15 0130/0132	75	75	50	65	50	30	18	8	8	8	8	16	10	12	25	60	○	●					

High-precision countersink 90° with unequal spacing



HSS



3

DIN 335 C

All countersinks have 3 cutting edges. Special geometry with extremely unequal spacing and matching cutting edge preparation. Radially relief ground. Flutes ground from solid. Newly developed **special TiAlN coating** for long service life.

High-precision countersink, produced with tight manufacturing tolerances similar to DIN 335-C.

15 0132 – Three **drive flats** on the shank for use in a 3-jaw chuck.

Advantage: Very smooth cutting throughout the entire countersinking operation. Chatter-free running for perfect results and **optimum tool service life**.

Application: High-precision countersinks for production of **exactly round 90° countersunk surfaces**.



15 0130

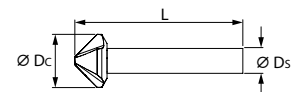


15 0132



Shank with 3 drive flats.

Extremely unequal spacing
(cutting edges
arranged
at unequal intervals).



External Ø D _c	15 0130	15 0132	smallest countersink Ø for holes from	L	Ø D _s	for countersink screws ISO 2009, 2010, 7046, 7047	for countersink screws DIN 7991	
	Precision countersink with unequal spacing	High-precision countersink with unequal spacing and 3 drive flats						
mm	TiAlN	TiAlN	mm	mm	mm			mm/rev.
4,3	eShop	eShop	1.3	40	4	M2	—	0.08
6	eShop	eShop	1.5	45	5	M3	—	0.1
6,3	eShop	eShop	1.5	45	5	—	M3	0.1
8	eShop	eShop	2	50	6	M4	—	0.1
8,3	eShop	eShop	2	50	6	—	M4	0.1
10	eShop	eShop	2.5	50	6	M5	—	0.13
10,4	eShop	eShop	2.5	50	6	—	M5	0.13
11,5	eShop	eShop	2.8	56	8	M6	—	0.13
12,4	eShop	eShop	2.8	56	8	—	M6	0.13
15	eShop	eShop	3.2	60	10	M8	—	0.13
16,5	eShop	eShop	3.2	60	10	—	M8	0.18
19	eShop	eShop	3.5	63	10	M10	—	0.18
20,5	eShop	eShop	3.5	63	10	—	M10	0.22
23	eShop	eShop	3.8	67	10	M12	—	0.22
25	eShop	eShop	3.8	67	10	—	M12	0.25
31	eShop	eShop	4.2	71	12	—	M16	0.25

Sets of high-precision 90° countersinks



HSS



3

DIN 335 C

150301
150305150303
150307

15 0301/0305 – High-precision countersink No. 150130.

15 0303/ 0307 – High-precision countersink No. 150132. All countersinks **also have 3 drive flats** on the shank for use in a 3-jaw chuck.

Advantage: Very smooth cutting throughout the entire countersinking operation. Chatter-free running for perfect results and **optimum tool service life**.

Application: High-precision countersinks for production of **precise, round 90° countersunk surfaces**.

Supplied with:

15 0301/0303 – 5-piece precision countersink set in a **round box**.

15 0305/0307 – 5-piece precision countersink set in a **case**.

15 0301
15 030315 0305
15 0307

Number of countersinks			5
15 0301	High-precision countersink set No. 150130 in a box 90°	TiAlN	eShop
15 0303	High-precision countersink set with 3 drive flats No. 150132 in a box 90°	TiAlN	eShop
Content: 1 pc. each countersink			Size 6.3; 10.4; 12.4; 16.5; 20.5
Number of countersinks			5
15 0305	High-precision countersink set No. 150130 in a case 90°	TiAlN	eShop
15 0307	High-precision countersink set with 3 drive flats No. 150132 in a case 90°	TiAlN	eShop
Content: 1 pc. each countersink			Size 6.3; 10.4; 16.5; 20.5; 25

Case

for number of countersinks			5
15 0368	Empty case		eShop



15

Garant Countersink 90°

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
15 0150/0152	70	33		28	27	27								9	8		80			●		○	
15 0170			25	34	32	32												●		●		○	

Countersink 90°



HSS



DIN 335 C

All countersinks have 3 cutting edges, radially relieved.

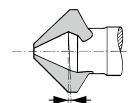
Flutes are ground from solid.

15 0152 – Three **drive flats on the shank** for use in a 3-jaw chuck.

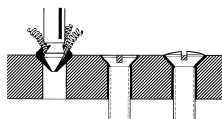
15 0170 – Precision countersink for considerable performance improvement.

15 0150/0152 – High-precision countersink, produced with tight manufacturing tolerances similar to DIN 335-C.

Application: High precision countersinks for chatter-free countersinking.



Relief ground



Three-flute countersinks for accurately centred countersinking



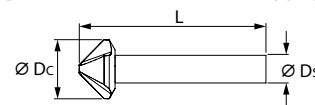
15 0150



15 0152



15 0170



External Ø D _c	15 0150	15 0152	15 0170	smallest countersink Ø for holes from	L	Ø D _s	for countersunk screws ISO 2009, 2010, 7046, 7047	for countersunk screws DIN 7991	 < 500 N f
	High-precision countersink								
	90°								
mm			TiAlN	mm	mm	mm			mm/rev.
4,3	eShop	–	eShop	1.3	40	4	M2	–	0.07
5	eShop	–	eShop	1.5	40	4	M2.5	–	0.07
6	eShop	eShop	eShop	1.5	45	5	M3	–	0.09
6,3	eShop	eShop	eShop	1.5	45	5	–	M3	0.09
7	eShop	eShop	eShop	1.8	50	6	M3.5	–	0.09
8	eShop	eShop	eShop	2	50	6	M4	–	0.09
8,3	eShop	eShop	eShop	2	50	6	–	M4	0.09
10	eShop	eShop	eShop	2.5	50	6	M5	–	0.12
10,4	eShop	eShop	eShop	2.5	50	6	–	M5	0.12
11,5	eShop	eShop	eShop	2.8	56	8	M6	–	0.12
12,4	eShop	eShop	eShop	2.8	56	8	–	M6	0.12
15	eShop	eShop	eShop	3.2	60	10	M8	–	0.12
16,5	eShop	eShop	eShop	3.2	60	10	–	M8	0.14
19	eShop	eShop	eShop	3.5	63	10	M10	–	0.14
20,5	eShop	eShop	eShop	3.5	63	10	–	M10	0.16
23	eShop	eShop	eShop	3.8	67	10	M12	–	0.16
25	eShop	eShop	eShop	3.8	67	10	–	M12	0.2
31	eShop	eShop	eShop	4.2	71	12	–	M16	0.2
40	eShop	eShop	eShop	10	75	12	–	–	0.25

Countersink sets 90°



HSS



DIN 335 C

h9

h9

Countersink sets, **in a case**.

Practical set for assembly and workshop use.

Number of countersinks		6	7	17
15 0310	Countersink set No. 15 0150 in a case 90°	eShop	eShop	eShop
15 0312	Countersink set No. 15 0152 in a case 90°	eShop	eShop	–
15 0315	Countersink set No. 15 0170 in a case 90°	eShop	eShop	eShop
				TiAlN
Content: 1× each countersink		Size 6; 8; 10; 11.5; 15; 19	Size 6; 8; 10; 11.5; 15; 19; 25	Size 4.3; 5; 6; 6.3; 7; 8; 8.3; 10; 10.4; 11.5; 12.4; 15; 16.5; 19; 20.5; 23; 25



15 0310



15 0370

Case

for number of countersinks		6
15 0370	Empty case for 6 or 7 countersinks	eShop



HOLEX Countersink 90°

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si									INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
15 0175	70	33		28	27	27	8															
15 0182/0184	75	70			50	40	20	15	8				18	15	12	20	20	●	●		○	○

Countersink 90°

All countersinks have 3 cutting edges, radially relieved. Flutes are ground from solid.

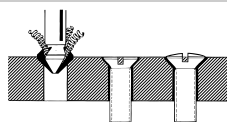
150175 – Economy countersink version.

15 0184 – Three drive flats on the shank for use in a 3-jaw chuck.

15 0182/0184 – **HOLEX Pro Steel:**

- Exact machining results in **manual** and **machine use**.
- **Chatter-free running** through **extremely unequal spacing** of the cutting edges for high-quality surfaces.
- Optimum tool life thanks to **TiALN high-performance coating**.
- High **process reliability** due to optimised **chip evacuation**.
- Attractive cost/benefit ratio.

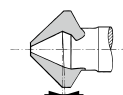
Application: High-precision countersink for chatter-free 90° countersinking.



Three-flute countersinks for accurate centring.



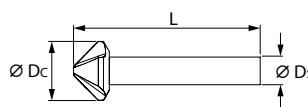
150175



Relief around



150182



150184

External Ø D _c	12M	15 0175	12M	15 0182	12M	15 0184	smallest countersunk Ø for holes from	L	Ø D _s	for countersunk screws ISO 2009, 2010, 7046, 7047	for countersunk screws DIN 7991	
	Countersink	HOLEX Pro Steel high-precision countersink with unequal spacing	HOLEX Pro Steel high-precision countersink with unequal spacing and 3 drive flats	mm	mm	mm						mm/rev.
mm		TiAlN		TiAlN								
4,3	eShop	eShop		eShop	1.3	40	4	M2	—		0.07	
5	eShop	—		—	1.5	40	4	M2.5	—		0.07	
6	eShop	eShop		eShop	1.5	45	5	M3	—		0.09	
6,3	eShop	eShop		eShop	1.5	45	5	—	M3		0.09	
7	eShop	—		—	1.8	50	6	M3.5	—		0.09	
8	eShop	eShop		eShop	2	50	6	M4	—		0.09	
8,3	eShop	eShop		eShop	2	50	6	—	M4		0.09	
10	eShop	eShop		eShop	2.5	50	6	M5	—		0.12	
10,4	eShop	eShop		eShop	2.5	50	6	—	M5		0.12	
11,5	eShop	eShop		eShop	2.8	56	8	M6	—		0.12	
12,4	eShop	eShop		eShop	2.8	56	8	—	M6		0.12	
15	eShop	eShop		eShop	3.2	60	10	M8	—		0.12	
16,5	eShop	eShop		eShop	3.2	60	10	—	M8		0.14	
19	eShop	eShop		eShop	3.5	63	10	M10	—		0.14	
20,5	eShop	eShop		eShop	3.5	63	10	—	M10		0.16	
23	eShop	eShop		eShop	3.8	67	10	M12	—		0.16	
25	eShop	eShop		eShop	3.8	67	10	—	M12		0.2	
31	eShop	eShop		eShop	4.2	71	12	—	M16		0.2	

Countersink sets 90°

Countersink sets **in a case.** Handy for assembly and workshop use.

Note: Empty case for 6 or 7 countersinks, see No. 150370.

Catalogue page 204

Number of countersinks			5	6	7	17
12M	15 0320	Countersink set No. 150175 in a case 90°	—	eShop	eShop	eShop
12M	15 0342	HOLEX Pro Steel countersink set No. 150182 in a case 90°	TiAIN	—	eShop	eShop
12M	15 0343	HOLEX Pro Steel countersink set No. 150182 in a round box 90°	TiAIN	eShop	—	—
12M	15 0344	HOLEX Pro Steel countersink set with 3 drive flats No. 150184 in a case 90°	TiAIN	—	eShop	eShop
12M	15 0345	HOLEX Pro Steel countersink set with 3 drive flats No. 150184 in a round box 90°	TiAIN	eShop	—	—
Content: 1× each countersink			Sizes 6.3; 10.4; 12.4; 16.5; 20.5	Size 6; 8; 10; 11.5; 15; 19	Size 6; 8; 10; 11.5; 15; 19; 25	Size 4.3; 5; 6; 6.3; 7; 8; 8.3; 10; 10.4; 11.5; 12.4; 15; 16.5; 19; 20.5; 23; 25



15 0320



15 0343



Garant Countersink 90°

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
15 0371/0372	70	33	20	28	27	27																	
15 0376/0377	75	75	50	65	50	30	18	8	8			16	10	12	25	60	○	●		●		○	

Countersink 90°, long

All countersinks have 3 cutting edges, radially relief ground. Flutes ground from solid.

High-precision countersink, produced to tight manufacturing tolerances similar to DIN 335-C with long plain shank.

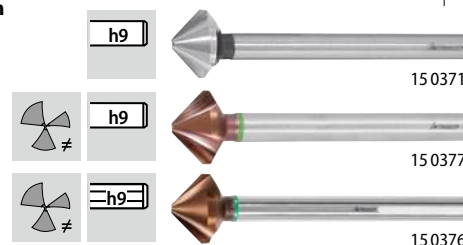
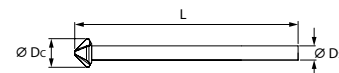
15 0376 – Three **drive flats on the shank** for use in a 3-jaw chuck.

15 0377/0376 – **Special geometry with extremely unequal spacing** and matching cutting edge preparation.

Newly developed, **special TiAlN coating** for long tool life.

Application:

15 0377/0376 – High-precision countersinks for chatter-free production of **precise, round 90° countersunk surfaces**.

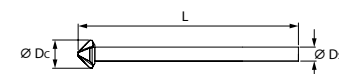


External Ø D _c	15 0371	15 0377	15 0376	smallest countersink Ø for holes from	L	Ø D _s	for counter- sunk screws DIN 7991	15 0371 mm/rev.	15 0377 15 0376 mm/rev.
	High-precision countersink, long		High-precision countersink, long, with 3 drive flats						
			90°						
mm		TiAlN	TiAlN	mm	mm	mm			
6,3	eShop	eShop	eShop	1.5	104	5	M3	0.09	0.1
8,3	eShop	eShop	eShop	2	105	6	M4	0.09	0.1
10,4	eShop	eShop	eShop	2.5	107	6	M5	0.12	0.13
12,4	eShop	eShop	eShop	2.8	108	8	M6	0.12	0.13
16,5	eShop	eShop	eShop	3.2	111	10	M8	0.14	0.18
20,5	eShop	eShop	eShop	3.5	114	10	M10	0.16	0.22
25	eShop	eShop	eShop	3.8	118	10	M12	0.2	0.25
31	eShop	eShop	eShop	4.2	140	12	M16	0.2	0.25

Countersink 90°, extra long

All countersinks have 3 cutting edges, radially relief ground. Flutes ground from solid.

High-precision countersink, produced to tight manufacturing tolerances similar to DIN 335-C with extra long plain shank.



External Ø D _c	15 0372	smallest countersink Ø for holes from	L	Ø D _s	for counter- sunk screws DIN 7991	15 0372 mm/rev.
	High-precision countersink, extra long					
	90°					
mm		mm	mm	mm		
6,3	eShop	1.5	154	5	M3	0.09
8,3	eShop	2	155	6	M4	0.09
10,4	eShop	2.5	157	6	M5	0.12
12,4	eShop	2.8	158	8	M6	0.12
16,5	eShop	3.2	161	10	M8	0.14
20,5	eShop	3.5	164	10	M10	0.16
25	eShop	3.8	168	10	M12	0.2
31	eShop	4.2	190	12	M16	0.2

Countersink sets 90°

Handy for assembly and workshop use.

15 0369 – High-precision countersink No. 15 0376, **with long shank with 3 drive flats**.

15 0373 – Countersink No. 15 0371, **with long shank**.

15 0374 – Countersink No. 15 0372, **with extra-long shank**.

15 0375 – High-precision countersink No. 15 0377, **with long shank**.

Application:

15 0375/0369 – High-precision countersinks for chatter-free production of **precise, round 90° countersunk surfaces**.

Supplied with: 6-piece countersink set in a case.

Number of countersinks			6
TiM	15 0373	Countersink set, long No. 150371 in a case 90°	eShop
TiM	15 0374	Countersink set, extra long, No. 150372 in a case 90°	eShop
TiM	15 0375	High-precision countersink set, long No. 150377 in a case 90°	TiAlN eShop
TiM	15 0369	High-precision countersink set with 3 drive flats, long, No. 150376 in a case 90°	TiAlN eShop
Content: 1× each countersink			Size 6.3; 8.3; 10.4; 12.4; 16.5; 20.5

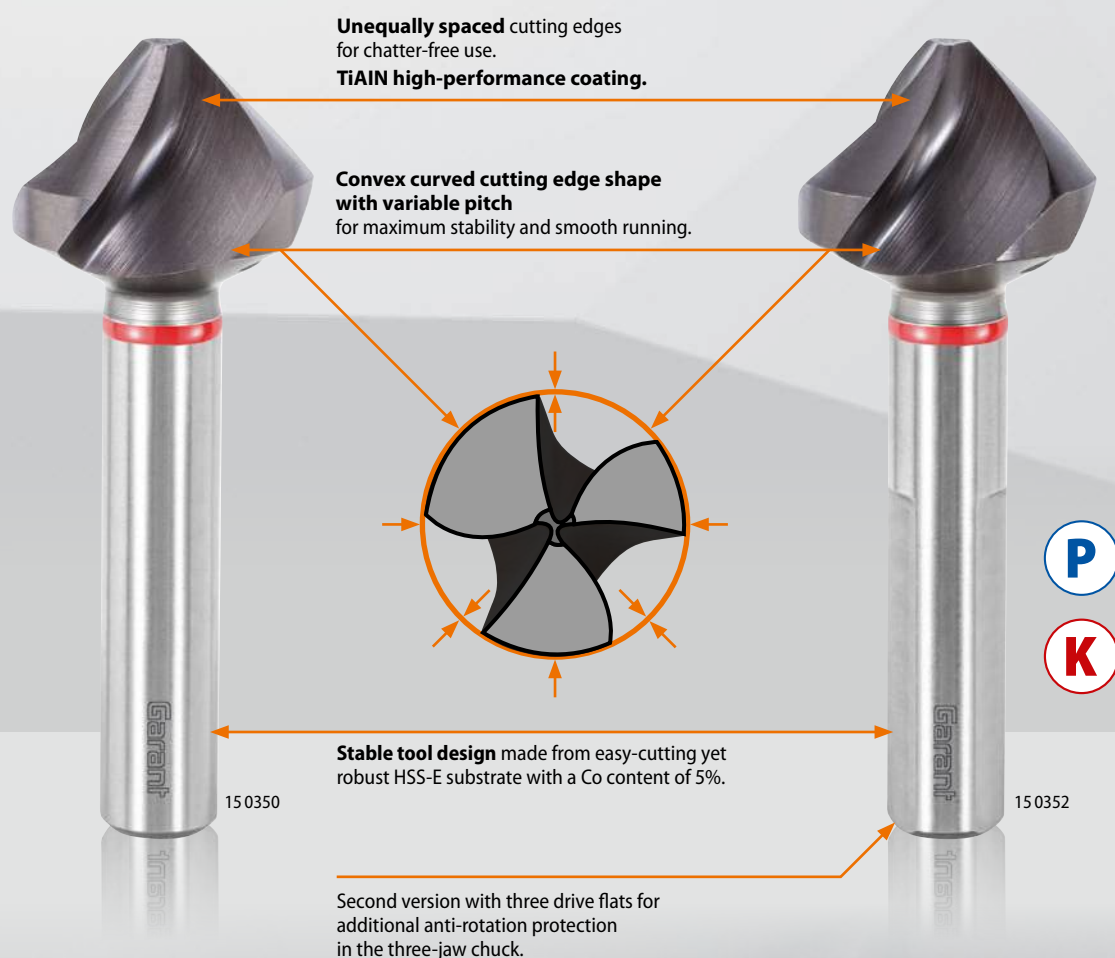


Garant MASTER STEEL^{HT}

MASTERFUL COUNTERSINKS IN STEEL AND CAST MATERIALS.

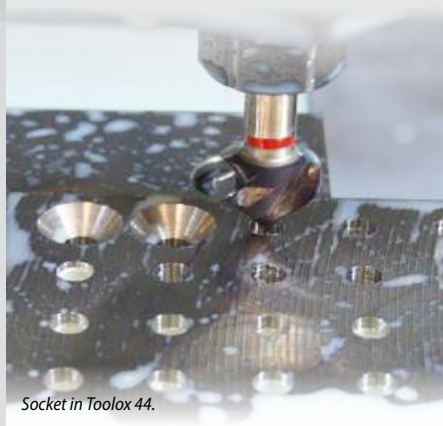
Up to 1400 N/mm² tensile strength.

- Impressive performance in Toolox 44 and HARDOX 500.
- Conditional use in stainless steels, non-ferrous metals and titanium.
- A wide range of applications in manual mode and in the machining centre.



15

Excellent countersinking results in Toolox 44 and HARDOX 500.



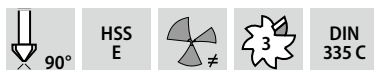
Available in the diameter range from 6.3 mm to 40 mm.

Two set versions with parallel shank and 3 drive flats – each in sizes 5 and 6.

Individual tools included:

Size 5	6.3	10.4	16.5	20.5	25	
Size 6	6.3	8.3	10.4	12.4	16.5	20.5





Garant Master Steel HT high-precision countersink 90° with unequal spacing

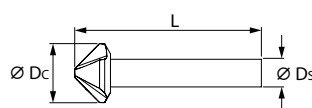
Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si								TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	HARDOX [®] 500 < 1600 N	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	K	○	●	○	○	○
15 0350–15 0356	72	58	42	35	31	19	15				14	13	10	17	13	10	29					

GARANT MasterSteel^{HT} high-precision countersink 90° with unequal spacing

Countersinks with 3 convex unequally spaced cutting edges for chatter-free countersinking and deburring. Robust design and special geometry with variable pitch of the spiral cutting edges for the highest demands – even in difficult-to-machine materials such as Toolox 44 and Hardox 500. Significantly reduced radial and axial forces. Manufactured with narrower production tolerances than specified by DIN335-C.

Advantage: High self-guidance and stability due to the convex cutting edge geometry. Chatter-free running for excellent results with long tool life at the same time.

Application: High-precision countersinks for production of exactly round 90° countersunk surfaces in steel, cast iron and materials that are challenging to machine. Exceptionally well suited for use on hand-held power drills and single-pillar drilling machines.



15 0350



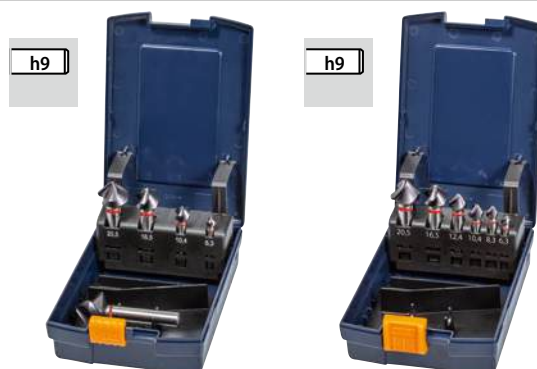
15 0352

External Ø D _c	15B 15 0350	15B 15 0352	smallest counter-sink Ø for holes from	L	Ø D _s	for countersunk screws ISO 2009, 2010, 7046, 7047	for countersunk screws DIN 7991	 < 1400 N f
	GARANT MasterSteel ^{HT} high-precision countersink with unequal spacing							
	90°							
mm	TiAlN	TiAlN	mm	mm	mm			mm/rev.
6,3	eShop	eShop	2	45	5	–	M3	0.08
8	eShop	eShop	2.5	50	6	M4	–	0.08
8,3	eShop	eShop	2.5	50	6	–	M4	0.08
10	eShop	eShop	3	50	6	M5	–	0.08
10,4	eShop	eShop	3	50	6	–	M5	0.09
11,5	eShop	eShop	3.3	56	8	M6	–	0.09
12,4	eShop	eShop	3.3	56	8	–	M6	0.1
15	eShop	eShop	3.7	60	10	M8	–	0.1
16,5	eShop	eShop	3.7	60	10	–	M8	0.1
19	eShop	eShop	4.5	63	10	M10	–	0.1
20,5	eShop	eShop	4.5	63	10	–	M10	0.12
23	eShop	eShop	4.8	67	10	M12	–	0.12
25	eShop	eShop	4.8	67	10	–	M12	0.13
31	eShop	eShop	5.2	71	12	–	M16	0.13
40	eShop	eShop	12	75	12	–	M24	0.13

GARANT MasterSteel^{HT} high-precision countersink sets 90°

Countersink sets in a case. Handy for assembly and workshop use.

Note: Empty case for 5 countersinks, see No. 150368 5 commodity group 15.



150354_5

150354_6

Number of countersinks	5	6
15B 15 0354 GARANT MasterSteel ^{HT} countersink set No. 150350 in a case 90° TiAlN	eShop	eShop
15B 15 0356 GARANT MasterSteel ^{HT} countersink set with 3 drive flats No. 150352 in a case 90° TiAlN	eShop	eShop
Content: 1 pc. each countersink	Sizes 6.3; 10.4; 16.5; 20.5; 25	Size 6.3; 8.3; 10.4; 12.4; 16.5; 20.5



HSS

E



DIN

335 C

Garant

Countersink 90°, for stainless and acid-resistant steels

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
15 0378	70	33	25	28	27	27	8	4						7	7	7	12	65					
15 0389/0393	53	40	35	55	30	25	15	12						18	13	13	30	42					

Countersink 90°, for stainless and acid-resistant steels

All countersinks have 3 cutting edges, radially relieved.

Flutes are ground from solid.

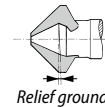
High-precision countersink, produced with tight manufacturing tolerances similar to DIN 335-C.

15 0393 – Three **drive flats on the shank** for use in a 3-jaw chuck.

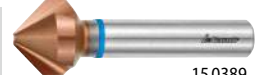
15 0389/0393 – Special geometry with **unequal spacing** and matching cutting edge preparation.
Newly developed AITiCN coating especially for **stainless steels**.

Application:

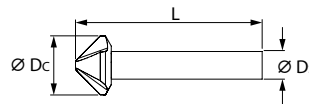
15 0389/0393 – High-precision countersinks for chatter-free production of **precise, round 90° countersunk surfaces**.



15 0378



15 0389



15 0393

External Ø D _c	11M	15 0378	11M	15 0389	11M	15 0393	smallest counter-sink Ø for holes from	L	Ø D _s	for countersunk screws ISO 2009, 2010, 7046, 7047	for countersunk screws DIN 7991	INOX f f	
	High-precision countersink	High-precision countersink with unequal spacing	High-precision countersink with unequal spacing and 3 drive flats	15 0378	15 0389								
				90°	15 0393								
mm		AITiCN		AITiCN	mm	mm	mm					mm/rev.	mm/rev.
4,3	eShop	eShop		eShop	1.3	40	4	M2	—			0.08	0.1
5	eShop	—		—	1.5	40	4	M2.5	—			0.08	—
6	eShop	eShop		eShop	1.5	45	5	M3	—			0.1	0.1
6,3	eShop	eShop		eShop	1.5	45	5	—	M3			0.1	0.1
7	eShop	—		—	1.8	50	6	M3.5	—			0.1	—
8	eShop	eShop		eShop	2	50	6	M4	—			0.1	0.1
8,3	eShop	eShop		eShop	2	50	6	—	M4			0.1	0.1
10	eShop	eShop		eShop	2.5	50	6	M5	—			0.12	0.1
10,4	eShop	eShop		eShop	2.5	50	6	—	M5			0.12	0.1
11,5	eShop	eShop		eShop	2.8	56	8	M6	—			0.12	0.1
12,4	eShop	eShop		eShop	2.8	56	8	—	M6			0.12	0.1
15	eShop	eShop		eShop	3.2	60	10	M8	—			0.12	0.12
16,5	eShop	eShop		eShop	3.2	60	10	—	M8			0.14	0.12
19	eShop	eShop		eShop	3.5	63	10	M10	—			0.14	0.12
20,5	eShop	eShop		eShop	3.5	63	10	—	M10			0.16	0.14
23	eShop	—		—	3.8	67	10	M12	—			0.16	—
25	eShop	eShop		eShop	3.8	67	10	—	M12			0.18	0.2
31	eShop	eShop		eShop	4.2	71	12	—	M16			0.18	0.24

Countersink sets 90°, for stainless and acid-resistant steels

h9

Countersink sets, in a case.

Practical set for assembly and workshop use.

Application:

15 0391/0394 – High-precision countersinks for chatter-free production of **precise, round 90° countersunk surfaces**.

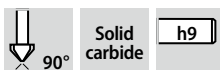
Note:

Size 7 – Supplied in a case No. 150370 **size 6**.

Number of countersinks		6	7	17
15 0381	Countersink set No. 150378 in a case 90°	eShop	eShop	eShop
15 0391	Countersink set No. 150389 in a case 90°	AITiCN eShop	eShop	–
15 0394	Countersink set No. 150393 with 3 drive flats, in a case 90°	AITiCN eShop	eShop	–
Content:		Size 6; 8; 10; 11.5; 15; 19	Size 6; 8; 10; 11.5; 15; 19; 25	Size 4.3; 5; 6; 6.3; 7; 8; 8.3; 10; 10.4; 11.5; 12.4; 15; 16.5; 19; 20.5; 23; 25



15 0391



Garant Countersink 90°

15 0382 – Similar to DIN 335-C. All countersinks have 3 cutting edges, radially relieved.

For chatter-free countersinking and deburring. Ø 6 and 8 as solid carbide version, from Ø 10 solid carbide head with brazed shank.

15 0386 – Very **sturdy version**, multi-flute, **special geometry for very heavy duty use**. For **chatter-free countersinking and deburring**.

For difficult to machine materials.

Solid carbide head with brazed shank.

Suitable even for Hardox 500.



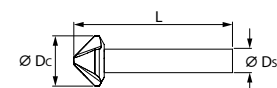
15 0386



15 0382

Note:

15 0386 – Ensure stable conditions during operation!



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	HARDOX® 500 < 1600 N	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
15 0382		75	50	65	60	30	18	8	8	8	8	8	6	16	10	16	25	5					
15 0386						30	18	8	8	8	8	8	6			6							

External Ø D _c	15 0386	15 0382	Number of cutting edges Z		smallest countersink Ø for holes from		L	Ø D _s	for countersinking to DIN 74 AF	for countersinking to DIN 74 BF	INOX < 60 HRC f	INOX < 900 N f
mm	90°	90°	15 0386	15 0382	15 0386	15 0382	mm	mm		15 0382	15 0386 mm/rev.	15 0382 mm/rev.
6	—	eShop	—	3	—	2	40	5	M3	—	—	0.1
8	—	eShop	—	3	—	2	45	6	M4	—	—	0.1
10	—	eShop	—	3	—	2.5	46	8	M5	—	—	0.12
10,4	eShop	eShop	4	3	4	2.5	46	8	—	M5	0.04	0.12
11,5	—	eShop	—	3	—	2.8	56	8	M6	—	—	0.14
12,4	eShop	eShop	5	3	4	2.8	56	8	—	M6	0.05	0.14
15	—	eShop	—	3	—	3.2	60	10	M8	—	—	0.14
16,5	eShop	eShop	5	3	4.5	3.2	60	10	—	M8	0.05	0.14
20,5	eShop	eShop	5	3	5	3.5	63	10	—	M10	0.06	0.16
25	eShop	eShop	5	3	5.5	3.8	67	10	—	M12	0.08	0.2
31	eShop	eShop	5	3	6	4.2	71	12	—	M16	0.1	0.24



Garant High-precision countersink 90° with unequal spacing

All countersinks have 3 cutting edges. Special geometry with extremely unequal spacing and matching cutting edge preparation. Radially relief ground. Flutes ground from solid.

Newly developed **special TiAlN coating** for long service life.

High-precision countersink, produced with tight manufacturing tolerances similar to DIN 335-C.

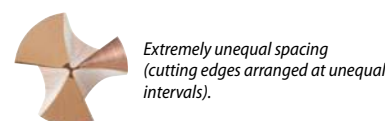
Advantage: Very smooth cutting throughout the entire countersinking operation.

Chatter-free running for perfect results and **optimum tool service life**.

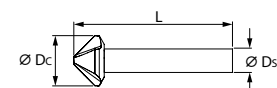
Application: High-precision countersinks for production of exactly round 90° countersunk surfaces. Very well suited to virtually all materials. Advantage in comparison to HSS countersinks especially in the field of high-tensile steels and because the working life is several times longer. **Shank tolerance h6** - suitable for mounting in hydraulic chucks or shrink-fit chucks.



15 0388



Extremely unequal spacing
(cutting edges arranged at unequal
intervals).



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	Alu cast < 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
15 0388	80	80	60	65	60	50	40	10	12	12	12	25	20	15	35	70	70	70					

External Ø D _c	15 0388	smallest countersink Ø for holes from	L	Ø D _s	for countersunk screws DIN 7991	INOX < 1100 N f
mm	TiAlN	mm	mm	mm		mm/rev.
6,3	eShop	1.5	45	5	M3	0.08
8,3	eShop	2	50	6	M4	0.1
10,4	eShop	2.5	50	6	M5	0.1
12,4	eShop	2.8	56	8	M6	0.12
16,5	eShop	3.2	60	10	M8	0.16
20,5	eShop	3.5	63	10	M10	0.2
25	eShop	3.8	67	10	M12	0.24
31	eShop	4.2	71	12	M16	0.24



Countersink 90°

Countersinks radially relief ground. Chip flutes are ground from solid up to size 31.

Chip angle varies with the countersink Ø for optimum chip formation.

Countersink point and circumference are relief ground and cut easily.

15 0390 – High-precision countersink, produced with tight manufacturing tolerances similar to DIN 335-D.

15 0395 – Economy countersink version.

15 0396 – High-precision countersink for considerable performance improvement.

Note: For countersink bits with shank 6.3 mm (1/4 inch) see Group 67.



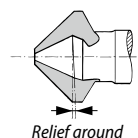
15 0390



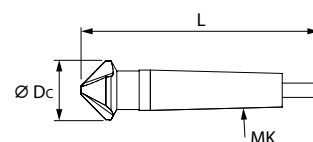
15 0395



15 0396



Relief ground



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N				
15 0390/0395	70	33		28	27	27																	
15 0396			25	34	32	32											80						

External Ø D _c	15 0390 Garant	15 0395 HOLEX	15 0396 Garant	smallest countersink Ø for holes from	L	MT	for countersunk screws ISO 2009, 2010, 7046, 7047	for countersunk screws DIN 7991	 < 500 N f
mm	High-precision countersink	Countersink 90°	High-precision countersink TiN	mm	mm				mm/rev.
16,5	eShop	eShop	–	3.2	85	1	–	M8	0.14
19	eShop	–	–	3.5	100	2	M10	–	0.14
20,5	eShop	eShop	–	3.5	100	2	–	M10	0.16
23	eShop	–	–	3.8	106	2	M12	–	0.16
25	eShop	eShop	eShop	3.8	106	2	–	M12	0.2
26	eShop	–	–	4	106	2	M14	–	0.2
28	eShop	–	–	4	112	2	–	M14	0.2
30	eShop	eShop	–	4.2	112	2	M16	–	0.2
31	eShop	eShop	eShop	4.2	112	2	–	M16	0.25
34	eShop	eShop	–	4.5	118	2	M18	M18	0.25
37	eShop	eShop	eShop	4.8	118	2	M20	M20	0.25
40	eShop	eShop	eShop	10	140	3	–	–	0.25
50	eShop	eShop	eShop	14	150	3	–	–	0.25
63	eShop	eShop	eShop	16	180	4	–	–	0.35
80	eShop	eShop	–	22	190	4	–	–	0.35
100	eShop	eShop	–	28	200	4	–	–	0.35



Garant Hand deburrer/countersink 90°

Three-flute countersink with ergonomic plastic handle. Handy power grip made of particularly tough and impact-resistant polypropylene. Due to its special surface structure, the **grip is non-slip even with oily or wet hands**.

Note: For clean deburring and chamfering of holes. Especially useful for assembly work. For other hand deburrers, see Group 83.



15 0400

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	S	K	N						
15 0400	●	●	●	●	●	○								○	○	○	●	●					●

External Ø	mm	12,4	16,5	20,5	25
15 0400	Hand deburrer 90°	eShop	eShop	eShop	eShop
smallest countersink Ø for holes from	mm	2.8	3.2	3.5	3.8
Overall length	mm	134	138	141	145
Length of handle	mm	100	105	110	110

Hand deburrer set 90°

15 0405	Hand deburrer set 90°	eShop
Supplied with:	No. 150400 size 12.4; 16.5; 20.5; 25.	
1 each hand deburrer		



15 0405

Garant Handle for countersink with 3 drive flats

To accept GARANT high-precision countersinks with unequal spacing and **3 drive flats** on the shank. One handle can accept various different sizes of countersink, all with the same shank diameter. Handy power grip made of particularly tough and impact-resistant polypropylene. Due to its special surface structure, the **grip is non-slip even with oily or wet hands**.



15 0409

Shank Ø	mm	6	8	10
15 0409	Handle for countersink with 3 drive flats	eShop	eShop	eShop
Length of handle	mm	106	112	120



Garant Countersink 75°

The chip flutes are ground from solid. Countersink point and circumference are relief ground and cut easily. This results in easy and **chatter-free cutting** for deep countersinking, as well as for deburring or countersinking.



15 0425

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX	INOX	Ti	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
15 0425	33	28	27	27															●			○	

External Ø D _c	15 0425	smallest countersink Ø for holes from	L	Ø D _s	f
mm	Countersink 75°	mm	mm	mm	mm/rev.
8	eShop	2	50	6	0.09
10,4	eShop	2.5	51	6	0.12
12,5	eShop	2.8	54	8	0.12
16,5	eShop	3.5	61	10	0.14
20	eShop	3.5	63	10	0.16
25	eShop	3.8	71	10	0.2



Garant Countersink 60°

15 0817 – Three **drive flats on the shank** for use in a 3-jaw chuck.

15 0815/0817 – **High-precision 60° countersink with unequal spacing.** **Special geometry with extremely unequal spacing** and matching cutting edge preparation. Radially relief ground. Flutes ground from solid. Newly developed **special TiAlN coating** for long service life.

15 0820/0840 – The chip flutes are ground from solid. Countersink point and circumference are relief ground and cut easily. This results in easy and **chatter-free cutting** for deep countersinking, as well as for deburring or countersinking.

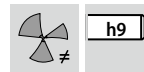
Advantage:

15 0815/0817 – Very smooth cutting throughout the entire countersinking operation. Chatter-free running for perfect results and **optimum tool service life**.

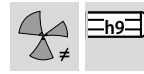
Application:

15 0815/0817 – High-precision countersinks for production of **exactly round 60° countersunk surfaces**.

15 0820/0840 – For chatter-free countersinking and deburring. **Especially suitable for chamfering tapped holes and for countersinking in jig and tool making.**



15 0815



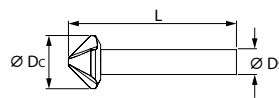
15 0817



15 0820



15 0840

15 0815
15 0817

Extremely unequal spacing (cutting edges arranged at unequal intervals)

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si									INOX 	INOX 	Ti 	GG(G) 	CuZn 	Graphite GRP CRP 	Uni 						
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N							
15 0815/0817	75	75	50	65	50	30	18	8	8			16	10	12	25	60	○	●		●		○		
15 0820	70	33		28	27	27														●		○		
15 0840	85	40	25	34	32	32						9						●		●		○		

External Ø D _c	 15 0815	 15 0817	 15 0820	 15 0840	smallest countersink Ø for holes from	L	Ø D _s	 f	
	High-precision countersink with unequal spacing	High-precision countersink with unequal spacing with 3 drive flats	Countersink Form C					15 0815 15 0817	15 0820 15 0840
	60°							mm/rev.	mm/rev.
mm	TiAlN	TiAlN		TiN	mm	mm	mm		
6,3	eShop	eShop	eShop	eShop	1.6	45	5	0.1	0.09
8	eShop	eShop	eShop	eShop	2	50	6	0.1	0.09
10	eShop	eShop	eShop	eShop	2.5	50	6	0.13	0.12
12,5	eShop	eShop	eShop	eShop	3.2	56	8	0.13	0.12
16	eShop	eShop	eShop	eShop	4	63	10	0.18	0.14
20	eShop	eShop	eShop	eShop	5	67	10	0.22	0.16
25	eShop	eShop	eShop	eShop	6.3	71	10	0.25	0.2



Garant Countersink 60° for stainless and acid-resistant steel

Very sturdy design, special geometry for heavy-duty use, with **chatter-free countersinking and deburring**.

Tool material: Size 8 – of solid carbide.
Size. 10 – 25 – solid carbide head with brazed shank. Design similar to DIN 344-C.



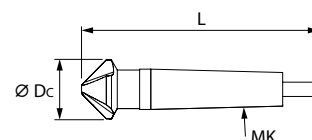
15 0855

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
15 0855				65	60	30	18	8	8					16	10	16	25		●	●	●	○	○

External Ø D _c	15 0855	smallest countersink Ø for holes from	L	Ø D _s	f
	Countersink solid carbide				
	60°				
mm		mm	mm	mm	mm/rev.
8	eShop	2	50	6	0.1
10	eShop	2.5	50	8	0.12
12,5	eShop	3.2	56	8	0.14
16	eShop	4	63	10	0.14
20	eShop	5	67	10	0.16
25	eShop	6.3	71	10	0.2



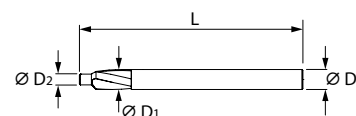
Application: For chatter-free countersinking and deburring.
Especially suitable for chamfering tapped holes and for countersinking in jig and tool making.



Ø D _c	11M 15 0860 Countersink, form D 60°	smallest countersink Ø for holes from	L	MT	 f
mm		mm	mm		mm/rev.
16	eShop	4	90	1	0.14
25	eShop	6.3	112	2	0.2
31,5	eShop	10	118	2	0.2
40	eShop	12.5	150	3	0.25
50	eShop	16	160	3	0.25
63	eShop	20	190	4	0.35
80	eShop	25	200	4	0.35



Note: Size 4.6×2.4 is not defined in DIN.



Counterbore Ø D ₁ × pin Ø ₂		11mm 15 5600	11mm 15 5700	for screw size	L	Ø D _s	 < 500 N f
mm		Mini counterbore for through holes 90°	Mini counterbore for through holes 180°		mm	mm	mm/rev.
2×1,1	eShop	—	—	M1	45	2	0.07
2,2×1,1	—	eShop	—	M1	45	2.2	0.07
2,5×1,3	eShop	—	eShop	M1.2	45	2.5	0.07
2,8×1,5	eShop	—	eShop	M1.4	45	2.8	0.07
3,3×1,7	eShop	—	eShop	M1.6	56	3.3	0.07
4,3×2,2	eShop	—	eShop	M2	56	4.3	0.07
4,6×2,4	eShop	—	eShop	M2.2	56	4.6	0.07
5×2,7	eShop	—	eShop	M2.5	56	5	0.07
6×3,2	eShop	—	—	M3	71	6	0.09
8×4,3	eShop	—	—	M4	71	8	0.09
10×5,3	eShop	—	—	M5	80	10	0.12
11.5×6.4	eShop	—	—	M6	80	11.5	0.12

HSS



Garant DIN counterbore with pilot for through holes

Spiral fluted counterbore. The pilot $\varnothing$ matches the intended purpose:

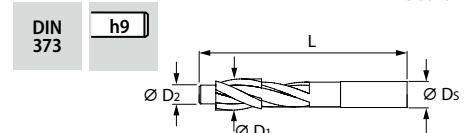
f – for through holes **fine** quality to DIN ISO 273.

m for through holes **medium** quality to DIN ISO 273.

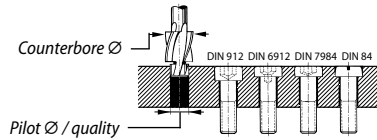
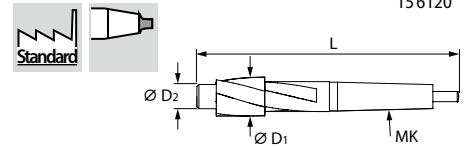
Application: For counterboring socket head screws DIN 912, 6912, 7984, and cheese head screws ISO 1207 (DIN 84).



15 6020



15 6120



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	> 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	N						
15 6020/6120	33			28	27																		

Counterbore Ø D ₁ ×pin Ø D ₂	11M	15 6020	11M	15 6120	for screw size	for quality of the hole	L		Ø D _s	MT	
	DIN counterbore for through holes						15 6020 mm	15 6120 mm	15 6020 mm	15 6120	f
mm											mm/rev.
6,5×3,2		eShop		–	M3	f	71	–	5	–	0.09
6,5×3,4		eShop		–	M3	m	71	–	5	–	0.09
6,5×3,9		(eShop)		–	M3.5	m	71	–	5	–	0.09
8×4,3		eShop		–	M4	f	71	–	5	–	0.09
8×4,5		eShop		–	M4	m	71	–	5	–	0.09
10×5,3		eShop		–	M5	f	80	–	8	–	0.12
10×5,5		eShop		–	M5	m	80	–	8	–	0.12
11×6,4		eShop		–	M6	f	80	–	8	–	0.12
11×6,6		eShop		–	M6	m	80	–	8	–	0.12
15×8,4		eShop		–	M8	f	100	–	12.5	–	0.12
15×9		eShop		–	M8	m	100	–	12.5	–	0.12
18×10,5		eShop		eShop	M10	f	100	150	12.5	2	0.14
18×11		eShop		eShop	M10	m	100	150	12.5	2	0.14
20×13		eShop		eShop	M12	f	100	150	12.5	2	0.16
20×13,5		eShop		eShop	M12	m	100	150	12.5	2	0.16
24×15		–		eShop	M14	f	–	162	–	2	0.16
24×15,5		–		eShop	M14	m	–	162	–	2	0.16
26×17		–		eShop	M16	f	–	192	–	3	0.2
26×17,5		–		eShop	M16	m	–	192	–	3	0.2

HSS



DIN 373

h9

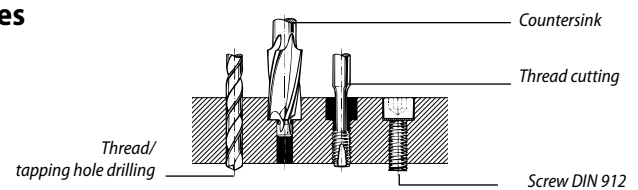
Garant DIN counterbore with pilot for tapping drill holes

Three edged, spiral fluted counterbore with fixed pilot for tapping drill holes.

Application: For counterboring socket head screws DIN 912, 6912, 7984 and slotted cheese head screws ISO 1207 (DIN 84). The pilot diameter matches the tapping hole diameter.



15 6220



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	> 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
15 6220	33			28	27	27																	

Counterbore $\varnothing D_1$ $\times$ pin $\varnothing D_2$	15 6220	for screw size	L	$\varnothing D_s$	
mm	mm		mm	mm	mm/rev.
6,5x2,5	eShop	M3	71	5	0.09
6,5x2,9	eShop	M3.5	71	5	0.09
8x3,3	eShop	M4	71	5	0.09
10x4,2	eShop	M5	80	8	0.12
11x5	eShop	M6	80	8	0.12
15x6,8	eShop	M8	100	12.5	0.12
18x8,5	eShop	M10	100	12.5	0.14
20x10,2	eShop	M12	100	12.5	0.16

Garant Counterbore sets in a case

15 6420 – Set of the most commonly used counterbores **for screws M3 – M4 – M5 – M6 – M8 – M10**.

Size DF – Counterbore 156020 **DF** = through hole **fine** quality

Size DM – Counterbore 156020 **DM** = through hole **medium** quality

Size K – Counterbore 156220 **K** = tapping hole

Type		DF	DM	K
15 6420	Counterbore set, 6 pieces, in a case	eShop	eShop	eShop
Content: Counterbore Ø×pilot Ø		1× each size 6.5×3.2; 8×4.3; 10×5.3; 11×6.4; 15×8.4; 18×10.5	1× each size 6.5×3.4; 8×4.5; 10×5.5; 11×6.6; 15×9; 18×11	1× each size 6.5×2.5; 8×3.3; 10×4.2; 11×5; 15×6.8; 18×8.5
15 6450	Empty case for 6 counterbores		eShop	



15 6420

Garant DIN counterbore for interchangeable pilots



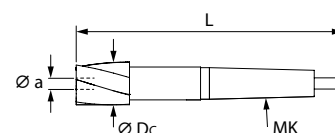
Multi-edged, spiral fluted counterbore with recess in face for fitting various pilots. Pilot is clamped with a screw in the counterbore.

Application: One counterbore can be used for **several** pilot holes of different diameters due to the interchangeable pilots.

Note: The dimensions relate to screws DIN 912, 6912, 7984 and ISO 1207. However, with an appropriate pilot, a counterbore can be used for other screw sizes or counterbore / pilot diameter combinations.



15 6520



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
15 6520	33			28	27	27																	

Countersink Ø D _c	15 6520	for screw size	Hole Ø a	L	MT	
mm	Counterbore without pilot		mm	mm		mm/rev.
15	eShop	M8	4	132	2	0.12
18	eShop	M10	5	140	2	0.14
20	eShop	M12	5	140	2	0.16
24	eShop	M14	6	150	2	0.16
26	eShop	M16	8	180	3	0.2
30	eShop	M18	8	180	3	0.2
33	eShop	M20	10	190	3	0.2
36	eShop	M22	10	190	3	0.2
40	eShop	M24	10	190	3	0.25

Pilot pin

DIN
1868



15 6620

Ø a×Ø d	15 6620	for screw size	for hole	suitable for counterbore Ø	Ø a×Ø d	15 6620	for screw size	for hole	suitable for counterbore Ø
mm	Pilot for counterbore			mm	mm	Pilot for counterbore			mm
4×6,8	eShop	M8	Core hole	15	8×17	eShop	M16	Through hole fine	26; 30
5×6,8	eShop	–	–	18; 20	8×17,5	eShop	M16	Through hole medium	26; 30
5×8,4	(eShop)	–	–	18; 20	8×19	eShop	M18	Through hole fine	26; 30
5×8,5	eShop	M10	Core hole	18; 20	10×14	eShop	–	–	33; 36; 40
5×9	eShop	–	–	18; 20	10×17,5	eShop	M20	Core hole	33; 36; 40
5×10,2	eShop	M12	Core hole	18; 20	10×21	eShop	M20	Through hole fine	33; 36; 40
5×11	eShop	M10	Through hole medium	18; 20	10×22	eShop	M20	Through hole medium	33; 36; 40
5×13	eShop	M12	Through hole fine	18; 20	10×26	eShop	M24	Through hole medium	33; 36; 40
6×8,5	eShop	–	–	24					
6×12	eShop	M14	Core hole	24					
8×10,2	(eShop)	–	–	26; 30					
8×12	eShop	–	–	26; 30					
8×14	eShop	M16	core hole	26; 30					

Modular counterboring system with internal coolant supply

[illegible]

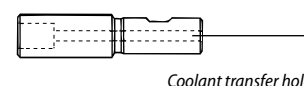
Modular counterboring system holder

Just 4 holder sizes cover a range from 5 mm to 66 mm (up to 85 mm available on request). Counterbores and solid pilots can be **combined as required** within **one size**, the solid pilot can be changed without removing the counterbore. Hardened and ground. Counterbore and pilot are clamped by one screw each, the counterbore is additionally protected against turning by means of a pin.

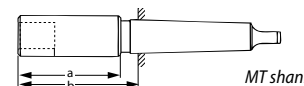
Size 1/20; 2/25 – Plain Weldon shank to DIN 1835 B, with internal coolant supply.

Application: For DIN counterbores, as well as with appropriate pilot / counterbore combinations for stepped holes on non-standard counterbores.

For stepped through holes pilots are available ex works in 2 lengths so that these holes can be produced without a separate pilot hole drilling operation.



Size / shank size	16C	15 6720	Counterbore range	Bore Ø H7	Hole length	External Ø	Length a	Length b
	Modular counterboring system holder							
01/10		eShop	5 – 9	7	12	14	45	–
0/10		eShop	8 – 16.5	10	18	18	42	–
0MK1		eShop	8 – 16.5	10	18	18	42	49.5
1/12		eShop	14 – 27.5	14	20	24	55	–
1/20		eShop	14 – 27.5	14	20	24	55	–
1MK2		eShop	14 – 27.5	14	20	24	55	61
2/25		eShop	24 – 66	22	28	34.5	75	–
2MK2		eShop	24 – 66	22	28	34.5	75	81
2MK3		eShop	24 – 66	22	28	34.5	75	81



Modular counterboring system



Very good machining and ideal chip evacuation due to spiral flutes. **Easy to regrind.** Counterbore is protected against turning in the holder.

Application: For counterboring screw heads to DIN or **by means of an appropriate combination of counterbore and pilot to produce stepped holes or non-standard counterbores.**

Note: Counterbores available on request also in HSS with optional TIN coating and brazed-on carbide tips with form "T" ISO inserts.



Size / counterbore Ø	16C 15 6730	Z	Cutter length	Shank Ø	Size / counterbore Ø	16C 15 6730	Z	Cutter length	Shank Ø	Size / counterbore Ø	16C 15 6730	Z	Cutter length	Shank Ø
	Modular counterbore					Modular counterbore					Modular counterbore			
mm			mm	mm	mm			mm	mm	mm			mm	mm
01/5	eShop	2	8	7	1/15,5	eShop	3	22	14	2/28	eShop	4	24	22
01/5,5	eShop	2	8	7	1/16	eShop	3	22	14	2/29	eShop	4	24	22
01/6	eShop	2	8	7	1/16,5	eShop	3	22	14	2/30	eShop	4	24	22
01/6,5	eShop	2	8	7	1/17	eShop	3	22	14	2/31	eShop	4	24	22
01/7	eShop	2	8	7	1/17,5	eShop	3	22	14	2/32	eShop	4	24	22
01/8	eShop	2	8	7	1/18	eShop	3	22	14	2/33	eShop	4	24	22
0/8	eShop	3	14	10	1/18,5	eShop	3	22	14	2/34	eShop	4	24	22
0/8,5	eShop	3	14	10	1/19	eShop	3	22	14	2/35	eShop	4	24	22
0/9	eShop	3	14	10	1/19,5	eShop	3	22	14	2/36	eShop	4	24	22
0/9,5	eShop	3	14	10	1/20	eShop	3	22	14	2/38	eShop	4	24	22
0/10	eShop	3	14	10	1/20,5	eShop	3	22	14	2/39	(eShop)	4	24	22
0/10,5	eShop	3	14	10	1/21	eShop	3	22	14	2/40	eShop	4	24	22
0/11	eShop	3	14	10	1/21,5	(eShop)	3	22	14	2/42	eShop	4	24	22
0/11,5	eShop	3	14	10	1/22	eShop	3	22	14	2/43	(eShop)	4	24	22
0/12	eShop	3	14	10	1/22,5	eShop	3	22	14	2/44	(eShop)	4	24	22
0/12,5	eShop	3	14	10	1/23	eShop	3	22	14	2/45	eShop	4	24	22
0/13	eShop	3	14	10	1/24	eShop	3	22	14	2/46	eShop	4	24	22
0/13,5	eShop	3	14	10	1/24,5	eShop	3	22	14	2/48	(eShop)	4	24	22
0/14	eShop	3	14	10	1/25	eShop	3	22	14	2/50	eShop	4	24	22
0/14,5	eShop	3	14	10	1/25,5	(eShop)	3	22	14	2/52	(eShop)	4	24	22
0/15	eShop	3	14	10	1/26	eShop	3	22	14	2/55	(eShop)	4	24	22
0/15,5	eShop	3	14	10	1/27	eShop	3	22	14	2/56	(eShop)	4	24	22
0/16	eShop	3	14	10	1/27,5	eShop	3	22	14	2/58	(eShop)	4	24	22
0/16,5	eShop	3	14	10	2/24	eShop	4	24	22	2/60	(eShop)	4	24	22
1/14	eShop	3	22	14	2/25	eShop	4	24	22	2/66	(eShop)	4	24	22
1/14,5	eShop	3	22	14	2/26	eShop	4	24	22					
1/15	eShop	3	22	14	2/27	eShop	4	24	22					

Pilot pin

Fixed guide pin: gas nitrided, precision turned

Rotating pin: surface hardened and ground.

Size 01/2.4 to 1/8.4 – **fixed pilot.**

Size 1/8.5 to 1/18 – **rotating pilot with coolant bore.**

Size 2/11.5 to 2/13 – **fixed pilot.**

Size 2/14 to 2/32 – **rotating pilot with coolant bore.**

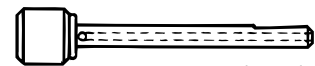
Application: When using the rotating pilot (with coolant bore) size 1 and 2 in holder No. 156720 size 1/20 the coolant is fed directly to the cutting edges for optimum chip evacuation.



Fixed pilot



Rotating pilot



Coolant outlet

Size / pin Ø	16C	15 6750	overall length	Shank Ø	Size / pin Ø	16C	15 6750	overall length	Shank Ø	Size / pin Ø	16C	15 6750	overall length	Shank Ø
		Pilot	mm	mm			Pilot	mm	mm			Pilot	mm	mm
01/2,4		(eShop)	41	2.4	0/9		eShop	59	4	1/15		eShop	79	6
01/3		(eShop)	41	2.4	0/9,5		eShop	59	4	1/16		eShop	79	6
01/3,3		(eShop)	41	2.4	0/10		eShop	59	4	1/17		eShop	79	6
01/3,5		(eShop)	41	2.4	0/10,5		eShop	59	4	1/18		eShop	79	6
01/4		eShop	41	2.4	0/11		(eShop)	59	4	2/11,5		eShop	105	10
01/4,5		(eShop)	41	2.4	1/6,6		eShop	79	6	2/12		eShop	105	10
0/4		eShop	59	4	1/6,7		eShop	79	6	2/13		eShop	105	10
0/4,2		eShop	59	4	1/7		eShop	79	6	2/14		eShop	105	10
0/4,5		eShop	59	4	1/7,5		(eShop)	79	6	2/14,5		(eShop)	105	10
0/4,9		eShop	59	4	1/7,9		(eShop)	79	6	2/15		eShop	105	10
0/5		eShop	59	4	1/8		eShop	79	6	2/16		eShop	105	10
0/5,3		eShop	59	4	1/8,4		eShop	79	6	2/17		eShop	105	10
0/5,5		eShop	59	4	1/8,5		eShop	79	6	2/17,5		eShop	105	10
0/5,8		eShop	59	4	1/9		eShop	79	6	2/18		eShop	105	10
0/6		eShop	59	4	1/9,5		eShop	79	6	2/19		(eShop)	105	10
0/6,4		eShop	59	4	1/9,9		eShop	79	6	2/20		eShop	105	10
0/6,5		eShop	59	4	1/10		eShop	79	6	2/21		eShop	105	10
0/6,6		eShop	59	4	1/10,5		eShop	79	6	2/22		eShop	105	10
0/6,7		eShop	59	4	1/11		eShop	79	6	2/24		(eShop)	105	10
0/6,9		eShop	59	4	1/11,5		eShop	79	6	2/25		(eShop)	105	10
0/7		eShop	59	4	1/12		eShop	79	6	2/26		eShop	105	10
0/7,5		eShop	59	4	1/12,5		eShop	79	6	2/28		(eShop)	105	10
0/7,9		eShop	59	4	1/13		eShop	79	6	2/30		eShop	105	10
0/8		eShop	59	4	1/13,5		eShop	79	6	2/32		(eShop)	105	10
0/8,4		eShop	59	4	1/14		eShop	79	6					
0/8,5		eShop	59	4	1/14,5		eShop	79	6					

HSS



a f s

Modular counterboring sets in wooden stand

Set of holders, counterbores, and pilots for machining the most common bore Ø.

Application: For DIN counterbores, as well as appropriate pilot / counterbore combinations for stepped holes or non-standard counterbores.

Note: Modular counterboring sets also available in HSS with optional TIN coating and brazed-on carbide tips with form "T" ISO inserts.



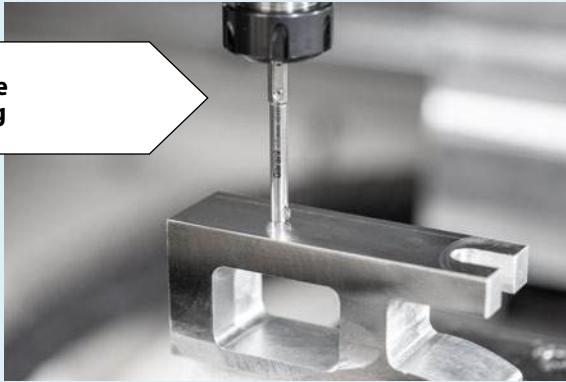
156700

Size / shank size	01/10	0/10	OMK1	1/12	1MK2	2MK2	2MK3
16C 15 6700 Modular counterboring set in a wooden stand	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)
Number of cutting edges Z	2	2	2	3	3	3; 4	3; 4
Counterbore range mm	5 – 9	8.5 – 16.5	8.5 – 16.5	14.5 – 24.5	14.5 – 24.5	26 – 36	26 – 36
Content:							
1× each counterbore No. 156730	5; 5.5; 6; 6.5; 7; 8; 9	8.5; 9.5; 10.5; 11.5; 13.5; 16.5	8.5; 9.5; 10.5; 11.5; 13.5; 16.5	14.5; 16.5; 18.5; 20.5; 22.5; 24.5	14.5; 16.5; 18.5; 20.5; 22.5; 24.5	26; 28; 30; 32; 33; 34; 36	26; 28; 30; 32; 33; 34; 36
1× each pilot No. 156750	2.4; 2.5; 2.7; 3; 3.3; 3.5; 4; 4.5	4; 4.5; 5; 5.5; 6; 6.5; 7; 7.5; 8; 8.5; 9; 9.5; 10; 10.5	4; 4.5; 5; 5.5; 6; 6.5; 7; 7.5; 8; 8.5; 9; 9.5; 10; 10.5	7; 7.5; 8; 8.5; 9; 9.5; 10; 10.5; 11; 11.5; 12; 13; 14; 15	7; 7.5; 8; 8.5; 9; 9.5; 10; 10.5; 11; 11.5; 12; 13; 14; 15	12; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22; 23; 24; 25	12; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22; 23; 24; 25
1× each holder No. 156720 with shank	Ø 10 mm	Ø 10 mm	MT1	Ø 12 mm	MT2	MT2	MT3

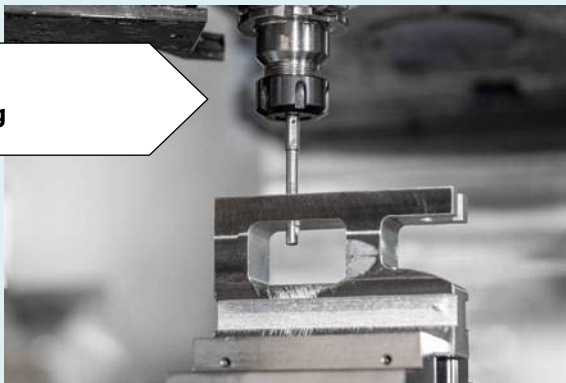
Garant Universal deburring tool

The efficient solution for forward and reverse deburring of holes with a machine.

Front-side
deburring



Rear-side
deburring



Technical performance:

- Effective and reliable deburring.
- Front and rear machining in a single operation.
- No rotation of the workpiece required.
- Sustainable product concept for series production.
- High process stability and repetition accuracy.
- Special blade geometry protects the bore wall.

Flexible use:

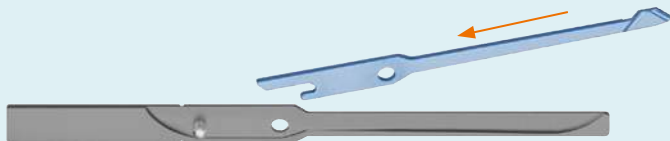
- Only **two blade sizes** for a standard diameter range from 3 mm to 20 mm and an extended special diameter range from 20.5 mm to 25 mm.
- Deburring of varying bore diameters with spring-mounted blades.
- Deburring of aligned holes in a single operation.

Easy to use and low-maintenance version:

- Spring mechanism for convenient insertion and removal of the blade.
- One screw size for all toolholders.
- No separate tension spring.

Installing the blade

1. Insert the blade into the slot provided until it reaches the stop pin.



2. Push the blade down into the guide pocket.

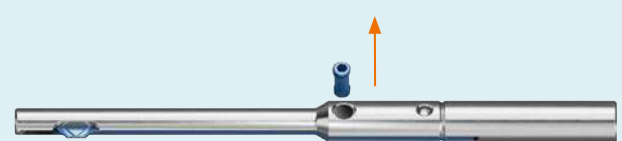


3. Lock the blade by turning the fastening screw clockwise.

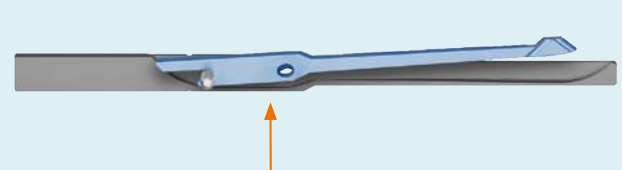


Removing the blade

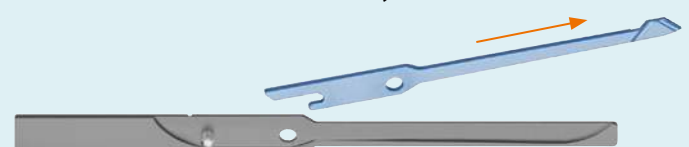
1. Release the blade by turning the fastening screw anti-clockwise.



2. Press the blade out of the base body through the hole.



3. Pull the blade out of the base body.



15

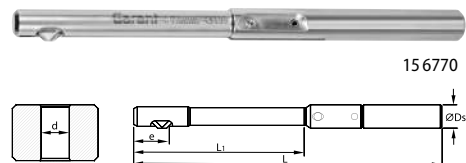
Garant Universal deburring tool for holes

Universal deburring tool base body for hole diameters of 3 - 20 mm

For **front and rear deburring** of holes in **one operation**. **Easy handling** on all machines and **quick changing** of the deburring blades. The deburring tool consists of a **base body**, **deburring blade** and **fastening screw**.

Application: Suitable for **table, box column or pillar drilling machines, conventional milling machines and CNC machining centres**. Ensure stable clamping conditions. **Not suitable for hand-held machines**.

Note: **Blade not included.** Please order matching blade No. 156775 separately. Fastening screw included. Spare fastening screw can be found under No. 156780.



for hole Ø d	15A 15 6770	e	L ₁	L	Ø D _s	suitable blade size	f
mm	Universal deburring tool base body	mm	mm	mm	mm		mm/rev.
3	eShop	10	29	85	8	3	0.05
3,5	eShop	10	29	85	8	3	0.05
4	eShop	10	29	85	8	3	0.07
4,5	eShop	10	29	85	8	3	0.07
5	eShop	12	53	115	8	5	0.08
5,5	eShop	12	53	115	8	5	0.08
6	eShop	12	53	115	8	5	0.09
6,5	eShop	12	53	115	8	5	0.09
7	eShop	12	53	115	8	5	0.09
7,5	eShop	12	53	115	8	5	0.09
8	eShop	12	53	115	10	5	0.09
8,5	eShop	12	53	115	10	5	0.1
9	eShop	12	53	115	10	5	0.1
9,5	eShop	12	53	115	10	5	0.1
10	eShop	12	80	125	10	5	0.1
10,5	eShop	12	80	125	10	5	0.1
11	eShop	12	80	125	10	5	0.1
11,5	eShop	12	80	125	12	5	0.1

for hole Ø d	15A 15 6770	e	L ₁	L	Ø D _s	suitable blade size	f
mm	Universal deburring tool base body	mm	mm	mm	mm		mm/rev.
12	eShop	12	80	125	12	5	0.1
12,5	eShop	12	80	125	12	5	0.1
13	eShop	12	80	125	12	5	0.1
13,5	eShop	12	80	125	12	5	0.1
14	eShop	12	80	125	12	5	0.1
14,5	eShop	12	80	125	12	5	0.1
15	eShop	12	80	125	12	5	0.1
15,5	eShop	12	80	125	12	5	0.1
16	eShop	12	80	125	16	5	0.1
16,5	eShop	12	80	125	16	5	0.1
17	eShop	12	80	125	16	5	0.1
17,5	eShop	12	80	125	16	5	0.1
18	eShop	12	80	125	16	5	0.1
18,5	eShop	12	80	125	16	5	0.1
19	eShop	12	80	125	16	5	0.1
19,5	eShop	12	80	125	20	5	0.1
20	eShop	12	80	125	20	5	0.1

Blade for GARANT universal deburring tool

HSS



Blade for base body No. 156770.

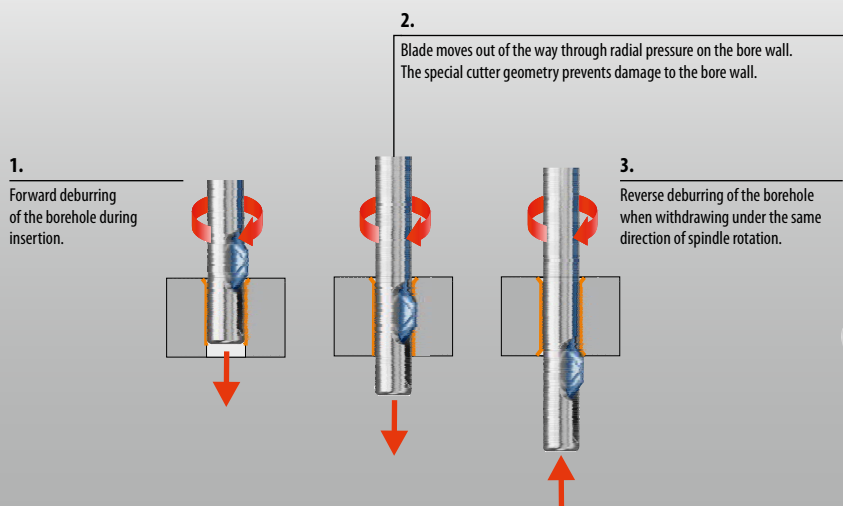
156775

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	Alu cast > 10 % Si 											INOX 	INOX 	Ti 	GG(G) 	Uni 						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K							
156775	50	50	50	40	35	30	25	25	20	15				20	15	10	25	●	●			○		

Size	3	5
15A 15 6775	Blade HSS for universal deburring tool	
For base bodies	3 – 4,5	5 – 20

Application notes:

Universal use in the deburring process, efficient and reliable.

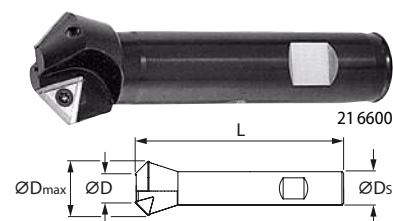


Blade with spring mechanism

KOMET Countersinks 45° KWS for TOH.0902.. / 1403..

Application: For **deburring** round and long holes and for milling trapezoidal slots.
For countersinking to DIN fine for DIN screws M10 – M20.
Rigid mounting is required (not suitable for power drills).

Note: For suitable triangular indexable inserts see 216700; 216740; 216770.

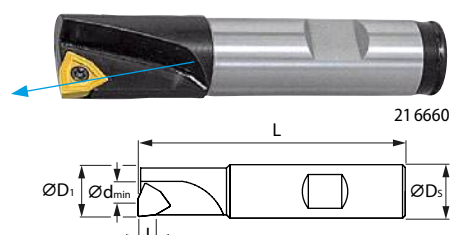


for DIN countersunk screws	2HD	21 6600	Ø D	Number of cutting edges Z	Number of indexable inserts	Ø D _{max}	L _{tot}	Ø D _s h6	suitable indexable insert	Indexable insert No. 216700; No. 216740; No. 216770	Set of insert screws
		KOMET® countersink 45°									
		Weldon shank	mm			mm	mm	mm			
M10		eShop	7	2	2	19	100	16	TO.. 0902	14-6603	239653 8IP7 (1.3 Nm)
M12		eShop	11	2	2	23	100	16	TO.. 0902	14-6603	239653 8IP7 (1.3 Nm)
M14		eShop	11	1	2	26	100	16	TO.. 0902	14-660	239653 8IP7 (1.3 Nm)
M16		eShop	12	2	2	30	100	20	TO.. 1403	26-660	239653 10IP (2.8 Nm)
M18		eShop	16	2	2	34	100	20	TO.. 1403	26-660	239653 10IP (2.8 Nm)
M20		eShop	19	2	2	37	100	20	TO.. 1403	26-660	239653 10IP (2.8 Nm)



KOMET Indexable countersinking mill KWZ
for WOEX 0302../05T3../06T3../0804..

Application: For producing counterbores for cylinder head screws to DIN 74 sheet 2, from M8 with through coolant feed.



Type	240 21 6660 KOMET® countersinking mill Weldon shank	for DIN cylinder head screws	Number of cutting edges Z	Number of indexable inserts	Ø D ₁ H13	Ø d _{min}	maximum counter- bore depth l	L _{tot}	Ø D ₃ h6	Indexable insert No. 216780 – 216910; No. 216950	Set of insert screws
M5N	eShop	M5	1	1	10	5.3	10	80	16	10-010 / 110	239652 6IP1 (1.0 Nm)
M6N	eShop	M6	1	1	11	6.4	10	80	16	10-010 / 110	239652 6IP1 (1.0 Nm)
M8	eShop	M8	1	1	15	8.4	14	80	16	24-010 / 110	239652 8IP2 (1.3 Nm)
M10	eShop	M10	1	1	18	10.4	16	80	16	24-010 / 110	239652 8IP2 (1.3 Nm)
M12	eShop	M12	1	1	20	13	20	100	25	24-010 / 110	239652 8IP2 (1.3 Nm)
M14	eShop	M14	2	2	24	15	19	100	25	24-010 / 110	239652 8IP2 (1.3 Nm)
M16	eShop	M16	2	2	26	17	21	100	25	24-010 / 110	239652 8IP2 (1.3 Nm)
M18	eShop	M18	2	2	30	19	23	100	25	34-010 / 110	239652 10IP1 (2.8 Nm)
M20	eShop	M20	2	2	33	21	25	100	25	42-010 / 110	239653 15IP3 (6.3 Nm)

KOMET Unisix® carbide indexable inserts WOEX.. Type W28 / W29

Suitable for: Indexable countersinking mill No. 216660.

Note:

21 6811 Size 17-010 – For indexable countersinks M5, M6 series up to March 2010.

Suitable for/ v _c [m/min]																			GG(G)	Graphite GRP CRP					
	Alu plastics	Alu cast	Alu cast > 10% Si										INOX	INOX	Ti										
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N							
21 6780																									
21 6811	300	300	200	200	200	200	140	120						120	100	30	160	160			●		○		
21 6850				200	200	200	140	120						120	100	30					●		○		
21 6910				200	200	200								120	100	30					●		○		
21 6950	350	200	200															150			●		○		



Cutter geometry:

- Cutting edge chamfered and honed
- Precision sintered, with double chip breaker



Designation type W28			10-010	10-110	17-010	24-010	24-110	34-010	34-110	42-010	42-110	
24T	21 6811	KOMET Unisix® indexable insert	BK6440	—	eShop	—	—	—	—	—	—	10
24T	21 6780		BK62	eShop	—	—	eShop	—	—	—	—	10
24T	21 6850		BK8425	eShop	—	—	eShop	—	eShop	—	—	10
24T	21 6910		BK7935	eShop	—	—	eShop	—	—	eShop	—	10
24T	21 6950		BK7710	—	eShop	—	—	eShop	—	eShop	—	eShop
ISO code indexable insert			WOEX 030204	WOEX 030204	WOEX 040204	WOEX 05T304	WOEX 05T304	WOEX 06T304	WOEX 06T304	WOEX 080404	WOEX 080404	



Garant

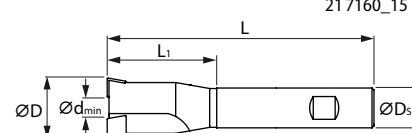
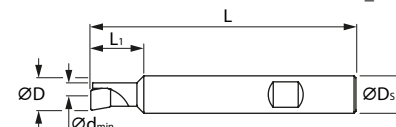
Forwards countersinking mill 180° for CCMT 060204 / 09T304 DIN 974-1 series 1 (for DIN hexagon socket screws)

Standard: DIN 974-1 series 1 (for DIN cylinder-head bolts).

Note: The recommended indexable inserts have a corner radius of 0.4 mm. If indexable inserts with a different larger corner radius are used, the dimension $\varnothing d_{\min}$ (see table) will not be achieved!

Size 10–24 – Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

Size 25–42 – Use GARANT torque screwdriver TQ No. **211750 size 3.0** with bit No. **674252 size 15IP**.



Countersink $\varnothing D$	210	21 7160	for DIN cylinder head screws	Number of cutting edges Z	$\varnothing d_{\min}$	L_1	L_{tot}	$\varnothing D_s$ h6	suitable indexable insert	Insert screw
mm		Forwards countersinking mill 180° Weldon shank			mm	mm	mm	mm		
10		eShop	M5	1	4	15	85	12	260142	219795 1 (8IP; 1.2 Nm)
11		eShop	M6	1	4	15	85	12	260142	219795 1 (8IP; 1.2 Nm)
15		eShop	M8	2	5	30	92	12	260142	219795 1 (8IP; 1.2 Nm)
16		eShop	–	2	5	30	92	12	260142	219795 1 (8IP; 1.2 Nm)
17		eShop	–	2	6	32	94	16	260142	219795 1 (8IP; 1.2 Nm)
17,5		eShop	–	2	6.5	40	96	16	260142	219795 1 (8IP; 1.2 Nm)
18		eShop	M10	2	7	41	97	16	260142	219795 1 (8IP; 1.2 Nm)
19		eShop	–	2	8	41	100	16	260142	219795 1 (8IP; 1.2 Nm)
20		eShop	M12	2	9	41	102	16	260142	219795 1 (8IP; 1.2 Nm)
21		eShop	–	2	10	41	105	16	260142	219795 1 (8IP; 1.2 Nm)
22		eShop	–	2	11	41	110	16	260142	219795 1 (8IP; 1.2 Nm)
23		eShop	–	2	12	41	112	16	260142	219795 1 (8IP; 1.2 Nm)
24		eShop	M14	2	13	41	115	16	260142	219795 1 (8IP; 1.2 Nm)
25		eShop	–	2	8	40	120	16	260150	219844 (15IP; 3.0 Nm)
26		eShop	M16	2	9	55	125	20	260150	219844 (15IP; 3.0 Nm)
27		eShop	–	2	10	55	128	20	260150	219844 (15IP; 3.0 Nm)
28		eShop	–	2	11	55	130	20	260150	219844 (15IP; 3.0 Nm)
29		eShop	–	2	12	55	132	20	260150	219844 (15IP; 3.0 Nm)
30		eShop	M18	2	13	55	134	20	260150	219844 (15IP; 3.0 Nm)
31		eShop	–	2	14	55	136	20	260150	219844 (15IP; 3.0 Nm)
32		eShop	–	2	15	55	138	20	260150	219844 (15IP; 3.0 Nm)
33		eShop	M20	2	16	55	140	20	260150	219844 (15IP; 3.0 Nm)
34		eShop	–	2	16	60	140	25	260150	219844 (15IP; 3.0 Nm)
35		eShop	–	2	17	60	140	25	260150	219844 (15IP; 3.0 Nm)
36		eShop	–	2	18	60	140	25	260150	219844 (15IP; 3.0 Nm)
37		eShop	–	2	19	60	140	25	260150	219844 (15IP; 3.0 Nm)
38		eShop	–	2	20	60	140	25	260150	219844 (15IP; 3.0 Nm)
39		eShop	–	2	21	60	140	25	260150	219844 (15IP; 3.0 Nm)
40		eShop	M24	2	22	60	140	25	260150	219844 (15IP; 3.0 Nm)
41		eShop	–	2	23	60	140	25	260150	219844 (15IP; 3.0 Nm)
42		eShop	–	2	24	60	140	25	260150	219844 (15IP; 3.0 Nm)



Garant Reverse countersinking mill 180° for CPMT 05T1.. / CCMT 0602.. / 09T3.. / 1204..

With just one cutter (z = 1).

Size 15; 18 – Without internal cooling.

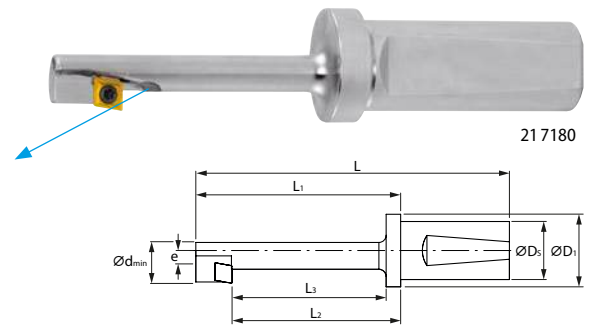
Note: Dimension e = programming dimension (information on the end face).

Size 15 – Use GARANT torque screwdriver TQ No. **211750 size 0.9** with bit No. **674248 size TX7**.

Size 18–30 – Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

Size 33–48 – Use GARANT torque screwdriver TQ No. **211750 size 3.0** with bit No. **674252 size 15IP**.

Size 53–76 – Use GARANT torque screwdriver TQ No. **211750 size 5.5** with bit No. **674252 size 20IP**.



maximum countersink Ø D	210 21 7180	Ø d _{min}	L ₁	L ₂	L ₃	Ø D ₁	e	L	Ø D ₅ h ₆	Shank type	suitable indexable insert	Insert screw	Set of insert screws
mm	180° reverse countersinking mill	mm	mm	mm	mm	mm	mm	mm	mm				
15	eShop	8.5	55	42	35	25	3.55	105	20	Whistle Notch	217185 UNI	219947 (TX7; 0.9 Nm)	–
18	eShop	10.5	62	47	40	25	4.05	112	20	Whistle Notch	260142	219795 1 (8IP; 1.2 Nm)	–
20	eShop	13	67	52	45	25	3.8	117	20	Whistle Notch	260142	219795 1 (8IP; 1.2 Nm)	–
24	eShop	15	72	57	50	25	4.8	122	20	Whistle Notch	260142	219795 1 (8IP; 1.2 Nm)	–
26	eShop	17	82	67	60	25	5.05	132	20	Whistle Notch	260142	219795 1 (8IP; 1.2 Nm)	–
30	eShop	19	92	77	65	25	6.05	142	20	Whistle Notch	260142	219795 1 (8IP; 1.2 Nm)	–
33	eShop	21	102	82	75	25	6.65	152	20	Whistle Notch	260150	219844 (15IP; 3.0 Nm)	–
36	eShop	23	113	93	85	40	7.05	173	32	Whistle Notch	260150	219844 (15IP; 3.0 Nm)	–
40	eShop	25	123	103	95	40	8.05	183	32	Whistle Notch	260150	219844 (15IP; 3.0 Nm)	–
43	eShop	30	123	103	95	40	7.05	183	32	Whistle Notch	260150	219844 (15IP; 3.0 Nm)	–
48	eShop	33	163	143	135	40	8.05	223	32	Whistle Notch	260150	219844 (15IP; 3.0 Nm)	–
53	eShop	36	140	–	110	–	9.05	210	40	Weldon	260158	–	219848 (20IP; 5.5 Nm)
57	eShop	39	150	–	120	–	9.55	220	40	Weldon	260158	–	219848 (20IP; 5.5 Nm)
66	eShop	45	165	–	135	–	11.05	245	50	Weldon	260158	–	219848 (20IP; 5.5 Nm)
76	eShop	52	185	–	155	–	12.55	265	50	Weldon	260158	–	219848 (20IP; 5.5 Nm)

Garant Insert for reverse countersinking mill No. 217180 size 15

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
217185	100	80	75	75	65	65	65	65	H	H	H	H	40	40	40	100	90	●	●	○			



Type	UNI			
21A 21 7185	CPMT 05T104 T	HB7035	eShop	10
f	mm/rev. 0.1			

Reverse countersinking mill No. 21 7180 in use – programming amount (e)

i

1. Position
the tool at the centre of the hole, spindle orientation 0°.

2. Offset
the tool by the programmed amount (e).

3. Plunge
to the position below the lower edge of the workpiece, plus safety clearance. Spindle not rotating!

4. Return
to the centre of the hole by amount (e), then start the spindle.

5. Countersink
to the desired depth.

6. Position
Pull back approx. -0.5 mm in the Z axis. Spindle orientation to 0°.

7. Offset
the tool by the programmed amount (e). Withdraw the milling cutter out through the component.

Garant

HOLEX

Reaming overview



Hand reamers							
Colour ring							
Brand	HOLEX	Garant	Garant	HOLEX	HOLEX	HOLEX	Garant
Tool material	HSS	HSS	HSS	HSS	HSS	HSS	HSS
Coating							
Standard / DIN	206 B	859	Man. std	Man. std	9	204	Man. std
Version		adjustable	adjustable	Taper 1:10	Taper 1:50	Morse taper	NPT 1:16
Item number	16 0150	16 0500	16 0600	16 1000	16 1200	16 2500	16 2650
Catalogue page	226	227	227	228	228	229	229
Size range Ø	mm	2 – 40	4 – 30	6.4 – 67	3 – 35	1.1 – 30.7	MT0 – MT4
Hole tolerance H7	●						
Ø dimension 1/100							
Configurability	16 0200						
conf. nominal Ø	mm	0.95 – 60.2					
ISO 513							
Aluminium	N	○	○	○	○	○	○
Steel < 500 N/mm ²	P	●	●	●	●	●	●
Steel < 900 N/mm ²	P	○	○	○	○	○	○
Steel < 1400 N/mm ²	P						
Steel > 45 HRC	H						
INOX	M						
Ti	S						
GG (G)	K						
CuZn	N						
Graphite, GRP, CRP	N						
UNI							

Machine reamers												
Colour ring												
Brand	HOLEX	HOLEX	HOLEX	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant
Tool material	HSS	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	Sol. carb./Carb.	Solid carbide	Solid carbide
Coating					TiN							TiAlN
Standard / DIN	311	2179	208 B	212 B	212 B	Man. std	Man. std	Man. std	Man. std	8093	Man. std	Man. std
Version	Rivet hole	Taper 1:50				extra long	extra long	Face	NC shank	Carbide-tipped		
Item number	16 2800	16 1600	16 4000	16 3000	16 3500	16 2961	16 2971	16 2826	16 2900	16 4500	16 4340	16 4341
Catalogue page	230	229	236	235	235	234	234	230	231 – 234	237	238 – 240	238 – 240
Size range Ø	mm	6.4 – 40	1.9 – 16	5 – 50	1.5 – 20	4 – 20	2 – 12	2 – 12	3 – 12	1 – 20	1 – 16	0.6 – 20
Hole tolerance H7			●	●	●	●	●	●	●	●	●	●
Ø dimension 1/100										16 2902	●	●
Configurability			16 4180							16 2951	16 4345	16 4344
conf. nominal Ø	mm		2.81 – 50							0.95 – 20	0.95 – 20.2	0.95 – 20.2
ISO 513												
Aluminium	N	●	●	●	●	●	●	●	●	○	●	●
Steel < 500 N/mm ²	P	●	●	●	●	●	●	●	●	○	●	●
Steel < 900 N/mm ²	P	○	○	●	○	○	○	○	○	●	●	●
Steel < 1400 N/mm ²	P			○	○	○	○	○	○	●	●	●
Steel > 45 HRC	H											
INOX	M			○	○		●	●	●	○	○	●
Ti	S			○	○	○	○	○	○		●	○
GG (G)	K			○	○	○	○	○	○		●	●
CuZn	N			○	○	○	○	○	○	●	●	●
Graphite, GRP, CRP	N											
UNI			●	●		●	●	●	●		●	●

● = highly suitable; ○ = suitable only under restricted conditions
The areas of application are starting points for pre-selection.

HPC reamers				
Colour ring				
				
Brand	Garant	Garant	Garant	Garant
Tool material	HSS	Solid carbide	Solid carbide	Solid carbide
Coating	TiAlN	DLC	TiAlN	TiAlN
Standard / DIN	Man. std	Man. std	Man. std	Man. std
Through hole	16 4358	16 4400	16 4310	16 4420
Blind hole	16 4359	16 4405	16 4315	16 4425
Catalogue page	241	244	245	246
Size range Ø	6 – 40	4 – 20	4 – 20	4 – 20
Through-coolant supply	IC	IC	IC	IC
Hole tolerance H7	●	●	●	●
Ø dimension 1/100				
Configurability	●	●	●	●
conf. nominal Ø	6 – 40.2	3.7 – 20.2	3.7 – 20.2	3.7 – 20.2
ISO 513				
Aluminium, plastics	N	●		
Steel < 500 N/mm ²	P	●		●
Steel < 900 N/mm ²	P	●		●
Steel < 1400 N/mm ²	P	●		●
Steel > 45 HRC	H			●
INOX	M			●
Ti	S		●	
GG (G)	K	●		●
CuZn	N	○		○
Graphite, GRP, CRP	N			
UNI		●		●

TopCut REAM interchangeable head reamers

Colour ring		
		
Brand	Garant	Garant
Tool material	Solid carbide	Cermet
Coating	TiAlN	
Standard / DIN	Man. std	Man. std
Through hole	23 9720	23 9710
Blind hole		23 9715
Catalogue page	247	247
Size range Ø	10 – 26*	10 – 50*
Through-coolant supply	IC	IC
Hole tolerance H7	●	●
ISO 513 *Blind holes from Ø 15 mm		
Aluminium	N	
Steel < 500 N/mm ²	P	●
Steel < 900 N/mm ²	P	●
Steel < 1400 N/mm ²	P	○
Steel > 45 HRC	H	
INOX	M	
Ti	S	
GG (G)	K	○
CuZn	N	
Graphite, GRP, CRP	N	
UNI		

Garant TOPCUT REAM

Modular reaming for precise and sustainable process design.

- Finish ground for fit IT7.
- System concentricity ≤ 5 µm (when mounted).
- Solid carbide and cermet heads.



23 9710



23 9715



23 9720

● = highly suitable; ○ = suitable only under restricted conditions
The areas of application are starting points for pre-selection.



HOLEX Hand reamers

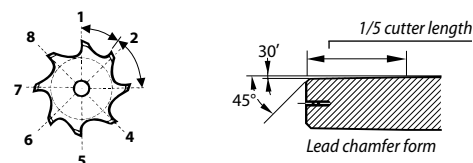
With **left-hand helix** 7 – 8° and long taper lead, more than 1/5 of the cutting length. An even number of teeth with irregular spacing for accurately round holes, free of chatter. The cylindrical ground chamfer on the plain cutting section smooths the hole and guides the reamer.

Application: For through holes (not for blind holes). Also very suitable for interrupted holes.

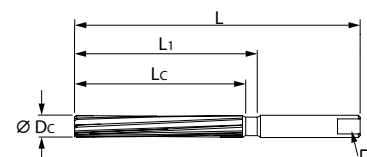
Note: Hand reamers **finish ground to match your specifications** can be ordered as **No. 160200**.
For suitable tap wrenches see No. 148350; 148200; 148410 and extensions No.149400.



160150



Even number of teeth with uneven spacing – pairs of teeth are exactly opposite each other; e.g. teeth 1 and 5.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
160150																							

Nominal Ø D _c	120 16 0150	L _c	L ₁	L	Number of cutting edges Z	□	Nominal Ø D _c	120 16 0150	L _c	L ₁	L	Number of cutting edges Z	□
mm	Hand reamer H7	mm	mm	mm		mm	mm	Hand reamer H7	mm	mm	mm		mm
2	eShop	25	33	50	4	1.6	13	eShop	76	96	152	8	10
2,5	eShop	29	37	58	4	2	14	eShop	81	101	163	8	11.2
3	eShop	31	40	62	6	2.24	15	eShop	81	101	163	8	11.2
3,5	eShop	35	45	71	6	2.8	16	eShop	87	107	175	8	12.5
4	eShop	38	48	76	6	3.15	17	eShop	87	107	175	8	12.5
4,5	eShop	41	51	81	6	3.55	18	eShop	93	113	188	8	14
5	eShop	44	54	87	6	4	19	eShop	93	113	188	8	14
5,5	eShop	47	57	93	6	4.5	20	eShop	100	120	201	8	16
6	eShop	47	57	93	6	4.5	22	eShop	107	132	215	8	18
6,5	eShop	50	60	100	6	5	24	eShop	115	140	231	8	20
7	eShop	54	68	107	6	5.6	25	eShop	115	140	231	8	20
8	eShop	58	72	115	6	6.3	26	eShop	115	140	231	8	20
8,5	eShop	58	72	115	6	6.3	28	eShop	124	150	247	10	22.4
9	eShop	62	77	124	6	7.1	30	eShop	124	150	247	10	22.4
10	eShop	66	86	133	6	8	32	eShop	133	165	265	10	25
11	eShop	71	91	142	6	9	35	eShop	142	175	284	10	28
12	eShop	76	96	152	6	10	40	eShop	152	190	305	10	31.5



HOLEX Hand reamer set

With **left-hand helix** 7 – 8° and long taper lead, more than 1/5 of the cutting length. An even number of teeth with irregular spacing for accurately round holes, free of chatter. The cylindrical ground land on the plain cutting section smooths the hole and guides the reamer.

Application: For through holes (not for blind holes). Also very suitable for interrupted holes.

Supplied with: 6-piece hand reamer set in a box.



160175

Number of reamers	6
120 160175	Hand reamer set No. 160150 in a box H7
Content: 1 pc. each hand reamer	eShop Size 3; 4; 5; 6; 8; 10



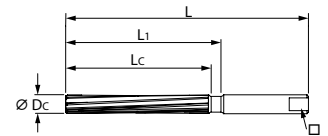
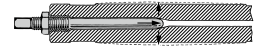
Garant Re-adjustable hand reamers

Up to 5 mm with straight flutes; from 6 mm with **left hand helix** 7 – 8°. The reamer body is slit and can be adjusted by approx. 1/100 of the reamer $\varnothing$ using the expansion screw (e.g. 20 mm $\varnothing = 0.2$ mm).

Application: For opening through holes to a slight oversize. Use the straight fluted reamers only in holes which are not interrupted. Make sure that the screw is not left tightened when stored.



160500



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
16 0500																						

Nominal $\varnothing$ D_c	16 0500	L_c	L_1	L	$\square$	Nominal $\varnothing$ D_c	16 0500	L_c	L_1	L	$\square$	Nominal $\varnothing$ D_c	16 0500	L_c	L_1	L	$\square$
mm	Re-adjustable hand reamer	mm	mm	mm	mm	mm	Re-adjustable hand reamer	mm	mm	mm	mm	mm	Re-adjustable hand reamer	mm	mm	mm	mm
4	eShop	24	48	76	3.15	11	(eShop)	51	86	142	9	19	(eShop)	68	112	188	14
5	eShop	30	54	87	4	12	eShop	56	91	152	10	20	eShop	75	119	201	16
6	eShop	33	59	93	4.5	14	eShop	61	97	163	11.2	22	eShop	82	129	215	18
7	(eShop)	38	66	107	5.6	15	eShop	61	97	163	11.2	24	(eShop)	85	137	231	20
8	eShop	42	70	115	6.3	16	eShop	67	105	175	12.5	25	(eShop)	85	137	231	20
9	(eShop)	46	75	124	7.1	17	(eShop)	67	105	175	12.5	28	(eShop)	94	149	247	22.4
10	eShop	50	80	133	8	18	(eShop)	68	112	188	14	30	eShop	94	149	247	22.4

Garant Adjustable hand reamers

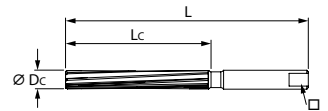
16 0600 – Large adjustment range. Fine adjustment using ring gauges or micrometers. Tools with taper lead; the flutes are relieved and cylindrically ground.

Suitable for:

16 0700/0750 – Hand reamer No. 160600



160600



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
16 0600																						

$\varnothing D_c$	16 0600	16 0700	16 0750	Adjustment range $\varnothing$	L_c	L	$\square$
mm	Adjustable hand reamer	Spare blade set	Spare nut	16 0600 mm	16 0600 mm	16 0600 mm	16 0600 mm
6,4	eShop	(eShop)	(eShop)	6.4 – 7.2	32	110	3
7,2	eShop	(eShop)	(eShop)	7.2 – 8	32	110	3.4
8	eShop	(eShop)	(eShop)	8 – 9	34	115	3.8
9	eShop	(eShop)	(eShop)	9 – 10	34	115	4.3
10	eShop	(eShop)	(eShop)	10 – 11	34	115	4.9
11	eShop	(eShop)	(eShop)	11 – 12	35	125	4.9
12	eShop	(eShop)	(eShop)	12 – 13.5	41	135	6.2
13,5	eShop	(eShop)	(eShop)	13.5 – 15.5	50	146	7
15,5	eShop	(eShop)	eShop	15.5 – 18	60	166	8
18	eShop	(eShop)	eShop	18 – 21	65	178	9
21	eShop	(eShop)	eShop	21 – 24	76	195	11
24	eShop	(eShop)	(eShop)	24 – 27.5	82	218	12
27,5	eShop	(eShop)	(eShop)	27.5 – 31.5	86	245	14.5
31,5	eShop	(eShop)	(eShop)	31.5 – 37	98	280	18
37	eShop	(eShop)	(eShop)	37 – 45	108	325	20
45	eShop	(eShop)	(eShop)	45 – 55	118	370	26
55	eShop	(eShop)	(eShop)	55 – 67	125	400	32



Garant Adjustable hand reamer sets in a wooden box

Assortment of hand reamers No. 160600.

Number of reamers	11	13
16 0800 Adjustable hand reamer set, in a wooden box	eShop	eShop
$\varnothing$ range	mm 8 – 31.5	8 – 45



160800



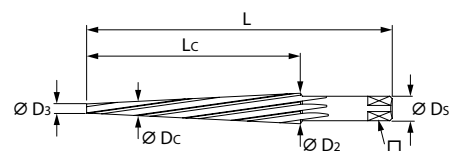
HOLEX Taper reamers

Straight fluted hand reamer with conically increasing cutting edges (1 mm over 10 mm length).

Application: For reaming conical or uninterrupted holes prepared in steps. Not for parallel holes.



16 1000



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
16 1000		●		●	●	○												●			○	

small × large Ø	120 16 1000	Ø D ₃	Ø D ₂	L _c	L	□	small × large Ø	120 16 1000	Ø D ₃	Ø D ₂	L _c	L	□
	Taper reamer 1:10							Taper reamer 1:10					
mm		mm	mm	mm	mm	mm	mm		mm	mm	mm	mm	mm
3×10	eShop	3	10	70	100	6.3	10×25	eShop	10	25	150	195	16
5×15	eShop	5	15	100	140	10	15×35	(eShop)	15	35	200	250	22.4



HOLEX Taper pin hand reamers

Conically increasing cutting edges (1 mm over 50 mm length).

Size 1.2 – 2.5 – **straight flutes. Form A.**

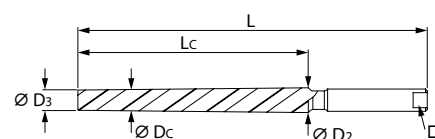
Size 3 – 25 – **helical flutes. Form B.**

Application: For reaming tapered holes by hand for taper pins to ISO 2339 (DIN 1), DIN 258, 1447, ISO 8736, 8737 (DIN 7977, 7978).

Recommendation: The pre-drilled hole is best produced using a straight shank taper pin drill No. 116310.



16 1200



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
16 1200		●		●	●	○												○			○	

Nominal Ø D _c	120 16 1200	Ø D ₃	Ø D ₂	L _c	L	□	Nominal Ø D _c	120 16 1200	Ø D ₃	Ø D ₂	L _c	L	□
	Taper pin hand reamer 1:50							Taper pin hand reamer 1:50					
mm		mm	mm	mm	mm	mm	mm		mm	mm	mm	mm	mm
1,2	eShop	1.1	1.74	32	50	2.5	8	eShop	7.9	10.8	145	180	8
1,5	eShop	1.4	2.14	37	57	2.5	10	eShop	9.9	13.4	175	215	10
2	eShop	1.9	2.86	48	68	2.5	12	eShop	11.8	16	210	255	11.2
2,5	eShop	2.4	3.36	48	68	2.5	14	eShop	13.8	18	210	255	12.5
3	eShop	2.9	4.06	58	80	3.15	16	eShop	15.8	20.4	230	280	14
4	eShop	3.9	5.26	68	93	4	20	eShop	19.8	24.8	250	310	18
5	eShop	4.9	6.36	73	100	5	25	(eShop)	24.7	30.7	300	370	22.4
6	eShop	5.9	8	105	135	6.3							

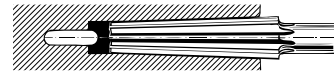
HSS

DIN
204**HOLEX** Morse taper hand reamers

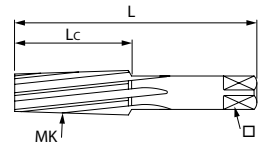
Straight flutes, with plain shank and square drive.

Application: For reaming Morse taper sockets from taper holes or stepped holes.

16 2500



Reaming a Morse taper with the Morse taper reamer No. 16 2500



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10% Si												INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
16 2500		●		●	●	○														●				○

MT	120	16 2500	L _c	L	□	MT	120	16 2500	L _c	L	□
		Morse taper reamer						Morse taper reamer			
			mm	mm	mm				mm	mm	mm
MK0		eShop	61	93	6.2	MK3		eShop	96	146	16
MK1		eShop	66	102	8	MK4		eShop	119	179	20
MK2		eShop	79	121	11						

HSS

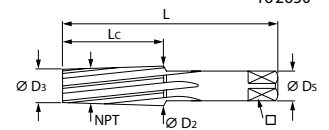
**Garant** NPT hand reamers

For preparing conical NPT threads.

Spiral version, with plain shank and square drive.



16 2650



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
16 2650		●		●	●	○													●				○

NPT	110	16 2650	Ø D ₃	Ø D ₂	L _c	L	□	Ø D _s	NPT	110	16 2650	Ø D ₃	Ø D ₂	L _c	L	□	Ø D _s
		NPT reamer 1:16	mm	mm	mm	mm	mm	mm			NPT reamer 1:16	mm	mm	mm	mm	mm	mm
1/16		eShop	5.95	7	17	70	4.9	6	1/2		eShop	16.95	19.1	35	95	12	16
1/8		eShop	8.05	9.1	17	70	5.5	7	3/4		eShop	22.25	24.5	35	105	16	20
1/4		eShop	10.3	12	27	80	9	11	1		eShop	28	30.7	43	130	20	25
3/8		eShop	13.75	15.4	27	85	9	12									

HSS
EDIN
2179**HOLEX** Machine taper pin reamers

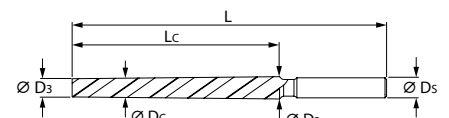
With 45° left hand helix, evacuates swarf in cutting direction.

Application: On machines for tapered through holes. The peeling twist requires removal of a thick chip (pre-drilled hole must not be too large).

For taper pins to ISO 2339, 8736, 8737 (DIN 1, 7977, 7978), DIN 258 and 1447.

Recommendation: The pre-drilled hole is best produced using a straight shank taper pin drill No. 116310.

16 1600



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
16 1600																								
Nominal $\varnothing D_c$	120	16 1600	$\varnothing D_3$	$\varnothing D_2$	L_c	L	$\varnothing D_s$	f																
		Machine taper pin reamer	mm	mm	mm	mm	mm	mm/rev.																
2		eShop	1.9	2.86	48	86	3.15	0.1																
2.5		eShop	2.4	3.36	48	86	3.15	0.1																
3		eShop	2.9	4.06	58	100	4	0.1																
4		eShop	3.9	5.26	68	112	5	0.1																
5		eShop	4.9	6.36	73	122	6.3	0.1																
Nominal $\varnothing D_c$	120	16 1600	$\varnothing D_3$	$\varnothing D_2$	L_c	L	$\varnothing D_s$	f																
		Machine taper pin reamer	mm	mm	mm	mm	mm	mm/rev.																
6		eShop	5.9	8	105	160	8	0.1																
8		eShop	7.9	10.8	145	207	10	0.13																
10		eShop	9.9	13.4	175	245	12.5	0.15																
12		eShop	11.8	16	210	290	16	0.15																



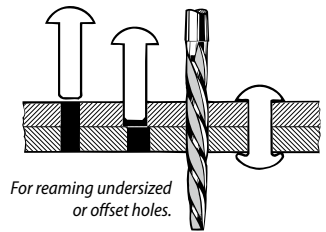
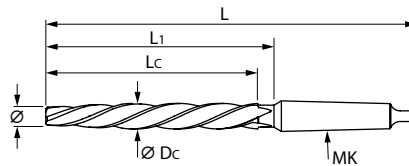
HOLEX Bridge reamers with Morse taper shank

Tapering flute form with a length of approx. 3×nominal Ø. Very sturdy due to strong core and radius heel of flutes. Easy, peeling cut by spiral flutes; number of flutes varies according to the size.

Application: Particularly useful for the installation of components; for reaming offset holes or enlarging rivet holes. Bridge reamers are used on pneumatic hand-held drills in boiler construction.



16 2800



For reaming undersized
or offset holes.

Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
16 2800		20	20		15	10	7																

Nominal Ø D _c k11	120 16 2800	Minor Ø	L _c	L ₁	L	Number of cutting edges Z	MT	
	Bridge reamer							f
mm		mm	mm	mm	mm			mm/rev.
6,4	(eShop)	4.5	75	85.5	151	3	1	0.12
7,4	(eShop)	5.2	80	90.5	156	3	1	0.12
8,4	(eShop)	5.9	85	95.5	161	3	1	0.12
9,5	(eShop)	6.8	90	100.5	166	4	1	0.15
10	(eShop)	7	95	105.5	171	4	1	0.15
11	(eShop)	7.7	100	110.5	176	4	1	0.15
12	(eShop)	8.1	105	119	199	4	2	0.15
13	(eShop)	9.1	105	119	199	4	2	0.15
14	(eShop)	9.8	115	129	209	4	2	0.15
15	(eShop)	10.5	125	139	219	4	2	0.2
16	(eShop)	11.2	135	149	229	4	2	0.2
17	(eShop)	11.9	135	152	251	4	3	0.2
18	(eShop)	12.2	145	162	261	4	3	0.2
19	(eShop)	13.2	145	162	261	4	3	0.2
20	(eShop)	13.8	155	172	271	4	3	0.25

Nominal Ø D _c k11	120 16 2800	Minor Ø	L _c	L ₁	L	Number of cutting edges Z	MT	
	Bridge reamer							f
mm		mm	mm	mm	mm			mm/rev.
21	(eShop)	14.8	155	172	271	4	3	0.25
22	(eShop)	15.4	165	182	281	4	3	0.25
23	(eShop)	16.4	165	182	281	4	3	0.25
24	(eShop)	16.8	180	197	296	4	3	0.25
25	(eShop)	17.8	180	197	296	4	3	0.25
26	(eShop)	18.8	180	197	296	4	3	0.25
27	(eShop)	19.2	195	212	311	4	3	0.25
28	(eShop)	20.2	195	212	311	4	3	0.25
30	(eShop)	22.2	195	212	311	5	3	0.3
31	(eShop)	22.6	210	227	326	5	3	0.3
32	(eShop)	23.6	210	230	354	5	4	0.3
33	(eShop)	24.6	210	230	354	5	4	0.3
34	(eShop)	25.2	220	240	364	5	4	0.3
37	(eShop)	28.2	220	240	364	5	4	0.35
40	(eShop)	30.8	230	250	374	5	4	0.35



Garant Machine face reamers

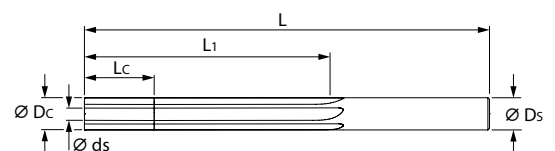
Chucking reamer cutting on the end face to achieve the most **accurate size possible**. The **optimised end face cutting** enables a **precise alignment fit** of the hole that is produced. Straight flute machine chucking reamers with **long flutes** for optimum chip evacuation.

Application: For production of sequential holes with alignments that exactly match. For the highest demands for straightness of holes. For reaming of through holes and right to the bottom of blind holes.

Note: Note the new shank tolerance h6. No. 162830 Configurable reamers are available in the diameter range from 2.200 to 12.220 mm and for any choice of fit.



16 2826



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	K	N						
16 2826		20	20		15	12	12	10	10							10	20						

Nominal Ø D _c	110 16 2826	d _s	L _c	L ₁	L	Number of cutting edges Z	Ø D _s		Reaming oversize in Ø reference value
	Face reamer							f	
mm	H7	mm	mm	mm	mm		mm	mm/rev.	mm
3	(eShop)	1.5	12	33	61	6	3	0.1	0.1
4	(eShop)	1.7	16	44	75	6	4	0.1	0.1
5	(eShop)	1.7	20	53	86	6	5	0.1	0.1
6	(eShop)	2	20	59	93	6	6	0.15	0.1 – 0.2
7	(eShop)	2.5	22	69	109	6	7	0.15	0.1 – 0.2

Nominal Ø D _c	110 16 2826	d _s	L _c	L ₁	L	Number of cutting edges Z	Ø D _s		Reaming oversize in Ø reference value
	Face reamer							f	
mm	H7	mm	mm	mm	mm		mm	mm/rev.	mm
8	(eShop)	3	24	71	117	6	8	0.15	0.1 – 0.2
9	(eShop)	3.5	24	77	125	6	9	0.2	0.1 – 0.2
10	(eShop)	4.5	26	84	133	6	10	0.2	0.1 – 0.2
11	(eShop)	4.5	26	89	142	6	11	0.2	0.1 – 0.2
12	(eShop)	4.5	26	96.5	151	6	12	0.2	0.1 – 0.2

H7

HSS
E

Garant NC machine reamers with whole-number shank Ø

Version suitable for NC similar to DIN 212 with straight shank Ø for standard chucking especially in hydraulic chucks or high precision collet chucks.

For highest concentricity and process reliability.

No need to order special collets.

With long flutes and left-hand helix.

≤ Ø size 1.7 with 3 teeth; ≥ Ø size 1.8 even number of teeth and irregular spacing.

≤ Ø size 3.7 both ends with centre points; ≥ Ø size 3.8 both ends with centre holes.

Reamer manufacturing or cutting edge tolerance to DIN1420 for H7 bore tolerance.

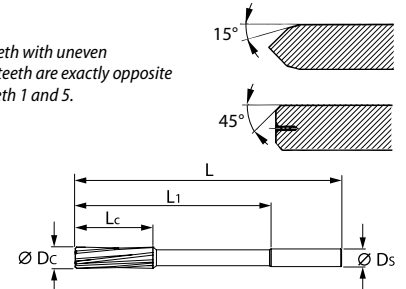
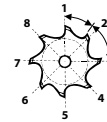
Note:

For reamers in 1/100 sizes see No. 162902.

For reamers with diameters and fits to specification see No. 162951



Even number of teeth with uneven spacing – pairs of teeth are exactly opposite each other; e.g. teeth 1 and 5.



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N						
16 2900	20	20	20	20	15	10	7	5	4				5	5	5	5	13						

Nominal Ø D _c mm or inch	110 16 2900	Inch Ø ±	L _c	L ₁	L	Number of cutting edges Z	Ø D _s	 < 750 N f	Reaming oversize in Ø reference value	Nominal Ø D _c mm or inch	110 16 2900	Inch Ø ±	L _c	L ₁	L	Number of cutting edges Z	Ø D _s	 < 750 N f	Reaming oversize in Ø reference value				
																				NC reamer	H7	NC reamer	H7
1	eShop	—	5.5	15	34	3	1	0.1	0.05 – 0.1	6.6	eShop	—	28	64	101	6	6	0.2	0.1 – 0.2				
1.1	eShop	—	6.5	14	36	3	1	0.1	0.05 – 0.1	6.7	eShop	—	28	64	101	6	6	0.2	0.1 – 0.2				
1.2	eShop	—	7.5	13	38	3	2	0.1	0.05 – 0.1	6.8	eShop	—	31	72	109	6	8	0.2	0.1 – 0.2				
1.3	eShop	—	7.5	13	38	3	2	0.1	0.05 – 0.1	6.9	eShop	—	31	72	109	6	8	0.2	0.1 – 0.2				
1.4	eShop	—	8	15	40	3	2	0.1	0.05 – 0.1	7	eShop	—	31	72	109	6	8	0.2	0.1 – 0.2				
1.5	eShop	—	8	18	40	3	2	0.1	0.05 – 0.1	7.1	eShop	—	31	72	109	6	8	0.2	0.1 – 0.2				
1/16	eShop	1.59	9	20	43	3	2	0.1	0.05 – 0.1	9/32	eShop	7.14	31	72	109	6	8	0.2	0.1 – 0.2				
1.6	eShop	—	9	20	43	3	2	0.1	0.05 – 0.1	7.2	eShop	—	31	72	109	6	8	0.2	0.1 – 0.2				
1.7	eShop	—	9	20	43	3	2	0.1	0.05 – 0.1	7.3	eShop	—	31	72	109	6	8	0.2	0.1 – 0.2				
1.8	eShop	—	10	22	46	4	2	0.15	0.05 – 0.1	7.4	eShop	—	31	72	109	6	8	0.2	0.1 – 0.2				
1.9	eShop	—	10	22	46	4	2	0.15	0.05 – 0.1	7.5	eShop	—	31	72	109	6	8	0.2	0.1 – 0.2				
2	eShop	—	11	24	49	4	2	0.15	0.05 – 0.1	7.6	eShop	—	33	80	117	6	8	0.2	0.1 – 0.2				
2.1	eShop	—	11	24	49	4	2	0.15	0.05 – 0.1	7.7	eShop	—	33	80	117	6	8	0.2	0.1 – 0.2				
2.2	eShop	—	12	25	53	4	3	0.15	0.05 – 0.1	7.8	eShop	—	33	80	117	6	8	0.2	0.1 – 0.2				
2.3	eShop	—	12	25	53	4	3	0.15	0.05 – 0.1	7.9	eShop	—	33	80	117	6	8	0.2	0.1 – 0.2				
3/32	eShop	2.38	14	29	57	4	3	0.15	0.05 – 0.1	5/16	eShop	7.94	33	80	117	6	8	0.25	0.1 – 0.2				
2.4	eShop	—	14	29	57	4	3	0.15	0.05 – 0.1	8	eShop	—	33	80	117	6	8	0.25	0.1 – 0.2				
2.5	eShop	—	14	29	57	4	3	0.15	0.05 – 0.1	8.1	eShop	—	33	80	117	6	8	0.25	0.1 – 0.2				
2.6	eShop	—	14	29	57	4	3	0.15	0.05 – 0.1	8.2	eShop	—	33	80	117	6	8	0.25	0.1 – 0.2				
2.7	eShop	—	15	33	61	6	3	0.2	0.05 – 0.1	8.3	eShop	—	33	80	117	6	8	0.25	0.1 – 0.2				
2.8	eShop	—	15	33	61	6	3	0.2	0.05 – 0.1	8.4	eShop	—	33	80	117	6	8	0.25	0.1 – 0.2				
2.9	eShop	—	15	33	61	6	3	0.2	0.05 – 0.1	8.5	eShop	—	33	80	117	6	8	0.25	0.1 – 0.2				
3	eShop	—	15	33	61	6	3	0.2	0.1	8.6	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
3.1	eShop	—	16	37	65	6	4	0.2	0.1	8.7	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
1/8	eShop	3.18	16	37	65	6	4	0.2	0.1	11/32	eShop	8.73	36	83	125	6	10	0.25	0.1 – 0.2				
3.2	eShop	—	16	37	65	6	4	0.2	0.1	8.8	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
3.3	eShop	—	16	37	65	6	4	0.2	0.1	8.9	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
3.4	eShop	—	18	42	70	6	4	0.2	0.1	9	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
3.5	eShop	—	18	42	70	6	4	0.2	0.1	9.1	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
3.6	eShop	—	18	42	70	6	4	0.2	0.1	9.2	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
3.7	eShop	—	18	42	70	6	4	0.2	0.1	9.3	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
3.8	eShop	—	19	46	75	6	4	0.15	0.1	9.4	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
3.9	eShop	—	19	46	75	6	4	0.15	0.1	9.5	eShop	—	36	83	125	6	10	0.25	0.1 – 0.2				
5/32	eShop	3.97	19	46	75	6	4	0.15	0.1	3/8	eShop	9.53	38	92	133	6	10	0.25	0.1 – 0.2				
4	eShop	—	19	46	75	6	4	0.15	0.1	9.6	eShop	—	38	92	133	6	10	0.25	0.1 – 0.2				
4.1	eShop	—	19	46	75	6	4	0.15	0.1	9.7	eShop	—	38	92	133	6	10	0.25	0.1 – 0.2				
4.2	eShop	—	19	46	75	6	4	0.15	0.1	9.8	eShop	—	38	92	133	6	10	0.25	0.1 – 0.2				
4.3	eShop	—	21	51	80	6	5	0.15	0.1	9.9	eShop	—	38	92	133	6	10	0.25	0.1 – 0.2				
4.4	eShop	—	21	51	80	6	5	0.15	0.1	10	eShop	—	38	92	133	6	10	0.25	0.1 – 0.2				
4.5	eShop	—	21	51	80	6	5	0.15	0.1	10.1	eShop	—	38	92	133	6	10	0.25	0.1 – 0.2				
4.6	eShop	—	21	51	80	6	5	0.15	0.1	10.2	eShop	—	38	92	133	6	10	0.25	0.1 – 0.2				
4.7	eShop	—	21	51	80	6	5	0.15	0.1	13/32	eShop	10.32	38	92	133	6	10	0.25	0.1 – 0.2				
3/16	eShop	4.76	23	57	86	6	5	0.15	0.1	10.5	eShop	—	38	92	133	6	10	0.25	0.1 – 0.2				
4.8	eShop	—	23	57	86	6	5	0.15	0.1	11	eShop	—	41	101	142	6	10	0.25	0.1 – 0.2				
4.9	eShop	—	23	57	86	6	5	0.15	0.1	7/16	eShop	11.113	41	101	142	6	10	0.25	0.1 – 0.2				
5	eShop	—	23	57	86	6	5	0.2	0.1	11.5	eShop	—	41	101	142	6	10	0.25	0.1 – 0.2				
5.1	eShop	—	23	57	86	6	5	0.2	0.1	12	eShop	—	44	110	151	6	10	0.25	0.1 – 0.2				
5.2	eShop	—	23	57	86	6	5	0.2	0.1	12.1	eShop	—	44	110	151	6	10	0.25	0.1 – 0.3				
5.3	eShop	—	23	57	86	6	5	0.2	0.1	12.2	eShop	—	44	110	151	6	10	0.25	0.1 – 0.3				
5.4	eShop	—	26	56	93	6	6	0.2	0.1	12.5	eShop	—	44	110	151	6	10	0.25	0.1 – 0.3				
5.5	eShop	—	26	56	93	6	6	0.2	0.1	1/2	eShop	12.7	44	110	151	6	10	0.25	0.1 – 0.3				
7/32	eShop	5.556	26	56	93	8	6	0.2	0.1 – 0.2	12.7	eShop	—	44	110	151	6	10	0.25	0.1 – 0.3				
5.6	eShop	—	26	56	93	6	6	0.2	0.1 – 0.2	13	eShop	—	44	110	151	6	10	0.25	0.1 – 0.3				
5.7	eShop	—	26	56	93	6	6	0.2	0.1 – 0.2	14	eShop	—	47	112	160	8	14	0.3	0.1 – 0.3				
5.8	eShop	—	26	56	93	6	6	0.2	0.1 – 0.2	9/16	eShop	14.29	50	112	160	8	14	0.3	0.1 – 0.3				
5.9	eShop	—	26	56	93	6	6	0.2	0.1 – 0.2	15	eShop	—	50	114	162	8	14	0.3	0.1 – 0.3				
6	eShop	—	26	56	93	6	6	0.2	0.1 – 0.2	5/8	eShop	15.88	52	123	170	8	14	0.3	0.1 – 0.3				
6.1	eShop	—	28	64	101	6	6	0.2	0.1 – 0.2	16	eShop	—	52	123	170	8	14	0.3	0.1 – 0.3				
6.2	eShop	—	28	64	101	6	6	0.2	0.1 – 0.2	17	eShop	—	54	128	175	8	14	0.3	0.1 – 0.3				
6.3	eShop	—	28	64	101	6	6	0.2	0.1 – 0.2	18	eShop	—	56	135	182	8	14	0.3	0.1 – 0.3				
1/4	eShop	6.35	28	64	101	6	6	0.2	0.1 – 0.2	19	eShop	—	58	139	189	8	16	0.3	0.1 – 0.3				
6.4	eShop	—	28	64	101	6	6	0.2	0.1 – 0.2	20	eShop	—	60	145	195	8	16	0.3	0.1 – 0.3				
6.5	eShop	—	28	64	101	6	6	0.2	0.1 – 0.2														



Garant NC machine reamer set with whole-number shank Ø

Version suitable for NC similar to DIN 212 with **straight shank Ø** for **standard chucking** especially in **hydraulic chucks** or **high precision collet chucks**. For **highest concentricity** and **process reliability**. **No need to order special collets**. With long flutes and left-hand helix.

Even number of teeth with irregular spacing.

Size 3 with centring tip, from size 4 with centre holes at both ends.

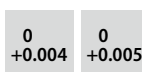
Reamer manufacturing tolerance to DIN 1420 for H7 hole tolerance field.

Supplied with: 6-piece NC reamer set in a box.

Number of reamers	6
110 16 2925 NC reamer set No. 162900 in a box H7	eShop
Content: 1 pc. each NC reamer	Size 3; 4; 5; 6; 8; 10



16 2925



Garant NC machine reamers, whole-number shank Ø in 1/100 sizes with defined tolerance

Version suitable for NC similar to DIN 212 with **straight shank Ø** for **standard chucking** especially in **hydraulic chucks** or **high precision collet chucks**. For **highest concentricity** and **process reliability**. **No need to order special collets**.

With long flutes and left-hand helix.

Rearers such as 162900, but in 1/100 sizes.

Tolerance specifications:

Size 1.01 – 5.5: Manufacturing or cutting edge tolerance **0 / +0.004 mm**.

Size 5.51 – 12.05: Manufacturing or cutting edge tolerance **0 / +0.005 mm**.

Ordering example:

Desired dia. 6.24 mm – ordering particulars: article number 162902 6.24.

The 6.24 mm reamer with tolerance 0 / +0.005 mm is supplied.

Depending on availability, delivery time is from stock or max. 1 working week.

To determine which diameter you need for your desired fit, please see the following table.

Often one reamer also covers further fits, since the tolerance bands overlap.

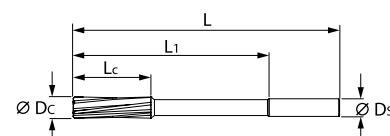
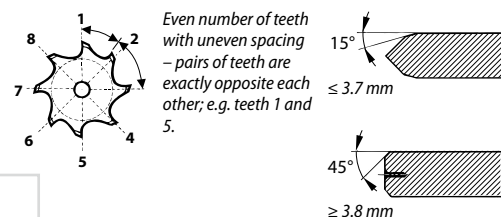
Note: Reamers in whole number sizes and 1/10 sizes for **H7 fit** see **No. 162900**.
For reamers with diameters and **fits to specification** see **No. 162951**.



16 2902



16 2902



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N						
16 2902		20	20		15	10	7	5	4				5	5	5	5	13						

Nominal Ø D _c	110 16 2902	Tolerance	L _c	L ₁	L	Ø D _s	Reaming oversize in Ø reference value
mm	NC reamer		mm	mm	mm	mm	mm/rev.
1,01	eShop	0 / 0.004	5.5	15	34	1	0.1
1,02	eShop	0 / 0.004	5.5	15	34	1	0.1
1,03	eShop	0 / 0.004	5.5	15	34	1	0.1
1,51	eShop	0 / 0.004	9	20	43	2	0.1
1,52	eShop	0 / 0.004	9	20	43	2	0.1
1,53	eShop	0 / 0.004	9	20	43	2	0.1
1,65	eShop	0 / 0.004	9	20	43	2	0.1
1,68	eShop	0 / 0.004	9	20	43	2	0.1
1,97	eShop	0 / 0.004	11	24	49	2	0.15
1,98	eShop	0 / 0.004	11	24	49	2	0.15
1,99	eShop	0 / 0.004	11	24	49	2	0.15
2,01	eShop	0 / 0.004	11	24	49	2	0.15
2,02	eShop	0 / 0.004	11	24	49	2	0.15
2,03	eShop	0 / 0.004	11	24	49	2	0.15
2,35	eShop	0 / 0.004	14	29	57	3	0.15
2,47	eShop	0 / 0.004	14	29	57	3	0.15
2,48	eShop	0 / 0.004	14	29	57	3	0.15
2,49	eShop	0 / 0.004	14	29	57	3	0.15
2,51	eShop	0 / 0.004	14	29	57	3	0.15
2,52	eShop	0 / 0.004	14	29	57	3	0.15
2,53	eShop	0 / 0.004	14	29	57	3	0.15

Nominal Ø D _c	110 16 2902	Tolerance	L _c	L ₁	L	Ø D _s	Reaming oversize in Ø reference value
mm	NC reamer		mm	mm	mm	mm	mm/rev.
2,55	eShop	0 / 0.004	14	29	57	3	0.15
2,62	eShop	0 / 0.004	15	33	61	3	0.15
2,83	eShop	0 / 0.004	15	33	61	3	0.2
2,97	eShop	0 / 0.004	15	33	61	3	0.2
2,98	eShop	0 / 0.004	15	33	61	3	0.2
2,99	eShop	0 / 0.004	15	33	61	3	0.2
3,00	eShop	0 / 0.004	15	33	61	3	0.2
3,01... 3,30	eShop	0 / 0.004	16	37	65	4	0.2
3,31... 3,75	eShop	0 / 0.004	18	42	70	4	0.2
3,76... 4,20	eShop	0 / 0.004	19	46	75	4	0.15
4,21... 4,75	eShop	0 / 0.004	21	51	80	5	0.15
4,76... 5,30	eShop	0 / 0.004	23	57	86	5	0.15
5,31... 5,50	eShop	0 / 0.004	26	56	93	6	0.2
5,51... 6,00	eShop	0 / 0.005	26	56	93	6	0.2
6,01... 6,70	eShop	0 / 0.005	28	64	101	6	0.2
6,71... 7,50	eShop	0 / 0.005	31	72	109	8	0.2
7,51... 8,50	eShop	0 / 0.005	33	80	117	8	0.25
8,51... 9,50	eShop	0 / 0.005	36	83	125	10	0.25
9,51... 10,60	eShop	0 / 0.005	38	92	133	10	0.25
10,61... 11,80	eShop	0 / 0.005	41	101	142	10	0.25
11,81... 12,05	eShop	0 / 0.005	44	110	151	10	0.25

The quick way to suitable reamers



Article number	Tolerance	orderable nominal $\varnothing$	Application	Advantage
16 2900	H7	whole number and 1/10 sizes	For H7 fit tolerances.	Optimally matched to H7 fit tolerances, guaranteed to achieve a long tool life and maintain high accuracy.
16 2902	0 / + 0.004 or 0 / + 0.005	1/100 sizes	For a large number of fit sizes, even outside H7. For a selection of suitable diameters see the table of fits below.	Attractively-priced reamers and quick availability.
16 2951	Configurable (freely selectable)	Configurable (freely selectable)	For any combination of diameter and fit.	The reamers are ground to specification. They are optimally matched to the desired fit tolerance. This results in longer tool life than for 1/100 reamers.

Example for fit 11F7:

Rearmers 16 2951 (size 11F7) that are ground for a specific fit lie in the upper part of the range and thus have a larger play for wear before they reach the wear limit.

In comparison to these the new reamer 16 2902 (size 11.02) has a somewhat smaller lower play.

Advantage: Attractive price and short lead times

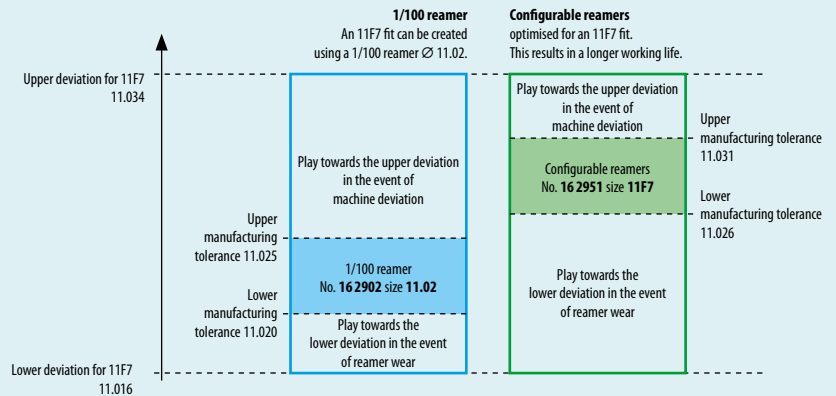


Table of fits for 1/100 machine reamers 16 2902

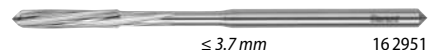
Fit	Hole diameter $\varnothing$																							
	1	1,5	2	2,5	3	3,5	3,7	4	4,5	5	5,5	6	6,5	7	7,5	7,8	8	8,5	9	9,5	10	10,2	10,5	11
D7	1.02	1.52	2.02	2.52	3.02	3.53	3.73	4.03	4.53	5.03	5.53	6.03	6.55	7.05	7.55	7.85	8.05	8.55	9.05	9.55	10.05	10.26	10.56	11.06
D8	1.03	1.53	2.03	2.53	3.03	3.54	3.74	4.04	4.54	5.04	5.54	6.04	6.55	7.05	7.55	7.85	8.05	8.55	9.05	9.55	10.05	10.27	10.57	11.07
D9	1.04	1.54	2.04	2.54	3.04	3.55	3.75	4.05	4.55	5.05	5.55	6.05	6.57	7.07	7.57	7.87	8.07	8.57	9.07	9.57	10.07	10.28	10.58	11.08
D10	1.05	1.55	2.05	2.55	3.05	3.57	3.77	4.07	4.57	5.07	5.57	6.07	6.58	7.08	7.58	7.88	8.08	8.58	9.08	9.58	10.08	10.30	10.60	11.10
D11	1.07	1.57	2.07	2.57	3.07	3.59	3.79	4.09	4.59	5.09	5.59	6.09	6.61	7.11	7.61	7.91	8.11	8.61	9.11	9.61	10.11	10.34	10.64	11.14
E7	1.02	1.52	2.02	2.52	3.02	3.52	3.72	4.02	4.52	5.02	5.52	6.02	6.53	7.03	7.53	7.83	8.03	8.53	9.03	9.53	10.03	10.24	10.54	11.04
E8	1.02	1.52	2.02	2.52	3.02	3.53	3.73	4.03	4.53	5.03	5.53	6.03	6.54	7.04	7.54	7.84	8.04	8.54	9.04	9.54	10.04	10.25	10.55	11.05
E9	1.03	1.53	2.03	2.53	3.03	3.54	3.74	4.04	4.54	5.04	5.54	6.04	6.55	7.05	7.55	7.85	8.05	8.55	9.05	9.55	10.05	10.26	10.56	11.06
E10	1.04	1.54	2.04	2.54	3.04	3.56	3.76	4.06	4.56	5.06	5.56	6.06	6.57	7.07	7.57	7.87	8.07	8.57	9.07	9.57	10.07	10.29	10.59	11.09
F6	-	-	-	-	-	3.51	3.71	4.01	4.51	5.01	5.51	6.01	-	-	-	-	-	-	-	-	-	10.22	10.52	11.02
F7	1.01	1.51	2.01	2.51	3.01	3.51	3.71	4.01	4.51	5.01	5.51	6.01	6.52	7.02	7.52	7.82	8.02	8.52	9.02	9.52	10.02	10.22	10.52	11.02
F8	1.01	1.51	2.01	2.51	3.01	3.52	3.72	4.02	4.52	5.02	5.52	6.02	6.53	7.03	7.53	7.83	8.03	8.53	9.03	9.53	10.03	10.23	10.53	11.03
F9	1.02	1.52	2.02	2.52	3.02	3.53	3.73	4.03	4.53	5.03	5.53	6.03	6.54	7.04	7.54	7.84	8.04	8.54	9.04	9.54	10.04	10.25	10.55	11.05
G7	-	-	-	-	-	3.51	3.71	4.01	4.51	5.01	5.51	6.01	6.51	7.01	7.51	7.81	8.01	8.51	9.01	9.51	10.01	10.21	10.51	11.01
H5	1.00	1.50	2.00	2.50	3.00	3.50	3.70	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	7.80	8.00	8.50	9.00	9.50	10.00	10.20	10.50	11.00
H6	1.00	1.50	2.00	2.50	3.00	3.50	3.70	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	7.80	8.00	8.50	9.00	9.50	10.00	10.20	10.50	11.00
H7	1.00	1.50	2.00	2.50	3.00	3.50	3.70	4.00	4.50	5.00	5.50	6.00	6.51	7.01	7.51	7.81	8.01	8.51	9.01	9.51	10.01	10.21	10.51	11.01
H8	1.01	1.51	2.01	2.51	3.01	3.51	3.71	4.01	4.51	5.01	5.51	6.01	6.51	7.01	7.51	7.81	8.01	8.51	9.01	9.51	10.01	10.22	10.52	11.02
H9	1.02	1.52	2.02	2.52	3.02	3.52	3.72	4.02	4.52	5.02	5.52	6.02	6.53	7.03	7.53	7.83	8.03	8.53	9.03	9.53	10.03	10.23	10.53	11.03
H10	1.03	1.53	2.03	2.53	3.03	3.54	3.74	4.04	4.54	5.04	5.54	6.04	6.54	7.04	7.54	7.84	8.04	8.54	9.04	9.54	10.04	10.25	10.55	11.05
H11	1.05	1.55	2.05	2.55	3.05	3.56	3.76	4.06	4.56	5.06	5.56	6.06	6.57	7.07	7.57	7.87	8.07	8.57	9.07	9.57	10.07	10.29	10.59	11.09
H12	1.08	1.58	2.08	2.58	3.08	3.60	3.80	4.10	4.60	5.10	5.60	6.10	6.62	7.12	7.62	7.92	8.12	8.62	9.12	9.62	10.12	10.35	10.65	11.15
J6	-	-	-	-	-	3.50	3.70	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	7.80	8.00	8.50	9.00	9.50	10.00	10.20	10.50	11.00
J7	1.00	1.50	2.00	2.50	3.00	3.50	3.70	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	7.80	8.00	8.50	9.00	9.50	10.00	10.20	10.50	11.00
JS6	-	-	-	-	-	3.50	3.70	4.00	4.50	5.00	-	-	-	-	-	-	-	-	-	-	-	10.20	10.50	11.00
JS7	1.00	1.50	2.00	2.50	3.00	3.50	3.70	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	7.80	8.00	8.50	9.00	9.50	10.00	10.20	10.50	11.00
K7	0.99	1.49	1.99	2.49	2.99	-	-	-	-	-	-	-	6.50	7.00	7.50	7.80	8.00	8.50	9.00	9.50	10.00	10.20	10.50	11.00
M6	-	-	-	-	-	-	-	-	-	-	-	-	6.49	6.99	7.49	7.79	7.99	8.49	8.99	9.49	9.99	10.19	10.49	10.99
M7	0.99	1.49	1.99	2.49	2.99	3.49	3.69	3.99	4.49	4.99	5.49	5.99	6.49	6.99	7.49	7.79	7.99	8.49	8.99	9.49	9.99	10.19	10.49	10.99
N6	0.99	1.49	1.99	2.49	2.99	3.49	3.69	3.99	4.49	4.99	5.49	5.99	-	-	-	-	-	-	-	-	-	10.18	10.48	10.98
N7	0.99	1.49	1.99	2.49	2.99	3.49	3.69	3.99	4.49	4.99	5.49	5.99	6.49	6.99	7.49	7.79	7.99	8.49	8.99	9.49	9.99	10.19	10.49	10.99
P6	0.99	1.49	1.99	2.49	2.99	-	-	-	-	-	-	-	6.48	6.98	7.48	7.78	7.98	8.48	8.98	9.48	9.98	10.18	10.48	10.98
P7	0.99	1.49	1.99	2.49	2.99	3.48	3.68	3.98	4.48	4.98	5.48	5.98	6.48	6.98	7.48	7.78	7.98	8.48	8.98	9.48	9.98	10.18	10.48	10.98
P8	0.99	1.49	1.99	2.49	2.99	3.48	3.68	3.98	4.48	4.98	5.48	5.98	6.48	6.98	7.48	7.78	7.98	8.48	8.98	9.48	9.98	10.17	10.47	10.97
P9	0.99	1.49	1.99	2.49	2.99	3.48	3.68	3.98	4.48	4.98	5.48	5.98	6.47	6.97	7.47	7.77	7.97	8.47	8.97	9.47	9.97	10.17	10.47	10.97
R6	-	-	-	-	-	3.48	3.68	3.98	4.48	4.98	5.48	5.98	-	-	-	-	-	-	-	-	-	10.17	10.47	10.97
R7	0.98	1.48	1.98	2.48	2.98	3.48	3.68	3.98	4.48	4.98	5.48	5.98	6.48	6.98	7.48	7.78	7.98	8.48	8.98	9.48	9.98	10.17	10.47	10.97
S7	0.98	1.48	1.98	2.48	2.98	3.48	3.68	3.98	4.48	4.98	5.48	5.98	6.47	6.97	7.47	7.77	7.97	8.47	8.97	9.47	9.97	10.17	10.47	10.97
S8	0.98	1.48	1.98	2.48	2.98	3.47	3.67	3.97	4.47	4.97	5.47	5.97	6.47	6.97	7.47	7.77	7.97	8.47	8.97	9.47	9.97	10.16	10.46	10.96
U7	-	-	-	-	-	3.47	3.67	3.97	4.47	4.97	5.47	5.97	6.47	6.97	7.47	7.77	7.97	8.47	8.97	9.47	9.97	10.16	10.46	10.96
X7	0.97	1.47	1.97	2.47	2.97	3.47	3.67	3.97	4.47	4.97	5.47	5.97	6.46	6.96	7.46	7.76	7.96	8.46	8.96	9.46	9.96	10.16	10.46	10.96
X8	0.97	1.47	1.97	2.47	2.97	3.46	3.66	3.96	4.46	4.96	5.46	5.96	6.46	6.96	7.46	7.76	7.96	8.46	8.96	9.46	9.96	10.15	10.45	10.95
Z8	0.97	1.47	1.97	2.47	2.97	3.46	3.66	3.96	4.46	4.96	5.46	5.96	6.45	6.95	7.45	7.75	7.95	8.45	8.95	9.45	9.95	10.14	10.44	10.94



16

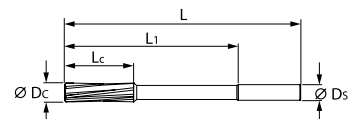


Garant NC machine reamers with whole-number shank Ø, non-standard sizes and fits



Reamers finish ground to match your specification.

Note: For fit H7 see No. 162900 and 163000.
For reamers in 1/100 - sizes see No. 162902.



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N						
16 2951		20	20		15	10	7	5	4				5	5	5	5	13						

Nominal Ø D _c	110 16 2951	Ø range	L _c	L ₁	L	Number of cutting edges Z	Ø D _s	f
	NC reamer							
	Configurable							
mm		mm	mm	mm	mm		mm	mm/rev.
1	(eShop)	0.95 – 1.06	5	13	34	3	1	0.1
1,1	(eShop)	1.07 – 1.18	6.5	14	36	3	1	0.1
1,2	(eShop)	1.19 – 1.32	7.5	13	38	3	2	0.1
1,4	(eShop)	1.33 – 1.41	8	15	40	3	2	0.1
1,5	(eShop)	1.42 – 1.5	8	15	40	3	2	0.1
1,6	(eShop)	1.51 – 1.7	9	17	43	3	2	0.1
1,8	(eShop)	1.71 – 1.9	10	20	46	3	2	0.15
2	(eShop)	1.91 – 2.12	11	22	49	4	2	0.15
2,2	(eShop)	2.13 – 2.36	12	21	53	4	3	0.15
2,5	(eShop)	2.37 – 2.65	14	26	57	4	3	0.15
2,8	(eShop)	2.66 – 2.8	15	30	61	4	3	0.2
3	(eShop)	2.81 – 3	15	30	61	6	3	0.2
3,2	(eShop)	3.01 – 3.35	16	33	65	6	4	0.2
3,5	(eShop)	3.36 – 3.75	18	39	75	6	4	0.2
4	(eShop)	3.76 – 4.05	19	46	75	6	4	0.15
4,3	(eShop)	4.06 – 4.25	19	46	75	6	4	0.15
4,5	(eShop)	4.26 – 4.75	21	51	80	6	5	0.15
5	(eShop)	4.76 – 5.05	23	57	86	6	5	0.2
5,3	(eShop)	5.06 – 5.3	23	57	86	6	5	0.2
5,5	(eShop)	5.31 – 5.6	26	56	93	6	6	0.2
6	(eShop)	5.61 – 6	26	56	93	6	6	0.2
6,5	(eShop)	6.01 – 6.7	28	64	101	6	6	0.2
7	(eShop)	6.71 – 7.05	31	72	109	6	8	0.2
7,5	(eShop)	7.06 – 7.5	31	72	109	6	8	0.2
8	(eShop)	7.51 – 8.05	33	80	117	6	8	0.25

Nominal Ø D _c	110 16 2951	Ø range	L _c	L ₁	L	Number of cutting edges Z	Ø D _s	f
	NC reamer							
	Configurable							
mm		mm	mm	mm	mm		mm	mm/rev.
8,5	(eShop)	8.06 – 8.5	33	80	117	6	8	0.25
9	(eShop)	8.51 – 9.05	36	84	125	6	10	0.25
9,5	(eShop)	9.06 – 9.5	36	84	125	6	10	0.25
10	(eShop)	9.51 – 10.05	38	92	133	6	10	0.25
10,5	(eShop)	10.06 – 10.6	38	92	133	6	10	0.25
11	(eShop)	10.61 – 11.05	41	101	142	6	10	0.25
11,5	(eShop)	11.06 – 11.8	41	101	142	6	10	0.25
12	(eShop)	11.81 – 12.05	44	110	151	6	10	0.25
12,5	(eShop)	12.06 – 12.6	44	110	151	6	10	0.25
13	(eShop)	12.61 – 13.2	44	110	151	6	10	0.25
13,5	(eShop)	13.21 – 13.55	47	113	160	8	14	0.3
14	(eShop)	13.56 – 14	47	113	160	8	14	0.3
14,5	(eShop)	14.01 – 14.5	50	115	162	8	14	0.3
15	(eShop)	14.51 – 15	50	115	162	8	14	0.3
15,5	(eShop)	15.01 – 15.5	52	123	170	8	14	0.3
16	(eShop)	15.51 – 16	52	123	170	8	14	0.3
16,5	(eShop)	16.01 – 16.5	54	129	175	8	14	0.3
17	(eShop)	16.51 – 17	54	129	175	8	14	0.3
17,5	(eShop)	17.01 – 17.5	56	136	182	8	14	0.3
18	(eShop)	17.51 – 18	56	136	182	8	14	0.3
18,5	(eShop)	18.01 – 18.5	58	140	189	8	16	0.3
19	(eShop)	18.51 – 19	58	140	189	8	16	0.3
19,5	(eShop)	19.01 – 19.5	60	146	195	8	16	0.3
20	(eShop)	19.51 – 20	60	146	195	8	16	0.3



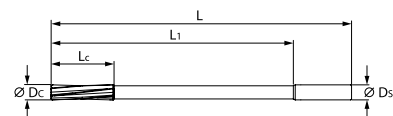
Garant NC machine reamers, whole-number shank Ø



With long flutes and left-hand helix.

Reamers finish ground for fit H7.

Application: Especially for deeper holes.
Also suitable for blind holes.



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N						
16 2961/2971		20	20		15	10	7	5	4				5	5	5	5	13						

Nominal Ø D _c	110 16 2961	110 16 2971	L _c	L ₁	L	Number of cutting edges Z	Ø D _s	f	Reaming oversize in Ø reference value
	NC reamer								
	long H7	extra long H7		16 2961 mm	16 2971 mm	16 2961 mm	16 2971 mm		
mm			mm	mm	mm	mm	mm	mm/rev.	mm
2	eShop	eShop	11	44	64	65	85	4	0.05 – 0.1
3	eShop	eShop	15	69	99	90	120	6	0.1
4	eShop	eShop	19	79	134	105	160	6	0.1
5	eShop	eShop	23	89	174	115	200	6	0.1
6	eShop	eShop	26	99	219	130	250	6	0.1 – 0.2
8	eShop	eShop	33	129	219	160	250	6	0.1 – 0.2
10	eShop	eShop	38	148	219	175	250	6	0.1 – 0.2
12	eShop	eShop	44	159	249	210	300	6	0.1 – 0.2



Garant Machine reamers plain shank

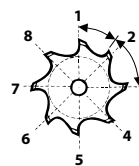
With long flutes and left-hand helix.
From size 1.8 even number of teeth and uneven spacing.
Up to size 3.7 both ends with external centres;
from size 3.9 both ends with internal centres.

Reamers finish ground for fit H7.

Application: For reaming through holes.
Also suitable for blind holes (from 3.9 mm Ø)
due to short chamfer lead.

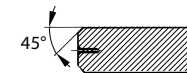
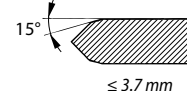
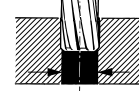
Note:

- Straight flute machine chucking reamers – available ex-stock.
- **For reamers with other diameters and fits see No. 162951.**

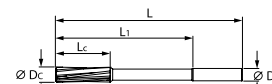


Even number of teeth with irregular spacing – pairs of teeth are exactly opposite each other; e. g. teeth 1 and 5.

Chamfer lead forms:


$$163000 \geq 3.9 \text{ mm}$$


Correct undersize for pre-drilled holes can be found in the machining handbook.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu 	Alu cast > 10% Si 	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	INOX  < 900 N	INOX  > 900 N	Ti  > 850 N	GG(G) 	CuZn 	Uni 						
	ISO code	N	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N						
	16 3000	20	20	20	15	10	7	5	4				5	5	5	5	13							

Nominal Ø D _c	110	L ₁	L	Ø D _s		Reaming oversize in Ø refer- ence value	Nominal Ø D _c	110	L ₁	L	Ø D _s		Reaming oversize in Ø refer- ence value	Nominal Ø D _c	110	L ₁	L	Ø D _s		Reaming oversize in Ø refer- ence value
	16 3000							16 3000							16 3000					
	Machine reamer							Machine reamer							Machine reamer					
H7	H7	H7																		
mm	mm	mm	mm	mm/rev.	mm	mm	mm	mm	mm/rev.	mm	mm	mm	mm/rev.	mm	mm	mm	mm	mm/rev.	mm	
1,5	eShop	16	40	1.5	0.1	0.05 – 0.1	3,7	eShop	38	70	3.5	0.2	0.1	6,6	(eShop)	64	101	6.3	0.2	0.1 – 0.2
1,6	eShop	18	43	1.6	0.1	0.05 – 0.1	3,9	(eShop)	46	75	4	0.15	0.1	7	eShop	72	109	7.1	0.2	0.1 – 0.2
1,7	eShop	18	43	1.6	0.1	0.05 – 0.1	4	eShop	46	75	4	0.15	0.1	7,3	(eShop)	72	109	7.1	0.2	0.1 – 0.2
1,8	eShop	20	46	1.8	0.15	0.05 – 0.1	4,1	eShop	46	75	4	0.15	0.1	7,5	eShop	72	109	7.1	0.2	0.1 – 0.2
1,9	eShop	20	46	1.8	0.15	0.05 – 0.1	4,2	eShop	46	75	4	0.15	0.1	8	eShop	80	117	8	0.25	0.1 – 0.2
2	eShop	22	49	2	0.15	0.05 – 0.1	4,3	(eShop)	51	80	4.5	0.15	0.1	8,1	eShop	80	117	8	0.25	0.1 – 0.2
2,1	eShop	22	49	2	0.15	0.05 – 0.1	4,4	(eShop)	51	80	4.5	0.15	0.1	8,2	eShop	80	117	8	0.25	0.1 – 0.2
2,2	eShop	24	53	2.2	0.15	0.05 – 0.1	4,5	eShop	51	80	4.5	0.15	0.1	8,5	eShop	80	117	8	0.25	0.1 – 0.2
2,3	eShop	24	53	2.2	0.15	0.05 – 0.1	4,6	(eShop)	51	80	4.5	0.15	0.1	9	eShop	84	125	9	0.25	0.1 – 0.2
2,4	(eShop)	26	57	2.5	0.15	0.05 – 0.1	4,7	(eShop)	51	80	4.5	0.15	0.1	9,5	eShop	84	125	9	0.25	0.1 – 0.2
2,5	eShop	26	57	2.5	0.15	0.05 – 0.1	5	eShop	57	86	5	0.2	0.1	10	eShop	92	133	10	0.25	0.1 – 0.2
2,6	eShop	26	57	2.5	0.15	0.05 – 0.1	5,1	eShop	57	86	5	0.2	0.1	11	eShop	101	142	10	0.25	0.1 – 0.2
2,7	eShop	30	61	2.8	0.2	0.05 – 0.1	5,2	eShop	57	86	5	0.2	0.1	12	eShop	110	151	10	0.25	0.1 – 0.2
2,8	eShop	30	61	2.8	0.2	0.05 – 0.1	5,5	eShop	56	93	5.6	0.2	0.1	13	eShop	110	151	10	0.25	0.2 – 0.3
2,9	(eShop)	29	61	3	0.2	0.05 – 0.1	5,6	(eShop)	56	93	5.6	0.2	0.1 – 0.2	14	eShop	114	160	12.5	0.3	0.2 – 0.3
3	eShop	29	61	3	0.2	0.1	5,7	(eShop)	56	93	5.6	0.2	0.1 – 0.2	15	eShop	116	162	12.5	0.3	0.2 – 0.3
3,1	eShop	33	65	3.2	0.2	0.1	5,8	(eShop)	56	93	5.6	0.2	0.1 – 0.2	16	eShop	124	170	12.5	0.3	0.2 – 0.3
3,2	eShop	33	65	3.2	0.2	0.1	6	eShop	56	93	5.6	0.2	0.1 – 0.2	17	eShop	129	175	14	0.3	0.2 – 0.3
3,3	(eShop)	33	65	3.2	0.2	0.1	6,1	eShop	64	101	6.3	0.2	0.1 – 0.2	18	eShop	136	182	14	0.3	0.2 – 0.3
3,4	eShop	38	70	3.5	0.2	0.1	6,2	eShop	64	101	6.3	0.2	0.1 – 0.2	19	eShop	140	189	16	0.3	0.2 – 0.3
3,5	eShop	38	70	3.5	0.2	0.1	6,4	(eShop)	64	101	6.3	0.2	0.1 – 0.2	20	eShop	146	195	16	0.3	0.2 – 0.3
3,6	(eShop)	38	70	3.5	0.2	0.1	6,5	eShop	64	101	6.3	0.2	0.1 – 0.2							



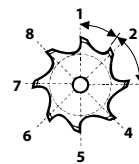
Garant Machine reamers plain shank

With long flutes and left-hand helix. Even number of teeth with irregular spacing.

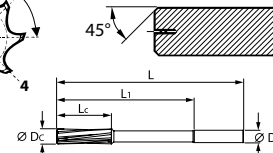
Application: For reaming through holes, as the swarf is evacuated in the direction of cutting.



Even number of teeth with irregular spacing – pairs of teeth are exactly opposite each other, z. g. teeth 1 and 5.



Chamfer lead forms:



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si 												INOX 	INOX 	Ti 	GG(G)	CuZn 								
	ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N	N	●	●				
	16 3500			15	10	9	7	5									7	7	18								

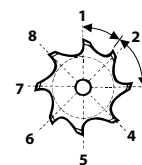
Nominal Ø D _c	110	16 3500	L _c	L ₁	L	Ø D _s	 f < 750 N	Reaming oversize in Ø reference value	Nominal Ø D _c	110	16 3500	L _c	L ₁	L	Ø D _s	 f < 750 N	Reaming oversize in Ø reference value
	Machine reamer									Machine reamer							
	H7									H7							
	TiN									TiN							
mm			mm	mm	mm	mm	mm/rev.	mm	mm		mm	mm	mm	mm	mm/rev.	mm	
4		eShop	19	44	75	4	0.15	0.1	10		eShop	38	89	133	10	0.23	0.1 – 0.2
5		eShop	23	54	86	5	0.15	0.1	11		(eShop)	41	98	142	10	0.23	0.1 – 0.2
6		eShop	26	53	93	5.6	0.2	0.1 – 0.2	12		eShop	44	106	151	10	0.23	0.1 – 0.2
7		eShop	31	69	109	7.1	0.2	0.1 – 0.2	14		eShop	47	110	160	12.5	0.23	0.2 – 0.3
8		eShop	33	77	117	8	0.2	0.1 – 0.2	16		eShop	52	120	170	12.5	0.3	0.2 – 0.3
9		(eShop)	36	81	125	9	0.2	0.1 – 0.2	20		(eShop)	60	142	195	16	0.38	0.2 – 0.3

HSS
EDIN
208 B

HOLEX Machine reamers with Morse taper shank

Even number of teeth with irregular spacing. The hole is accurately round and free of chatter marks. The cylindrical ground land on the plain cutting section smooths the hole and guides the reamer. With Morse taper shank.

Application: For reaming through holes, as the chips are evacuated in the cutting direction. Also suitable for blind holes due to the short chamfer lead.



Even number of teeth with uneven spacing; two teeth are exactly opposite each other, e.g. 1 and 5.

Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu	Alu cast > 10 % Si										INOX	INOX	Ti	GG(G)	Cu					
ISO code	N	N	N	N	P	P	P	P	P	P	P	P	P	H	H	H	H	M	M	S	K	N	
16 4000/4180		20	20		15	10	7	5	4									5	5	5	5	13	

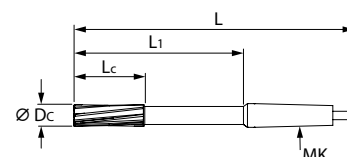
Reamers for fit H7

H7

Reamers finish ground for fit H7.



16 4000



Nominal $\varnothing D_c$	120 16 4000	L_c	L_1	L	MT		Reaming oversize in $\varnothing$ reference value
mm	H7	mm	mm	mm		mm/rev.	mm
5	eShop	23	63	133	1	0.1	0.1
6	eShop	26	68	138	1	0.1	0.1 – 0.2
7	eShop	31	81	150	1	0.1	0.1 – 0.2
8	eShop	33	88	156	1	0.13	0.1 – 0.2
9	eShop	36	94	162	1	0.13	0.1 – 0.2
10	eShop	38	100	168	1	0.15	0.1 – 0.2
11	eShop	41	108	175	1	0.15	0.1 – 0.2
12	eShop	44	115	182	1	0.15	0.1 – 0.2
13	eShop	44	115	182	1	0.15	0.2 – 0.3
14	eShop	47	122	189	1	0.15	0.2 – 0.3
15	eShop	50	121	204	2	0.2	0.2 – 0.3
16	eShop	52	127	210	2	0.2	0.2 – 0.3
17	eShop	54	132	214	2	0.2	0.2 – 0.3
18	eShop	56	137	219	2	0.2	0.2 – 0.3
19	eShop	58	142	223	2	0.2	0.2 – 0.3
20	eShop	60	147	228	2	0.25	0.2 – 0.3
22	eShop	64	156	237	2	0.25	0.2 – 0.3

Nominal $\varnothing D_c$	120 16 4000	L_c	L_1	L	MT		Reaming oversize in $\varnothing$ reference value
mm	H7	mm	mm	mm		mm/rev.	mm
23	eShop	66	160	241	2	0.25	0.2 – 0.3
24	eShop	68	167	268	3	0.25	0.2 – 0.3
25	eShop	68	174	268	3	0.25	0.3 – 0.5
26	eShop	70	172	273	3	0.25	0.3 – 0.5
28	eShop	71	177	277	3	0.25	0.3 – 0.5
30	eShop	73	181	281	3	0.3	0.3 – 0.5
32	eShop	77	190	317	4	0.3	0.3 – 0.5
34	eShop	78	194	321	4	0.3	0.3 – 0.5
35	eShop	78	195	321	4	0.3	0.3 – 0.5
36	(eShop)	79	200	325	4	0.3	0.3 – 0.5
38	eShop	81	204	329	4	0.3	0.3 – 0.5
40	eShop	81	204	329	4	0.35	0.3 – 0.5
42	eShop	82	211	333	4	0.35	0.3 – 0.5
44	(eShop)	83	215	336	4	0.35	0.3 – 0.5
45	eShop	83	215	336	4	0.35	0.3 – 0.5
50	eShop	86	224	344	4	0.4	0.3 – 0.5

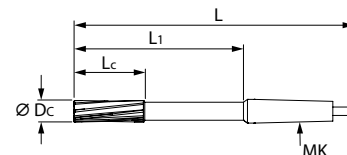
Reamers similar to No. 16 4000, non-standard sizes and fits

Reamers finish ground to match your specification.

Note: For H7 fits see No. 16 4000.



16 4180



Nominal $\varnothing D_c$	120 16 4180	$\varnothing$ range	L_c	L_1	L	MT	
mm	configurable	mm	mm	mm	mm		f
3	(eShop)	2.81 – 3.35	15	42	114.5	1	0.08
3,5	(eShop)	3.36 – 3.75	18	42	114.8	1	0.08
4	(eShop)	3.76 – 4.05	19	54	124	1	0.1
4,5	(eShop)	4.06 – 4.75	23	63	133	1	0.1
5	(eShop)	4.76 – 5.05	23	63	133	1	0.1
5,5	(eShop)	5.06 – 5.6	26	68	138	1	0.1
6	(eShop)	5.61 – 6	26	72	138	1	0.1
6,5	(eShop)	6.01 – 6.7	31	81	150	1	0.1
7	(eShop)	6.71 – 7.05	31	81	150	1	0.1
7,5	(eShop)	7.06 – 7.5	33	88	156	1	0.1

Nominal $\varnothing D_c$	120 16 4180	$\varnothing$ range	L_c	L_1	L	MT	
mm	configurable	mm	mm	mm	mm		f
8	(eShop)	7.51 – 8.05	33	88	156	1	0.13
8,5	(eShop)	8.06 – 8.5	36	94	162	1	0.13
9	(eShop)	8.51 – 9.05	36	94	162	1	0.13
9,5	(eShop)	9.06 – 9.5	38	100	168	1	0.13
10	(eShop)	9.51 – 10.05	38	100	168	1	0.15
10,5	(eShop)	10.06 – 10.6	41	108	175	1	0.15
11	(eShop)	10.61 – 11.05	41	108	175	1	0.15
11,5	(eShop)	11.06 – 11.8	44	115	182	1	0.15
12	(eShop)	11.81 – 12.05	44	115	182	1	0.15
12,5	(eShop)	12.06 – 12.6	44	115	182	1	0.15

Nominal $\varnothing D_c$	120 16 4180	$\varnothing$ range	L_c	L_1	L	MT	 f
	Machine reamer						
	configurable						
mm		mm	mm	mm	mm		mm/rev.
13	(eShop)	12.61 – 13.2	44	115	182	1	0.15
13,5	(eShop)	13.21 – 13.55	47	122	189	1	0.15
14	(eShop)	13.56 – 14	47	122	189	1	0.15
14,5	(eShop)	14.01 – 14.5	50	121	204	2	0.15
15	(eShop)	14.51 – 15.05	50	121	204	2	0.2
15,5	(eShop)	15.06 – 15.5	52	127	210	2	0.2
16	(eShop)	15.51 – 16	52	127	210	2	0.2
16,5	(eShop)	16.01 – 16.5	54	132	214	2	0.2
17	(eShop)	16.51 – 17	54	132	214	2	0.2
17,5	(eShop)	17.01 – 17.5	56	137	219	2	0.2
18	(eShop)	17.51 – 18	56	137	219	2	0.2
18,5	(eShop)	18.01 – 18.5	58	142	223	2	0.2
19	(eShop)	18.51 – 19	58	142	223	2	0.2
19,5	(eShop)	19.01 – 19.5	60	147	228	2	0.2
20	(eShop)	19.51 – 20	60	147	228	2	0.25
21	(eShop)	20.01 – 21.2	62	151	232	2	0.25
22	(eShop)	21.21 – 22.4	64	156	237	2	0.25
23	(eShop)	22.41 – 23.05	66	160	241	2	0.25
24	(eShop)	23.06 – 24.05	68	167	268	3	0.25
25	(eShop)	24.06 – 25	68	167	268	3	0.25
26	(eShop)	25.01 – 26.05	70	172	273	3	0.25
27	(eShop)	26.06 – 27.05	71	177	277	3	0.25
28	(eShop)	27.06 – 28	71	177	277	3	0.25

Nominal $\varnothing D_c$	120 16 4180	$\varnothing$ range	L_c	L_1	L	MT	 f
	Machine reamer						
	configurable						
mm		mm	mm	mm	mm		mm/rev.
29	(eShop)	28.01 – 29.05	73	181	281	3	0.25
30	(eShop)	29.06 – 30	73	181	281	3	0.3
31	(eShop)	30.01 – 31.05	75	185	285	3	0.3
32	(eShop)	31.06 – 32.05	77	190	317	4	0.3
33	(eShop)	32.06 – 33.05	77	190	317	4	0.3
34	(eShop)	33.06 – 34.05	78	194	321	4	0.3
35	(eShop)	34.06 – 35.05	78	195	321	4	0.3
36	(eShop)	35.06 – 36.05	79	200	325	4	0.3
37	(eShop)	36.06 – 37.05	79	200	325	4	0.3
38	(eShop)	37.06 – 38.05	81	204	329	4	0.3
39	(eShop)	38.06 – 39.05	81	204	329	4	0.3
40	(eShop)	39.06 – 40	81	204	329	4	0.35
41	(eShop)	40.01 – 41.05	82	211	333	4	0.35
42	(eShop)	41.06 – 42.05	82	211	333	4	0.35
43	(eShop)	42.51 – 43.05	83	215	336	4	0.35
44	(eShop)	43.06 – 44.05	83	215	336	4	0.35
45	(eShop)	44.06 – 45	83	215	336	4	0.35
46	(eShop)	45.01 – 46.05	84	219	340	4	0.35
47	(eShop)	46.06 – 47.05	84	219	340	4	0.35
48	(eShop)	47.06 – 48.05	86	224	344	4	0.35
49	(eShop)	48.06 – 49.05	86	224	344	4	0.35
50	(eShop)	49.06 – 50	86	224	344	4	0.4

H7

Carbide
K10DIN
8093

h6



Garant Carbide machine reamers

Long flutes, left-hand helix.

Extremely irregular spacing (EU) from size 2.

This ensures that the reamed bore is absolutely round and free from chatter marks.

Size 1–3,5 – With centring tip.

Tool material: Sizes 1 – 13 **solid carbide**.

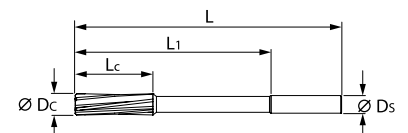
Sizes 14 – 16 with **carbide inserts**, supported by hard nitrided steel guide chamfers.

Application: On stable, low vibration machines.

Longer tool life and better dimensional accuracy than HSS reamers.

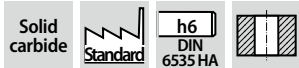


16 4500



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10% Si											INOX	INOX	Ti	CuZn					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
16 4500		35	30		20	13	10	8	6						10			20					

Nominal $\varnothing D_c$	110 16 4500	L_c	L_1	L	Number of cutting edges Z	$\varnothing D_s$	 f	Reaming oversize in $\varnothing$ reference value
	Carbide machine reamer							
	H7							
mm		mm	mm	mm		mm	mm/rev.	mm
1	eShop	5.5	14	34	3	1	0.12	0.05 – 0.1
1,2	eShop	7.5	16	38	3	1.2	0.12	0.05 – 0.1
1,5	eShop	8	17	40	3	1.5	0.12	0.05 – 0.1
2	eShop	11	23	49	4	2	0.12	0.05 – 0.1
2,5	eShop	14	27	57	4	2.5	0.12	0.05 – 0.1
3	eShop	15	29	61	6	3	0.12	0.1 – 0.2
3,5	eShop	18	32	70	6	3.5	0.12	0.1 – 0.2
4	eShop	19	43	75	6	4	0.12	0.1 – 0.2
4,5	eShop	21	45	80	6	4.5	0.12	0.1 – 0.2
5	eShop	23	52	86	6	5	0.12	0.1 – 0.2
5,5	(eShop)	26	55	93	6	5.6	0.12	0.1 – 0.2
6	eShop	26	55	93	6	5.6	0.12	0.1 – 0.2
6,5	(eShop)	28	62	101	6	6.3	0.12	0.1 – 0.2
7	eShop	31	68	109	6	7.1	0.12	0.1 – 0.2
8	eShop	33	74	117	6	8	0.15	0.1 – 0.2
9	eShop	36	80	125	6	9	0.15	0.1 – 0.2
9,5	(eShop)	36	80	125	6	9	0.15	0.1 – 0.2
10	eShop	38	86	133	6	10	0.15	0.1 – 0.2
11	(eShop)	41	95	142	6	10	0.15	0.1 – 0.2
12	eShop	44	102	151	6	10	0.15	0.1 – 0.2
13	(eShop)	44	104	151	6	10	0.15	0.2
14	eShop	47	109	160	6	12.5	0.15	0.2
15	eShop	50	111	162	6	12.5	0.18	0.2
16	eShop	52	119	170	6	12.5	0.18	0.2

H7 0
+0.004 $\varnothing \leq 0,9$ **Garant Universal solid carbide NC machine reamers**

Version suitable for NC similar to DIN 8093 with straight shank $\varnothing$ for standard chucking especially in hydraulic chucks or high precision collet chucks.

This ensures the highest concentricity.

Tolerance specifications:

Size 0.6 – 0.9: Manufacturing or cutting edge tolerance 0/+0.004 mm.

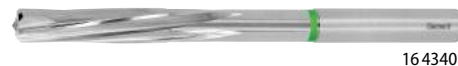
Size 0.98 – 20: Reamer manufacturing or cutting edge tolerance to DIN1420 for H7 bore tolerance.

No need to procure special collets when using GARANT-NC reamers.

With long flutes and left-hand helix.

Application: For reaming through holes, as the chips are evacuated in the cutting direction. Lead taper is suitable also for blind holes.

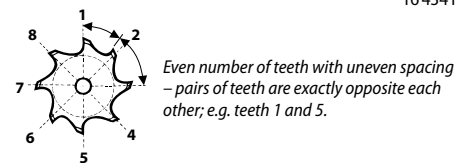
Note: For reamers like No. 164340 and 164341 but with other diameters and fits see No. 164344 and 164345.



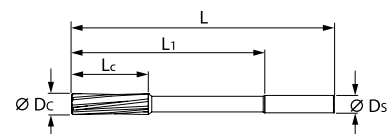
164340



164341



Even number of teeth with uneven spacing – pairs of teeth are exactly opposite each other; e.g. teeth 1 and 5.

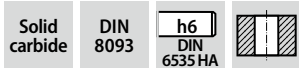


Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N						
164340		35	30		20	13	10	8	6				10	8	8	8	20	●		●			
164341		35	30	25	30	25	20	15	10				15	12	10	10	25	●		●			

Nominal $\varnothing D_c$	11P 164340	11P 164341	Tolerance	L _c	L ₁	L	Number of cutting edges Z	$\varnothing D_s$	 f	Reaming oversize in $\varnothing$ reference value
mm	Solid carbide NC machine reamer			mm	mm	mm		mm	mm/rev.	mm
mm	TiAlN			mm	mm	mm		mm	mm/rev.	mm
0,60	eShop	—	0 / 0.004	5	7.5	45	4	3	0.08	0.05 – 0.1
0,70	eShop	—	0 / 0.004	5	7.5	45	4	3	0.08	0.05 – 0.1
0,80	eShop	—	0 / 0.004	6	8	45	4	3	0.08	0.05 – 0.1
0,90	eShop	—	0 / 0.004	6	8	45	4	3	0.08	0.05 – 0.1
0,98	eShop	eShop	H7	6	16	50	3	4	0.08	0.05 – 0.1
0,99	eShop	eShop	H7	6	16	50	3	4	0.08	0.05 – 0.1
1	eShop	eShop	H7	6	16	50	3	4	0.08	0.05 – 0.1
1,01	eShop	eShop	H7	6	16	50	3	4	0.08	0.05 – 0.1
1,02	eShop	eShop	H7	6	16	50	3	4	0.08	0.05 – 0.1
1,03	eShop	—	H7	6	16	50	3	4	0.08	0.05 – 0.1
1,48	eShop	eShop	H7	9	16	50	3	4	0.08	0.05 – 0.1
1,49	eShop	eShop	H7	9	16	50	3	4	0.08	0.05 – 0.1
1,5	eShop	eShop	H7	9	16	50	3	4	0.08	0.05 – 0.1
1,51	eShop	eShop	H7	9	16	50	3	4	0.08	0.05 – 0.1
1,52	eShop	eShop	H7	9	16	50	3	4	0.08	0.05 – 0.1
1,6	eShop	eShop	H7	10	16	50	3	4	0.08	0.05 – 0.1
1,7	eShop	eShop	H7	10	16	50	3	4	0.08	0.05 – 0.1
1,8	eShop	eShop	H7	11	16	50	3	4	0.08	0.05 – 0.1
1,9	—	eShop	H7	11	16	50	3	4	0.08	0.05 – 0.1
1,98	eShop	eShop	H7	12	16	50	4	4	0.08	0.05 – 0.1
1,99	eShop	eShop	H7	12	16	50	4	4	0.08	0.05 – 0.1
2	eShop	eShop	H7	12	16	50	4	4	0.1	0.05 – 0.1
2,01	eShop	eShop	H7	12	16	50	4	4	0.1	0.05 – 0.1
2,02	eShop	eShop	H7	12	16	50	4	4	0.1	0.05 – 0.1
2,03	eShop	eShop	H7	12	16	50	4	4	0.1	0.05 – 0.1
2,4	—	eShop	H7	16	26	60	4	4	0.1	0.05 – 0.1
2,5	eShop	eShop	H7	16	26	60	4	4	0.1	0.05 – 0.1
2,6	eShop	eShop	H7	16	26	60	4	4	0.1	0.05 – 0.1
2,7	—	eShop	H7	17	30	64	4	4	0.1	0.05 – 0.1
2,8	—	eShop	H7	17	30	64	4	4	0.1	0.05 – 0.1
2,9	—	eShop	H7	17	30	64	4	4	0.1	0.05 – 0.1
2,97	eShop	eShop	H7	17	30	64	4	4	0.1	0.05 – 0.1
2,98	eShop	eShop	H7	17	30	64	4	4	0.1	0.05 – 0.1
2,99	eShop	eShop	H7	17	30	64	4	4	0.1	0.05 – 0.1
3	eShop	eShop	H7	17	30	64	4	4	0.12	0.1 – 0.2
3,01	eShop	eShop	H7	17	30	64	4	4	0.12	0.1 – 0.2
3,02	eShop	eShop	H7	17	30	64	4	4	0.12	0.1 – 0.2
3,03	eShop	eShop	H7	17	30	64	4	4	0.12	0.1 – 0.2
3,1	eShop	eShop	H7	18	34	68	4	4	0.12	0.1 – 0.2
3,2	eShop	eShop	H7	18	34	68	4	4	0.12	0.1 – 0.2
3,3	eShop	eShop	H7	18	34	68	4	4	0.12	0.1 – 0.2
3,4	—	eShop	H7	20	40	74	4	4	0.12	0.1 – 0.2
3,5	eShop	eShop	H7	20	40	74	4	4	0.12	0.1 – 0.2
3,6	eShop	eShop	H7	20	40	74	4	4	0.12	0.1 – 0.2
3,7	—	eShop	H7	20	40	74	4	4	0.12	0.1 – 0.2
3,8	—	eShop	H7	21	43	77	4	4	0.12	0.1 – 0.2
3,97	eShop	eShop	H7	21	43	77	4	4	0.12	0.1 – 0.2
3,98	eShop	eShop	H7	21	43	77	4	4	0.12	0.1 – 0.2
3,99	eShop	eShop	H7	21	43	77	4	4	0.12	0.1 – 0.2
4	eShop	eShop	H7	21	43	77	4	4	0.12	0.1 – 0.2
4,01	eShop	eShop	H7	21	43	77	4	4	0.12	0.1 – 0.2
4,02	eShop	eShop	H7	21	43	77	4	4	0.12	0.1 – 0.2
4,03	eShop	eShop	H7	21	43	77	4	4	0.12	0.1 – 0.2
4,1	eShop	eShop	H7	21	40	82	6	6	0.12	0.1 – 0.2

Nominal $\varnothing D_c$	TTP	16 4340	TTP	16 4341	Tolerance	L_c	L_1	L	Number of cutting edges Z	$\varnothing D_s$	 f mm/rev.	Reaming oversize in $\varnothing$ reference value
mm		Solid carbide NC machine reamer				mm	mm	mm		mm		mm
			TiAlN									
4,2	eShop		eShop		H7	21	40	82	6	6	0.12	0.1 – 0.2
4,3	eShop		eShop		H7	23	40	82	6	6	0.12	0.1 – 0.2
4,4	eShop		eShop		H7	23	40	82	6	6	0.12	0.1 – 0.2
4,5	eShop		eShop		H7	23	40	82	6	6	0.12	0.1 – 0.2
4,6	–		eShop		H7	23	40	82	6	6	0.12	0.1 – 0.2
4,8	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
4,9	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
4,97	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
4,98	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
4,99	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,01	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,02	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,03	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,1	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,2	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,3	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,5	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,6	–		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,7	–		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,8	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,98	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
5,99	eShop		eShop		H7	26	51	93	6	6	0.12	0.1 – 0.2
6	eShop		eShop		H7	26	51	93	6	6	0.14	0.1 – 0.2
6,01	eShop		eShop		H7	26	51	93	6	6	0.14	0.1 – 0.2
6,02	eShop		eShop		H7	26	51	93	6	6	0.14	0.1 – 0.2
6,03	eShop		eShop		H7	26	51	93	6	6	0.14	0.1 – 0.2
6,1	eShop		eShop		H7	26	59	101	6	8	0.14	0.1 – 0.2
6,2	eShop		eShop		H7	26	59	101	6	8	0.14	0.1 – 0.2
6,3	eShop		eShop		H7	26	59	101	6	8	0.14	0.1 – 0.2
6,4	eShop		eShop		H7	26	59	101	6	8	0.14	0.1 – 0.2
6,5	eShop		eShop		H7	26	59	101	6	8	0.14	0.1 – 0.2
6,6	eShop		eShop		H7	26	59	101	6	8	0.14	0.1 – 0.2
6,7	eShop		eShop		H7	26	59	101	6	8	0.14	0.1 – 0.2
6,9	eShop		–		H7	31	67	109	6	8	0.14	0.1 – 0.2
7	eShop		eShop		H7	31	67	109	6	8	0.14	0.1 – 0.2
7,2	eShop		eShop		H7	31	67	109	6	8	0.14	0.1 – 0.2
7,5	eShop		eShop		H7	31	67	109	6	8	0.14	0.1 – 0.2
7,6	eShop		eShop		H7	31	67	109	6	8	0.14	0.1 – 0.2
7,7	–		eShop		H7	33	75	117	6	8	0.14	0.1 – 0.2
7,97	eShop		eShop		H7	33	75	117	6	8	0.14	0.1 – 0.2
7,98	eShop		eShop		H7	33	75	117	6	8	0.14	0.1 – 0.2
7,99	eShop		eShop		H7	33	75	117	6	8	0.14	0.1 – 0.2
8	eShop		eShop		H7	33	75	117	6	8	0.15	0.1 – 0.2
8,01	eShop		eShop		H7	33	75	117	6	8	0.15	0.1 – 0.2
8,02	eShop		eShop		H7	33	75	117	6	8	0.15	0.1 – 0.2
8,03	eShop		eShop		H7	33	75	117	6	8	0.15	0.1 – 0.2
8,1	eShop		eShop		H7	33	71	117	6	10	0.15	0.1 – 0.2
8,2	eShop		eShop		H7	33	71	117	6	10	0.15	0.1 – 0.2
8,3	–		eShop		H7	33	71	117	6	10	0.15	0.1 – 0.2
8,5	eShop		eShop		H7	33	71	117	6	10	0.15	0.1 – 0.2
8,7	–		eShop		H7	36	79	125	6	10	0.15	0.1 – 0.2
9	eShop		eShop		H7	36	79	125	6	10	0.15	0.1 – 0.2
9,5	eShop		eShop		H7	36	79	125	6	10	0.15	0.1 – 0.2
9,6	eShop		–		H7	36	79	125	6	10	0.15	0.1 – 0.2
9,97	eShop		eShop		H7	41	87	133	6	10	0.15	0.1 – 0.2
9,98	eShop		eShop		H7	41	87	133	6	10	0.15	0.1 – 0.2
9,99	eShop		eShop		H7	41	87	133	6	10	0.15	0.1 – 0.2
10	eShop		eShop		H7	41	87	133	6	10	0.18	0.1 – 0.2
10,01	eShop		eShop		H7	41	87	133	6	10	0.18	0.1 – 0.2
10,02	eShop		eShop		H7	41	87	133	6	10	0.18	0.1 – 0.2
10,03	eShop		eShop		H7	41	87	133	6	10	0.18	0.1 – 0.2
11	eShop		eShop		H7	41	91	142	6	12	0.18	0.1 – 0.2
11,97	eShop		eShop		H7	44	99	150	6	12	0.18	0.1 – 0.2
11,98	eShop		eShop		H7	44	99	150	6	12	0.18	0.1 – 0.2
11,99	eShop		eShop		H7	44	99	150	6	12	0.18	0.1 – 0.2
12	eShop		eShop		H7	44	99	150	6	12	0.18	0.1 – 0.2
12,01	eShop		eShop		H7	44	99	150	6	12	0.18	0.1 – 0.2
12,02	eShop		eShop		H7	44	99	150	6	12	0.18	0.1 – 0.2
12,03	eShop		eShop		H7	44	99	150	6	12	0.18	0.1 – 0.2
13	eShop		eShop		H7	44	99	150	8	14	0.18	0.2 – 0.3
14	eShop		eShop		H7	47	110	162	8	14	0.18	0.2 – 0.3
15	eShop		eShop		H7	50	110	162	8	16	0.18	0.2 – 0.3
16	eShop		eShop		H7	52	115	170	8	16	0.2	0.2 – 0.3
17	eShop		eShop		H7	54	120	175	8	18	0.2	0.2 – 0.3
18	eShop		eShop		H7	56	126	182	8	18	0.2	0.2 – 0.3
19	eShop		eShop		H7	58	131	189	8	20	0.2	0.2 – 0.3
20	eShop		eShop		H7	60	136	195	8	20	0.2	0.2 – 0.3





Garant Universal solid carbide machine reamers, non-standard sizes and fits

Version suitable for NC DIN 8093-2 with straight shank $\varnothing$ for standard chucking especially in **hydraulic chucks** or **high precision collet chucks**.

This ensures **very high concentricity** and **process reliability**,

The use of GARANT-NC reamers eliminates the need to procure special collets.

With long flutes and left-hand helix.

Reamers finish ground to match your specification.

Application: For reaming through holes, as the chips are evacuated in the cutting direction. Lead taper is suitable also for blind holes.

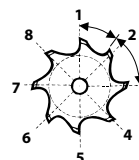
Note: For H7 fit see No. 164340 and 164341.



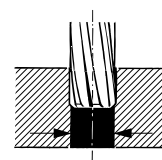
164345



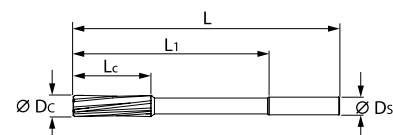
164344



Even number of teeth with irregular spacing – teeth are exactly opposite each other; e.g. teeth 1 and 5.



The correct undersize for pre-drilled holes can be found in the machining handbook.



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N						
164344		35	30	25	30	25	20	15	10				15	12	10	10	25						
164345		35	30		20	13	10	8	6				10	8	8	8	20						

Nominal Ø D _c	TON	16 4345	TON	16 4344	Ø range	L _c	L ₁	L	Number of cutting edges Z	Ø D _s		Reaming oversize in Ø reference value
	Solid carbide NC machine reamer											
	Configurable		TiAlN									
mm					mm	mm	mm	mm		mm	mm/rev.	mm
1		(eShop)		(eShop)	0.95 – 1.06	6	19	50	3	4	0.08	0.05 – 0.1
1,1		(eShop)		(eShop)	1.07 – 1.18	9	19	50	3	4	0.08	0.05 – 0.1
1,2		(eShop)		(eShop)	1.19 – 1.32	9	19	50	3	4	0.08	0.05 – 0.1
1,4		(eShop)		(eShop)	1.33 – 1.42	9	19	50	3	4	0.08	0.05 – 0.1
1,5		(eShop)		(eShop)	1.43 – 1.5	9	19	50	3	4	0.08	0.05 – 0.1
1,6		(eShop)		(eShop)	1.51 – 1.7	10	19	50	3	4	0.08	0.05 – 0.1
1,8		(eShop)		(eShop)	1.71 – 1.9	11	19	50	4	4	0.08	0.05 – 0.1
2		(eShop)		(eShop)	1.91 – 2.12	12	19	50	4	4	0.1	0.05 – 0.1
2,2		(eShop)		(eShop)	2.13 – 2.36	12	19	50	4	4	0.1	0.05 – 0.1
2,5		(eShop)		(eShop)	2.37 – 2.65	16	29	60	4	4	0.1	0.05 – 0.1
2,8		(eShop)		(eShop)	2.66 – 2.8	17	33	65	6	4	0.1	0.05 – 0.1
3		(eShop)		(eShop)	2.81 – 3	17	33	65	6	4	0.12	0.05 – 0.1
3,2		(eShop)		(eShop)	3.01 – 3.35	18	37	65	6	4	0.12	0.05 – 0.1
3,5		(eShop)		(eShop)	3.36 – 3.75	18	43	75	6	4	0.12	0.05 – 0.1
4		(eShop)		(eShop)	3.76 – 4.09	19	45	75	6	4	0.12	0.05 – 0.1
4,5		(eShop)		(eShop)	4.1 – 4.79	21	42	80	6	6	0.12	0.05 – 0.1
5		(eShop)		(eShop)	4.8 – 5.3	23	55	93	6	6	0.12	0.05 – 0.1
5,5		(eShop)		(eShop)	5.31 – 5.6	26	55	93	6	6	0.12	0.1 – 0.2
6		(eShop)		(eShop)	5.61 – 6.03	26	55	93	6	6	0.14	0.1 – 0.2
6,5		(eShop)		(eShop)	6.04 – 6.7	28	63	101	6	8	0.14	0.1 – 0.2
7		(eShop)		(eShop)	6.71 – 7.1	31	71	109	6	8	0.14	0.1 – 0.2
7,5		(eShop)		(eShop)	7.11 – 7.6	31	71	109	6	8	0.14	0.1 – 0.2
8		(eShop)		(eShop)	7.61 – 8.09	33	79	117	6	8	0.15	0.1 – 0.2
8,5		(eShop)		(eShop)	8.1 – 8.6	33	79	117	6	8	0.15	0.1 – 0.2
9		(eShop)		(eShop)	8.61 – 9.1	36	83	125	6	10	0.15	0.1 – 0.2
9,5		(eShop)		(eShop)	9.11 – 9.69	36	83	125	6	10	0.15	0.1 – 0.2
10		(eShop)		(eShop)	9.7 – 10.05	38	91	133	6	10	0.18	0.1 – 0.2
10,5		(eShop)		(eShop)	10.06 – 10.6	38	91	133	6	10	0.18	0.1 – 0.2
11		(eShop)		(eShop)	10.61 – 11.05	41	100	142	6	10	0.18	0.1 – 0.2
11,5		(eShop)		(eShop)	11.06 – 11.8	41	100	142	6	10	0.18	0.1 – 0.2
12		(eShop)		(eShop)	11.81 – 12.2	44	104	151	6	12	0.18	0.1 – 0.2
13		(eShop)		(eShop)	12.21 – 13.2	44	104	151	8	12	0.18	0.2 – 0.3
14		(eShop)		(eShop)	13.21 – 14	47	110	160	8	16	0.18	0.2 – 0.3
15		(eShop)		(eShop)	14.01 – 15.2	50	112	162	8	16	0.18	0.2 – 0.3
16		(eShop)		(eShop)	15.21 – 16.2	52	120	170	8	16	0.2	0.2 – 0.3
17		(eShop)		(eShop)	16.21 – 17.2	52	125	175	8	18	0.2	0.2 – 0.3
18		(eShop)		(eShop)	17.21 – 18.2	52	132	182	8	18	0.2	0.2 – 0.3
19		(eShop)		(eShop)	18.21 – 19.2	52	137	189	8	20	0.2	0.2 – 0.3
20		(eShop)		(eShop)	19.21 – 20.2	52	143	195	8	20	0.2	0.2 – 0.3

HSS



HPC

H7

Garant Through hole / blind hole HSS high-performance reamers, non-standard sizes and fits

Version suitable for NC with straight shank $\varnothing$ for the standardised toolholder, specially in **hydraulic chucks** or **high-accuracy chucks**.

This ensures **very high concentricity** and **process reliability**.

It is no longer necessary to procure special arbors.

With internal coolant feed for **HPC use** to reduce production costs.

With short, straight flutes.

Tolerance specifications:

Configurable: Reamers finish ground to match your specification.

H7: Version to DIN1420 for H7 bore tolerance.

Application:

16 4358 – For **HPC/HSC reaming of through holes**.

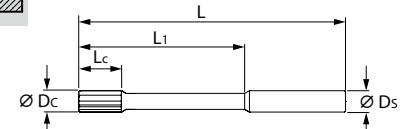
16 4359 – For **HPC/HSC reaming of blind holes**.



16 4358



16 4359



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si													INOX	INOX	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	H	H	H	M	M	K	K						
16 4358/4359					45	45	35	35										40	30	●		●	○		

Nominal $\varnothing D_c$	16 4358	16 4359	Tolerance	$\varnothing$ range	L_c	L_1	L	Number of cutting edges Z	$\varnothing D_s$	Reaming oversize in $\varnothing$ reference value
	HSS high-performance reamer									
	HPC through hole	HPC blind hole				16 4358	16 4359	16 4358	16 4359	
mm	TiAlN	TiAlN		mm	mm	mm	mm	mm	mm	mm
6	(eShop)	(eShop)	Configurable	6 – 6.7	16	58	39	100	6	0.12
6H7	eShop	eShop	H7	–	16	58	39	100	6	0.12
7	(eShop)	(eShop)	Configurable	6.71 – 7.2	16	58	42	100	6	0.12
7H7	eShop	eShop	H7	–	16	58	42	100	6	0.12
7.5	(eShop)	(eShop)	Configurable	7.21 – 7.7	16	59	44	100	6	0.12
8	(eShop)	(eShop)	Configurable	7.71 – 8.2	16	59	46	100	6	0.12
8H7	eShop	eShop	H7	–	16	59	46	100	6	0.12
8.5	(eShop)	(eShop)	Configurable	8.21 – 8.7	20	54	38	100	6	0.15
9	(eShop)	(eShop)	Configurable	8.71 – 9.2	20	54	40	100	6	0.15
9H7	eShop	eShop	H7	–	20	54	40	100	6	0.15
9.5	(eShop)	(eShop)	Configurable	9.21 – 9.7	20	75	60	120	6	0.15
10	(eShop)	(eShop)	Configurable	9.71 – 10.2	20	75	60	120	6	0.15
10H7	eShop	eShop	H7	–	20	75	60	120	6	0.15
10.5	(eShop)	(eShop)	Configurable	10.21 – 10.7	20	69	51	120	6	0.18
11	(eShop)	(eShop)	Configurable	10.71 – 11.2	20	69	52	120	6	0.18
11H7	eShop	eShop	H7	–	20	69	52	120	6	0.18
11.5	(eShop)	(eShop)	Configurable	11.21 – 11.7	20	70	53	120	6	0.18
12	(eShop)	(eShop)	Configurable	11.71 – 12.2	20	70	54	120	6	0.18
12H7	eShop	eShop	H7	–	20	70	54	120	6	0.18
13	(eShop)	(eShop)	Configurable	12.21 – 13.2	22	79	59	130	6	0.18
13H7	eShop	eShop	H7	–	22	79	59	130	6	0.18
14	(eShop)	(eShop)	Configurable	13.21 – 14.2	22	80	63	130	6	0.18
14H7	eShop	eShop	H7	–	22	80	63	130	6	0.18
15	(eShop)	(eShop)	Configurable	14.21 – 15.2	22	76	58	130	6	0.18
15H7	eShop	eShop	H7	–	22	76	58	130	6	0.18
16	(eShop)	(eShop)	Configurable	15.21 – 16.2	25	97	78	150	6	0.18
16H7	eShop	eShop	H7	–	25	97	78	150	6	0.18
17	(eShop)	(eShop)	Configurable	16.21 – 17.2	25	96	78	150	8	0.23
17H7	eShop	eShop	H7	–	25	96	78	150	8	0.23
18	(eShop)	(eShop)	Configurable	17.21 – 18.2	25	97	80	150	8	0.23
18H7	eShop	eShop	H7	–	25	97	80	150	8	0.23
19	(eShop)	(eShop)	Configurable	18.21 – 19.2	25	94	80	150	8	0.23
19H7	eShop	eShop	H7	–	25	94	80	150	8	0.23
20	(eShop)	(eShop)	Configurable	19.21 – 20.2	25	95	82	150	8	0.23
20H7	eShop	eShop	H7	–	25	95	82	150	8	0.23
21	(eShop)	(eShop)	Configurable	20.21 – 21.2	25	105	93	160	8	0.3
22	(eShop)	(eShop)	Configurable	21.21 – 22.2	25	105	95	160	8	0.3
23	(eShop)	(eShop)	Configurable	22.21 – 23.2	25	125	115	180	8	0.3
24	(eShop)	(eShop)	Configurable	23.21 – 24.2	25	125	115	180	8	0.3
25	(eShop)	(eShop)	Configurable	24.21 – 25.2	25	125	125	180	8	0.3
25H7	eShop	eShop	H7	–	25	125	125	180	8	0.3
26	(eShop)	(eShop)	Configurable	25.21 – 26.2	25	125	125	180	8	0.4
27	(eShop)	(eShop)	Configurable	26.21 – 27.2	25	125	125	180	8	0.4
28	(eShop)	(eShop)	Configurable	27.21 – 28.2	25	119	119	180	8	0.4
29	(eShop)	(eShop)	Configurable	28.21 – 29.2	25	119	119	180	8	0.4
30	(eShop)	(eShop)	Configurable	29.21 – 30.2	25	139	139	200	8	0.4
30H7	eShop	eShop	H7	–	25	139	139	200	8	0.4
31	(eShop)	(eShop)	Configurable	30.21 – 31.2	25	139	139	200	8	0.45
32	(eShop)	(eShop)	Configurable	31.21 – 32.2	25	139	139	200	8	0.45
32H7	eShop	eShop	H7	–	25	139	139	200	8	0.45
33	(eShop)	(eShop)	Configurable	32.21 – 33.2	25	139	139	200	8	0.45
34	(eShop)	(eShop)	Configurable	33.21 – 34.2	25	139	139	200	8	0.45
35	(eShop)	(eShop)	Configurable	34.21 – 35.2	25	139	139	200	8	0.45
36	(eShop)	(eShop)	Configurable	35.21 – 36.2	25	139	139	200	8	0.45
36H7	eShop	eShop	H7	–	25	139	139	200	8	0.45
37	(eShop)	(eShop)	Configurable	36.21 – 37.2	25	139	139	200	8	0.45
38	(eShop)	(eShop)	Configurable	37.21 – 38.2	25	139	139	200	8	0.45
39	(eShop)	(eShop)	Configurable	38.21 – 39.2	25	139	139	200	8	0.45
40	(eShop)	(eShop)	Configurable	39.21 – 40.2	25	139	139	200	8	0.45

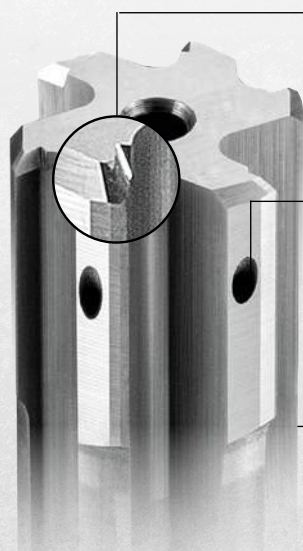
The GARANT Master families in high-performance reaming.

Increase efficiency and experience process reliability.

The comprehensive tool selection from the Hoffmann Group enables very high cutting performance – even in materials that are difficult to machine and hardened. The high-performance reamers GARANT Master Steel, GARANT Master Alu and GARANT Master Titan are setting new benchmarks in terms of performance and pricing. The respective variants for machining through holes and blind holes are available for optimum machining results.

Through hole (DL)

Blind hole (GL)



Effective lead chamfer.

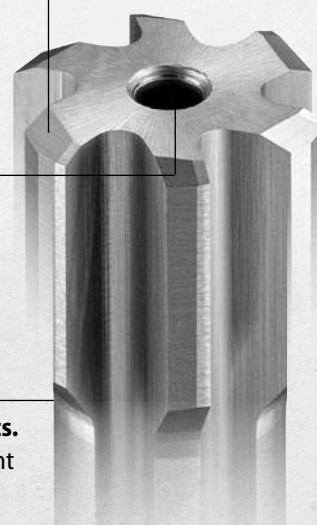
DL: Spiral point.
GL: 60° lead angle.

Special cooling strategy.

DL: Optimised due to radial coolant outlets.
GL: Central through-coolant.

Optimum smooth running characteristics.

Unequally spaced cutting edge arrangement and ground circular guides width.



Garant MASTER ALU

Our solution for aluminium.

Garant MASTER TITAN

The master for titanium and titanium alloys.

Garant MASTER STEEL

The universal solution for machining steel and stainless materials.

Through hole (DL)

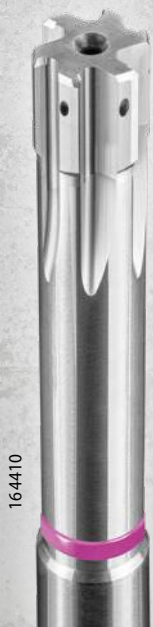
Blind hole (GL)



- Wear-resistant **DLC sp2 coating**.
– Ideal for aluminium.
- Further developed carbide substrate.

Through hole (DL)

Blind hole (GL)



- Wear-resistant **TiAlN coating**.
- Further developed carbide substrate.

Through hole (DL)

Blind hole (GL)

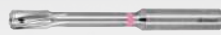


No longer in the portfolio.

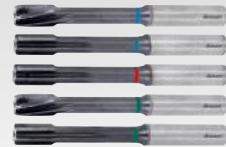


16 4346

16 4347



16 4352



16 4350/51

16 4348

16 4362/92

Current portfolio.



16 4400



16 4405



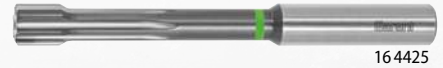
16 4410



16 4415



16 4420



16 4425

- Patented cooling strategy.
 - Innovative geometry.
 - Universal, configurable and delivered quickly.
 - Best price-performance ratio.
- = Master Performance in high-performance reaming.**

Impressive test results:

Test in 42CrMo4, $v_c = 180$ m/min, $f = 1.7$ mm/rev, machining depth = $3 \times D$

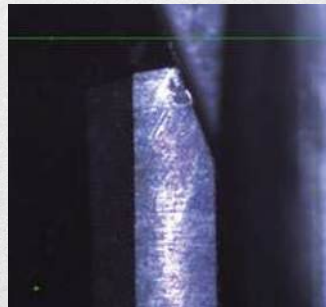
Competitor 1



Competitor 2



Garant MASTER STEEL



Garant MASTER STEEL



Competitors with aggressive pricing policy – after 84 through holes.

840 through holes.

840 blind holes.

Tool	Material	Cutting data	Reaming oversize in Ø (mm)	The result
164425 8H7	1.2379 / X155 CrVMo 12	$v_c = 150$ m/min $f = 1.4$ mm/rev	0.2	Tool life ends after 2000 fits.
164420/25 12H7	1.7131 case hardened to 60 HRC	$v_c = 10$ m/min $f = 0.12$ mm/rev	0.1	Tool life ends after 40 fits.
164420/25 10H7	1.7131 16 MnCr5	$v_c = 180$ m/min $f = 1.2$ mm/rev	0.2	Test ends at 400 fits.
164410/15 12	3.7164 / Ti6 AL4V	$v_c = 20-30$ m/min $f = 0.2-0.6$ mm/rev	0.1	Good R_a values of around $2\mu\text{m}$, very low wear in the μm range. Tool has an optimised geometry to prevent heat generation.
164400/05 12	3.3547 / AlMg 4.5 Mn 3.4365 / AlZn 5.5 MgCu	$v_c = 250$ m/min $f = 1.5-2.4$ mm/rev	0.2	R_a values of 1.3–1.7 with good chip formation and chip evacuation.

Hoffmann Group Tool Tip:

- Uncompromising machining of steel and stainless steel with the GARANT Master Steel high-performance reamer.
- When performing high-performance machining, pay attention to the tool run-out in the machine (not greater than $5\mu\text{m}$) in order to achieve attractive machining results.
- If necessary, reduce the retraction speed to avoid the formation of grooves on the wall of the hole.
- If necessary, you can adapt the cutting data to the capabilities of your machine.
- For convenient and quick removal of chip buildup on the reaming tool (e.g. in 1.7131 and 1.4301), please note our extensive range of hand tools!



Garant GARANT Master Alu solid carbide high-performance reamers for through / blind hole, non-standard sizes and fits

Special HPC reamers of the latest generation, for **machining aluminium**, with improved tooth geometry and further developed carbide substrate. Extra-short teeth for increased cutting performance values. Optimised cooling strategy with radially arranged coolant outlets aligned directly to the teeth.

Version suitable for NC with straight shank $\varnothing$ for standard arbors especially in **hydraulic chucks** or **high precision collet chucks**. Very high concentricity and process reliability due to unequal spacing of the teeth and special profile of the round chamfer width.

Version with DLC coating ta-C.

Tolerance specifications:

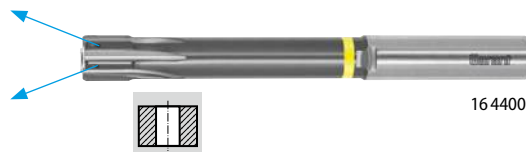
Configurable: Reamers finish ground to match your specification.

H7: Version to DIN1420 for H7 bore tolerance.

Application:

16 4400 – Special version for through holes.

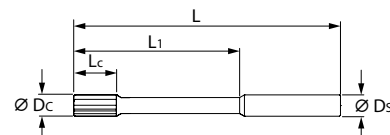
16 4405 – Special version for blind holes.



16 4400



16 4405



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
16 4400/4405		250	250	250																			

Nominal $\varnothing$ D_c	TOP 16 4400	TOP 16 4405	Tolerance	$\varnothing$ range	L_c	L_1	L	Number of cutting edges Z	$\varnothing D_s$	Alu cast > 10 % Si f	Reaming oversize in $\varnothing$ reference value
mm	HPC through hole DLC	HPC blind hole DLC		mm	mm	mm	mm		mm	mm/rev.	mm
4	(eShop)	(eShop)	configurable	3.701 – 4.2	8	39	75	4	6	0.6	0.1
4H7	(eShop)	(eShop)	H7	–	8	39	75	4	6	0.6	0.1
4,5	(eShop)	(eShop)	configurable	4.201 – 4.7	8	39	75	4	6	0.6	0.1
5	(eShop)	(eShop)	configurable	4.701 – 5.2	8	39	75	4	6	0.6	0.1
5H7	(eShop)	(eShop)	H7	–	8	39	75	4	6	0.6	0.1
5,5	(eShop)	(eShop)	configurable	5.201 – 5.7	8	39	75	4	6	0.6	0.1
6	(eShop)	(eShop)	configurable	5.701 – 6.2	8	39	75	6	6	1	0.1
6H7	(eShop)	(eShop)	H7	–	8	39	75	6	6	1	0.1
6,5	(eShop)	(eShop)	configurable	6.201 – 6.7	10	64	100	6	8	1	0.1
7	(eShop)	(eShop)	configurable	6.701 – 7.2	10	64	100	6	8	1	0.1
7,5	(eShop)	(eShop)	configurable	7.201 – 7.7	10	64	100	6	8	1	0.1
8	(eShop)	(eShop)	configurable	7.701 – 8.2	10	64	100	6	8	1.5	0.1
8H7	(eShop)	(eShop)	H7	–	10	64	100	6	8	1.5	0.1
8,5	(eShop)	(eShop)	configurable	8.201 – 8.7	10	60	100	6	10	1.5	0.1
9	(eShop)	(eShop)	configurable	8.701 – 9.2	10	60	100	6	10	1.5	0.1
9,5	(eShop)	(eShop)	configurable	9.201 – 9.7	12	80	120	6	10	1.5	0.1
10	(eShop)	(eShop)	configurable	9.701 – 10.2	12	80	120	6	10	1.8	0.1
10H7	(eShop)	(eShop)	H7	–	12	80	120	6	10	1.8	0.1
10,5	(eShop)	(eShop)	configurable	10.201 – 10.7	12	75	120	6	12	1.8	0.2
11	(eShop)	(eShop)	configurable	10.701 – 11.2	12	75	120	6	12	1.8	0.2
11,5	(eShop)	(eShop)	configurable	11.201 – 11.7	12	75	120	6	12	1.8	0.2
12	(eShop)	(eShop)	configurable	11.701 – 12.2	12	75	120	6	12	2.1	0.2
12H7	(eShop)	(eShop)	H7	–	12	75	120	6	12	2.1	0.2
13	(eShop)	(eShop)	configurable	12.201 – 13.2	15	85	130	6	14	2.1	0.2
14	(eShop)	(eShop)	configurable	13.201 – 14.2	15	85	130	6	14	2.1	0.2
15	(eShop)	(eShop)	configurable	14.201 – 15.2	15	82	130	6	16	2.1	0.2
15H7	(eShop)	(eShop)	H7	–	15	82	130	6	16	2.1	0.2
16	(eShop)	(eShop)	configurable	15.201 – 16.2	15	102	150	6	16	2.1	0.2
16H7	(eShop)	(eShop)	H7	–	15	102	150	6	16	2.1	0.2
17	(eShop)	(eShop)	configurable	16.201 – 17.2	15	102	150	6	18	2.4	0.2
18	(eShop)	(eShop)	configurable	17.201 – 18.2	15	102	150	6	18	2.4	0.2
19	(eShop)	(eShop)	configurable	18.201 – 19.2	15	100	150	6	20	2.4	0.2
20	(eShop)	(eShop)	configurable	19.201 – 20.2	15	100	150	6	20	2.4	0.2



Garant GARANT Master Titan solid carbide high-performance reamers for through / blind hole, non-standard sizes and fits

Special HPC reamers of the latest generation, for **machining titanium**, with improved tooth geometry and further developed carbide substrate. Extra-short cutting edge for increased cutting performance values. Optimised cooling strategy with radially arranged coolant outlets aligned directly to the teeth.

Version suitable for NC with straight shank dia. for standard arbors especially in **hydraulic chucks** or **high precision collet chucks**. Very high concentricity and process reliability thanks to unequal spacing of the teeth and special profile of the round chamfer width.

Tolerance specifications:

Configurable: Reamers finish ground to match your specification.

Application:

16 4410 – Special version for through holes.

16 4415 – Special version for blind holes.

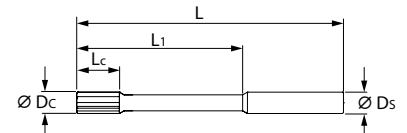
Note: Delivery time: 4 weeks.



16 4410



16 4415



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
16 4410/4415																30							

Nominal Ø D _c	TOP 16 4410	TOP 16 4415	Tolerance	Ø range	L _c	L ₁	L	Number of cutting edges Z	Ø D _s	Ti > 850 N f	Reaming oversize in Ø reference value
	GARANT Master Titan solid carbide high-performance reamer										
mm	HPC through hole TiAlN	HPC blind hole TiAlN		mm	mm	mm	mm		mm	mm/rev.	mm
4	(eShop)	(eShop)	Configurable	3.701 – 4.2	8	39	75	4	6	0.24	0.1
4,5	(eShop)	(eShop)	Configurable	4.201 – 4.7	8	39	75	4	6	0.24	0.1
5	(eShop)	(eShop)	Configurable	4.701 – 5.2	8	39	75	4	6	0.24	0.1
5,5	(eShop)	(eShop)	Configurable	5.201 – 5.7	8	39	75	4	6	0.28	0.1
6	(eShop)	(eShop)	Configurable	5.701 – 6.2	8	39	75	6	6	0.36	0.1
6,5	(eShop)	(eShop)	Configurable	6.201 – 6.7	10	64	100	6	8	0.36	0.1
7	(eShop)	(eShop)	Configurable	6.701 – 7.2	10	64	100	6	8	0.36	0.1
7,5	(eShop)	(eShop)	Configurable	7.201 – 7.7	10	64	100	6	8	0.36	0.1
8	(eShop)	(eShop)	Configurable	7.701 – 8.2	10	64	100	6	8	0.36	0.1
8,5	(eShop)	(eShop)	Configurable	8.201 – 8.7	10	60	100	6	10	0.42	0.1
9	(eShop)	(eShop)	Configurable	8.701 – 9.2	10	60	100	6	10	0.42	0.1
9,5	(eShop)	(eShop)	Configurable	9.201 – 9.7	12	80	120	6	10	0.42	0.1
10	(eShop)	(eShop)	Configurable	9.701 – 10.2	12	80	120	6	10	0.42	0.1
10,5	(eShop)	(eShop)	Configurable	10.201 – 10.7	12	75	120	6	12	0.42	0.1
11	(eShop)	(eShop)	Configurable	10.701 – 11.2	12	75	120	6	12	0.42	0.1
11,5	(eShop)	(eShop)	Configurable	11.201 – 11.7	12	75	120	6	12	0.42	0.1
12	(eShop)	(eShop)	Configurable	11.701 – 12.2	12	75	120	6	12	0.48	0.1
13	(eShop)	(eShop)	Configurable	12.201 – 13.2	15	85	130	6	14	0.48	0.1
14	(eShop)	(eShop)	Configurable	13.201 – 14.2	15	85	130	6	14	0.48	0.1
15	(eShop)	(eShop)	Configurable	14.201 – 15.2	15	82	130	6	16	0.48	0.2
16	(eShop)	(eShop)	Configurable	15.201 – 16.2	15	102	150	6	16	0.48	0.2
17	(eShop)	(eShop)	Configurable	16.201 – 17.2	15	102	150	6	18	0.48	0.2
18	(eShop)	(eShop)	Configurable	17.201 – 18.2	15	102	150	6	18	0.6	0.2
19	(eShop)	(eShop)	Configurable	18.201 – 19.2	15	100	150	6	20	0.6	0.2
20	(eShop)	(eShop)	Configurable	19.201 – 20.2	15	100	150	6	20	0.6	0.2



GARANT Master Steel solid carbide high-performance reamers for through / blind hole, non-standard sizes and fits

The latest generation of **universal** HPC reamers. Extra-short teeth for increased cutting performance values. Optimised cooling strategy with radially arranged coolant outlets aligned directly to the teeth.

For uncompromising applications in steel and stainless steel. Reliable machining of high-tensile steels up to 60 HRC. Version suitable for NC with straight shank Ø for standard arbors especially in **hydraulic chucks** or **high precision collet chucks**.

Very high concentricity and process reliability due to unequal spacing.

Tolerance specifications:

Configurable: Reamers finish ground to match your specification.

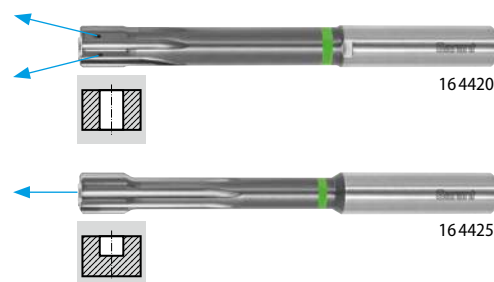
H7: Version for H7 bore tolerance.

0/0.005 mm: Manufacturing or cutting tolerance of nominal Ø D_c

Application:

16 4420 – Special version for through holes.

16 4425 – Special version for blind holes.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	K						
16 4420/4425				180	180	180	150	100	100	12	8			50	30	110	90						

Nominal Ø D _c	TOP 16 4420	TOP 16 4425	Tolerance	Ø range	L _c	L ₁	L	Number of cutting edges Z	Ø D _s		INOX < 900 N f	Reaming oversize in Ø reference value
mm	TiAlN	TiAlN		mm	mm	mm	mm		mm	mm/rev.	mm/rev.	mm
4	(eShop)	(eShop)	Configurable	3.701 – 4.2	8	39	75	4	6	0.6	0.2	0.1
4H7	eShop	eShop	H7	–	8	39	75	4	6	0.6	0.2	0.1
4.01	eShop	–	0 / 0.005	–	8	39	75	4	6	0.6	0.2	0.1
4.02	eShop	–	0 / 0.005	–	8	39	75	4	6	0.6	0.2	0.1
4.03	eShop	–	0 / 0.005	–	8	39	75	4	6	0.6	0.2	0.1
4.5	(eShop)	(eShop)	Configurable	4.201 – 4.7	8	39	75	4	6	0.6	0.2	0.1
4.97	eShop	–	0 / 0.005	–	8	39	75	4	6	0.6	0.2	0.1
4.98	eShop	–	0 / 0.005	–	8	39	75	4	6	0.6	0.2	0.1
4.99	eShop	–	0 / 0.005	–	8	39	75	4	6	0.6	0.2	0.1
5	(eShop)	(eShop)	Configurable	4.701 – 5.2	8	39	75	4	6	0.6	0.2	0.1
5H7	eShop	eShop	H7	–	8	39	75	4	6	0.6	0.2	0.1
5.02	eShop	–	0 / 0.005	–	8	39	75	4	6	0.6	0.2	0.1
5.5	(eShop)	(eShop)	Configurable	5.201 – 5.7	8	39	75	4	6	0.6	0.2	0.1
5.97	eShop	–	0 / 0.005	–	8	39	75	6	6	1	0.3	0.1
5.99	eShop	–	0 / 0.005	–	8	39	75	6	6	1	0.3	0.1
6	(eShop)	(eShop)	Configurable	5.701 – 6.2	8	39	75	6	6	1	0.3	0.1
6H7	eShop	eShop	H7	–	8	39	75	6	6	1	0.3	0.1
6.01	eShop	–	0 / 0.005	–	8	39	75	6	6	1	0.3	0.1
6.02	eShop	–	0 / 0.005	–	8	39	75	6	6	1	0.3	0.1
6.03	eShop	–	0 / 0.005	–	8	39	75	6	6	1	0.3	0.1
6.5	(eShop)	(eShop)	Configurable	6.201 – 6.7	10	64	100	6	8	1	0.3	0.1
7	(eShop)	(eShop)	Configurable	6.701 – 7.2	10	64	100	6	8	1	0.3	0.1
7.5	(eShop)	(eShop)	Configurable	7.201 – 7.7	10	64	100	6	8	1	0.3	0.1
7.99	eShop	–	0 / 0.005	–	10	64	100	6	8	1.2	0.3	0.1
8	(eShop)	(eShop)	Configurable	7.701 – 8.2	10	64	100	6	8	1.2	0.3	0.1
8H7	eShop	eShop	H7	–	10	64	100	6	8	1.2	0.3	0.1
8.01	eShop	–	0 / 0.005	–	10	64	100	6	8	1.2	0.3	0.1
8.02	eShop	–	0 / 0.005	–	10	64	100	6	8	1.2	0.3	0.1
8.03	eShop	–	0 / 0.005	–	10	64	100	6	8	1.2	0.3	0.1
8.5	(eShop)	(eShop)	Configurable	8.201 – 8.7	10	60	100	6	10	1.2	0.3	0.1
9	(eShop)	(eShop)	Configurable	8.701 – 9.2	10	60	100	6	10	1.2	0.3	0.1
9.5	(eShop)	(eShop)	Configurable	9.201 – 9.7	12	80	120	6	10	1.2	0.3	0.1
9.97	eShop	–	0 / 0.005	–	12	80	120	6	10	1.4	0.4	0.1
9.98	eShop	–	0 / 0.005	–	12	80	120	6	10	1.4	0.4	0.1
9.99	eShop	–	0 / 0.005	–	12	80	120	6	10	1.4	0.4	0.1
10	(eShop)	(eShop)	Configurable	9.701 – 10.2	12	80	120	6	10	1.4	0.4	0.1
10H7	eShop	eShop	H7	–	12	80	120	6	10	1.4	0.4	0.1
10.01	eShop	–	0 / 0.005	–	12	80	120	6	10	1.4	0.4	0.1
10.02	eShop	–	0 / 0.005	–	12	80	120	6	10	1.4	0.4	0.1
10.03	eShop	–	0 / 0.005	–	12	80	120	6	10	1.4	0.4	0.1
10.5	(eShop)	(eShop)	Configurable	10.201 – 10.7	12	75	120	6	12	1.4	0.4	0.2
11	(eShop)	(eShop)	Configurable	10.701 – 11.2	12	75	120	6	12	1.4	0.4	0.2
11.5	(eShop)	(eShop)	Configurable	11.201 – 11.7	12	75	120	6	12	1.4	0.4	0.2
11.98	eShop	–	0 / 0.005	–	12	75	120	6	12	1.4	0.5	0.2
12	(eShop)	(eShop)	Configurable	11.701 – 12.2	12	75	120	6	12	1.7	0.5	0.2
12H7	eShop	eShop	H7	–	12	75	120	6	12	1.7	0.5	0.2
12.01	eShop	–	0 / 0.005	–	12	75	120	6	12	1.7	0.5	0.2
12.02	eShop	–	0 / 0.005	–	12	75	120	6	12	1.7	0.5	0.2
13	(eShop)	(eShop)	Configurable	12.201 – 13.2	15	85	130	6	14	1.7	0.5	0.2
14	(eShop)	(eShop)	Configurable	13.201 – 14.2	15	85	130	6	14	1.7	0.5	0.2
15	(eShop)	(eShop)	Configurable	14.201 – 15.2	15	82	130	6	16	1.7	0.5	0.2
15H7	eShop	eShop	H7	–	15	82	130	6	16	1.7	0.5	0.2
16	(eShop)	(eShop)	Configurable	15.201 – 16.2	15	102	150	6	16	1.7	0.5	0.2
16H7	eShop	eShop	H7	–	15	102	150	6	16	1.7	0.5	0.2
17	(eShop)	(eShop)	Configurable	16.201 – 17.2	15	102	150	6	18	2	0.6	0.2
18	(eShop)	(eShop)	Configurable	17.201 – 18.2	15	102	150	6	18	2	0.6	0.2
19	(eShop)	(eShop)	Configurable	18.201 – 19.2	15	100	150	6	20	2	0.6	0.2
20	(eShop)	(eShop)	Configurable	19.201 – 20.2	15	100	150	6	20	2	0.6	0.2



H7

HPC



Remaining stock available via e-shop – only while stocks last.
Solid carbide reaming heads for steel (blind hole No. 23 9725) and INOX
(through hole No. 23 9730, blind hole No. 23 9735).

Garant TopCut REAM reaming heads

Interchangeable head reamer system **finish ground for fit IT7.**

Cutter geometry matched to the application.

System concentricity $\leq 5 \mu\text{m}$ (depending on the head and holder) when mounted.

23 9715 – With short, straight flutes.

23 9710/9720 – With short flutes and left-hand helix.

Application: For HPC/HSC reaming.

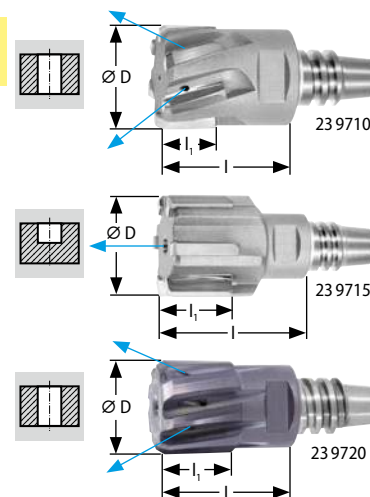
23 9715 – **For blind holes.**

23 9710/9720 – **For through holes.**

Note: **Total usable length** = L₁ (arbor No. 239740 / 239745) + l (interchangeable head No. 239710 to 239720).

Suitable assembly wrench No. 219987. Insert for torque wrench No. 219986.

Further sizes available on request.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si										INOX	INOX	Ti	GG	GGG					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	K					
23 9710/9715				140	140	140	120	120								160	140	●	●			
23 9720					120	120	120	120								80	60		●	●		

Nominal Ø D	23A	23A	23A	Arbor size		I ₁		I	Z		 f	
	Cermet reaming head HPC H7 steel		Solid carbide reaming head HPC H7 steel	23 9710 23 9720	23 9715	23 9710 23 9715	23 9720		23 9710 23 9715	23 9720	23 9710 23 9715 mm/rev.	23 9720 mm/rev.
	Through hole	Blind hole	Through hole TiAlN									
mm				mm	mm	mm	mm	mm				
10	eShop	—	eShop	10	—	8	10	18	6	6	0.36	0.6
11	eShop	—	(eShop)	10	—	8	10	20	6	6	0.36	0.6
12	eShop	—	eShop	10	—	8	10	20	6	6	0.36	0.6
13	eShop	—	eShop	12	—	8	10	22	6	6	0.36	0.7
14	eShop	—	eShop	12	—	8	12	22	6	6	0.36	0.7
15	eShop	eShop	eShop	12	10	8	12	22	6	6	0.6	0.8
16	eShop	eShop	eShop	12	10	8	12	22	6	6	0.6	0.8
17	eShop	eShop	eShop	12	12	8	12	22	6	8	0.6	1.1
18	eShop	eShop	eShop	16	12	12	14	26	6	8	0.6	1.1
19	eShop	eShop	eShop	16	12	12	14	26	6	8	0.6	1.1
20	eShop	eShop	eShop	16	12	12	14	26	6	8	0.6	1.1
21	eShop	eShop	eShop	16	12	12	14	26	6	8	0.6	1.2
22	eShop	eShop	eShop	20	16	12	14	26	6	8	0.6	1.2
23	eShop	eShop	eShop	20	16	12	14	26	6	8	0.6	1.2
24	eShop	eShop	eShop	20	16	12	14	26	6	8	0.6	1.4
25	eShop	eShop	eShop	20	16	12	14	26	6	8	0.6	1.4
26	eShop	eShop	eShop	20	20	12	14	26	6	8	0.6	1.4
28	eShop	eShop	—	24	20	12	—	26	6	—	0.6	—
30	eShop	eShop	—	24	20	12	—	26	8	—	0.8	—
32	eShop	eShop	—	24	24	12	—	30	8	—	0.8	—
34	eShop	eShop	—	29	24	12	—	30	8	—	0.8	—
36	eShop	eShop	—	29	24	12	—	30	8	—	0.8	—
38	eShop	eShop	—	29	24	12	—	30	8	—	0.8	—
40	eShop	eShop	—	29	24	12	—	30	8	—	0.8	—
42	eShop	eShop	—	29	29	12	—	30	8	—	0.8	—
44	eShop	eShop	—	29	29	12	—	30	8	—	0.8	—
46	eShop	eShop	—	29	29	12	—	30	8	—	0.8	—
48	eShop	eShop	—	29	29	12	—	30	8	—	0.8	—
50	eShop	eShop	—	29	29	12	—	30	8	—	0.8	—

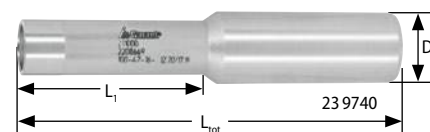


h6 DIN 6535 HA

Garant TopCut REAM reaming head arbors

Version suitable for NC with straight shank Ø for standard arbors especially in **hydraulic chucks** or **high precision collet chucks** for very high accuracy and process reliability.

Note: Observe the mounting size of the holder and reaming heads.
For further arbors see No. 210550 – 210582 and No. 212000.



Type	23A	23 9740	23A	23 9745	suitable for through hole Ø	suitable for blind hole Ø	L		L ₁		Ø D _s h ₆	recommended tightening torque
	Arbor 90°, cylindrical with IC						23 9740	23 9745	23 9740	23 9745		
	short		long									
					mm	mm	mm	mm	mm	mm	Nm	
10		eShop		eShop	10 – 12.7	14 – 16.2	90	120	35	65	16	5
12		eShop		eShop	12.71 – 17.2	16.21 – 21.2	100	140	47	87	16	10
16		eShop		eShop	17.21 – 21.2	21.21 – 25.2	108	160	65	105	20	15
20		eShop		eShop	21.21 – 26.2	25.21 – 30.2	140	200	78	138	25	20
24		eShop		eShop	26.21 – 32.2	30.21 – 40.2	142	202	84	144	25	25
29		eShop		eShop	32.21 – 50	40.21 – 50	146	216	82.5	152.5	32	35



New products – Thread machining

NEW

We use this symbol to tag new items
in our range of catalogue products

Garant VAP TAP



Page 280 / 283 / 288 / 293 / 310 / 313 / 317 / 323

GARANT Vap Tap – universal taps for a wide range of materials.
Surface vaporized M / M-LH / MF / G for blind and through holes

Garant VAP TAP



Page 365 / 366

GARANT Vap Tap – Machine tap sets with and without core drill.
M for blind and through holes; M3-12

HOLEX Pro Form



Page 332 / 333 / 336 / 337

HOLEX Pro Form machine taps –
powerful taps for use in a wide range of materials.
Models with and without oil grooves M / MF / G

Garant MASTER TM

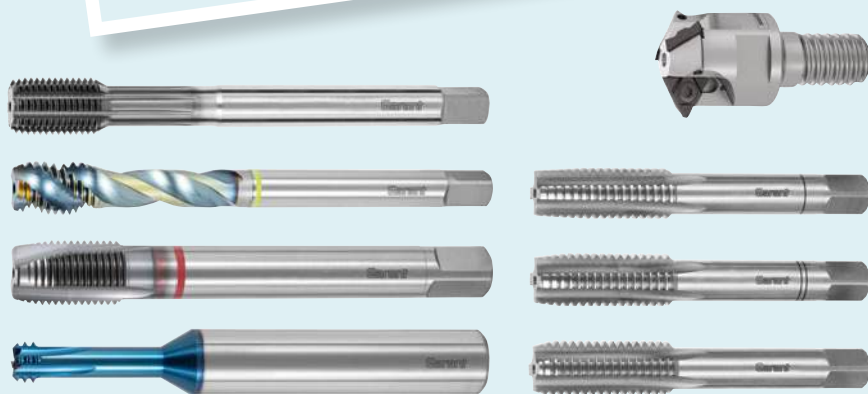


Pages 341 – 343

GARANT Master TM single and three-profile thread mills.
Newly developed universal geometry and high-performance coating for use in a wide range of applications.
M / M-LH / UN / UN-LH / MF / MF-LH / EG-M / EG-M-LH / G / G-LH / EG-G / EG-G-LH

Machining – Threads

Machining/clamping technology
for optimal processes.
Now sorted by application
drilling, tapping, milling, turning and clamping.



Garant
HOLEX

Taps,
fluteless taps,
thread milling cutters
Overview
pages 250 – 255

13

250 –
356



Garant
HOLEX

Dies,
thread cutting tool
sets,
holders,
holder set

14

357 –
369



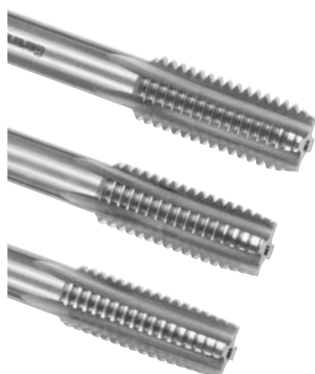
Further thread-cutting tools
in the chapter Turning, pages 831 – 855



Which tap is suitable for your application?

Discover at a glance which tap is suitable for your application.

Whether you are tapping by hand, or a single pillar drilling machine or on your modern machining centre, the range of taps from the Hoffmann Group will always offer you the right tool.



Hand tap

For tapping or cleaning existing threads by hand.

Set of three, consisting of taper, second and plug tap, or set of two, consisting of taper and plug tap.

Mounting in an adjustable **tap wrench** or **toolholder**.



Conventional

For use on conventional machines such as drilling machines, lathes and milling machines. A high degree of self-guidance and a distinct guide thread section are the features of these tools, which permit their use under unstable machine conditions.

Mounting in the **axial tapping head** or **tapping chuck with compensation**.



Dynamic

Cost-effective machining for highly demanding work.

High-performance tool materials and modern coatings permit long tool lives and a high degree of process reliability. Particularly suitable for CNC machines.

Mounting in the **tapping chuck with length compensation** or **minimum length compensation (MLA)**.



Synchronous

Very high performance, for use on machines with synchronised spindles.

Reduced self-guiding and a high-performance tool material coating combination permit extremely high cutting speeds combined with very long tool life.

Mounting in the **tapping chuck with minimum length compensation** or **rigid clamping**.

Hand tap sets

		Hand tap sets							
Colour ring									
Application									
Tool material		HSS		HSS-E		HSS-E		HSS	
Coating						nitrided		vaporised	
		Product number	Page	Product number	Page	Product number	Page	Product number	Page
M	ISO2/6H(X)	13 0150	258	13 0400	259	13 0450	259	13 0992	264
	ISO3/6G(X)								
M-LH	ISO2/6H	13 0460	260						
MF	ISO2/6H(X)	13 0470	261						
MF-LH	ISO2/6H								
G	DIN228	13 0550	261						
BSW	BS84	13 0670	262						
UNC	2B	13 0700	262						
UNF	2B	13 0750	263						
NPT	ANSI B1 20.1								
Rc	EN 10226								
Tr	7H	13 0760	263						
Pg	DIN40432								
EC-...	6H mod								
Application									
Tool material									
Coating									
M	ISO2/6H(X)								
M	ISO3/6G(X)								
M-LH	ISO2/6H								
MF	ISO2/6H(X)								
MF-LH	ISO2/6H								
G	DIN228								
G	Oversize								
BSW	BS84								
UNC	2B								
UNF	2B								
NPT	ANSI B1 20.1								
Tr	7H								
Pg	DIN40432								
EC-...	6H mod								

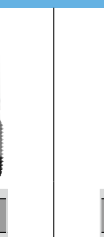
ISO 513

Aluminium, plastics	N	○	○	○	●
Steel < 500 N/mm ²	P	●			○
Steel < 900 N/mm ²	P	●	●		
Steel < 1400 N/mm ²	P		○	●	
Steel > 45 HRC	H				
INOX	M		●		○
Ti	S		●		
GG (G)	O	○	○	○	○
CuZn	N	○			○
Graphite, GRP, CRP	N				
UNI		●	●		

The areas of application are starting points for pre-selection,



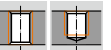
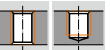
Conventional								Dynamic																	
																									
																									
HSS-E		HSS-E / PM		HSS / HSS-E		HSS-E / -PM				Carbide		HSS-E-PM		HSS-E-PM											
Product number	Page	Product number	Page	Product number	Page	TIN		Product number	Page	Product number	Page	DLC		DLC											
						Product number	Page					Product number	Page												
13 1450	269	13 1150	267	13 1760 13 1800	267 270	13 1250	267	13 1140	266	13 1110	265	13 1115	265												
		13 1200	267																						
		13 1280	268																						
		13 1290	268																						
		13 1650	269																						
		13 1700	270																						
		13 1850	271																						
		13 1300	268																						
		13 1350	268																						
		13 2830	285			13 2835	285			13 2810	284														
		13 3350	295			13 3260	291																		
		13 3400	297																						
13 8120	330																								
		13 3450	298							13 3555	299														
																									
																									
HSS-E		HSS-E / PM		HSS-E				HSS-E				HSS-E-PM		HSS-E-PM											
Product number	Page	Product number	Page	Product number	Page			Product number	Page			DLC		DLC											
												Product number	Page	Product number	Page										
13 4650	304	13 4600	303	13 4660	303			13 4200	300			13 4260	301	13 4265	301										
		13 4620	303																						
		13 6250	315									13 6230	314												
												13 7310	320												
		13 7860	325																						
		13 8000	327																						
												13 8205	331												

		Dynamic															
Colour ring																	
Application																	
Tool material		HSS-E		HSS-E-PM		Solid carbide		HSS-E-PM		HSS-E		HSS-E		HSS-E-PM		HSS-E-PM	
Coating				TiCN		TiAlN		TiCN		vaporised		TiAlN		TiAlN		TiAlN	
		Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page
M	ISO2/6H (X)	13 1900 13 1950	271 272	13 2055	274	13 2080	275	13 1940	273	13 2150 13 2155	275 275			13 2180 13 2190	276 276	13 2195	276
	ISO2/6H + 0.1 ISO3/6G (X) 7GX							13 1946	273					13 2193	276		
	M-LH MF	ISO2/6H ISO2/6H (X) ISO3/6G(X)															
	MF-LH G	ISO2/6H DIN228															
BSW	BS84																
UNC	2B													13 3356	295		
UNF	2B													13 3406	297		
NPT	ANSI B1 20.1																
Rc	EN 10226											13 8110	329				
Tr	7H																
Pg	DIN40432																
EC-...	6H mod																
Application																	
Tool material				HSS-E-PM				HSS-E-PM		HSS-E				HSS-E-PM		HSS-E-PM	
Coating				TiAlN				TiAlN		vaporised				TiAlN		TiAlN	
		Product number	Page	Product number	Page			Product number	Page	Product number	Page			Product number	Page	Product number	Page
M	ISO2/6H (X)							13 5371	305	13 5450 13 5550 13 5650	307 307 307			13 5732 13 5734 13 5736	308 308 308	13 5739	308
	ISO2/6H + 0.1 ISO3/6G (X) 7GX							13 5374	305	13 5600	307			13 5737	308		
	M-LH MF	ISO2/6H ISO2/6H (X) ISO3/6G(X)						13 6350	316	13 7050	317			13 7053	317		
	MF-LH G	ISO2/6H DIN228															
G	Oversize																
BSW	BS84																
UNC	2B													13 7857	326		
UNF	2B													13 8007	327		
NPT	ANSI B1 20.1			13 8100	329												
Tr	7H																
Pg	DIN40432																
EC-...	6H mod																
ISO 513																	
Aluminium, plastics	N									○		○		○		○	
Steel < 500 N/mm²	P									●		●		○		○	
Steel < 900 N/mm²	P	○						●		○		●		○		○	
Steel < 1400 N/mm²	P	●		●				●									
Steel > 45 HRC	H	○		●		●		○									
INOX	M							●		●		○		●		●	
Ti	S							○									
GG (G)	O											○					
CuZn	N																
Graphite, GRP, CRP	N									○		○		○		○	
UNI														●		●	

[illegible]

Synchronous tap									
Colour ring									
									
Application									
Tool material		HSS-E-PM		HSS-E-PM		HSS-E-PM		HSS-E-PM	
Coating		DLC		TiAlN		TiAlN		TiAlN	
		Product number	Page	Product number	Page	Product number	Page	Product number	Page
M	ISO2/6H	13 1125	266	13 2065	274	13 2280	277	13 2741	283
	ISO3/6G								
M-LH	ISO2/6H								
MF	ISO2/6H							13 2950	290
MF-LH	ISO2/6H								
G	DIN228								
BSW	BS84								
UNC	2B								
UNF	2B								
NPT	ANSI B1 20.1								
Rc	EN 10226								
Tr	7H							13 3490	299
Pg	DIN40432								
EC-...	6H mod								
									
Application									
Tool material		HSS-E-PM		HSS-E-PM		HSS-E-PM		HSS-E-PM	
Coating		DLC		TiAlN		TiAlN		TiAlN	
		Product number	Page	Product number	Page	Product number	Page	Product number	Page
M	ISO2/6H	13 4275	302	13 5410	306	13 5740	309	13 6171	313
		13 4280	302	13 5415	306	13 5743	309	13 6173	313
		13 4285	302	13 5420	306	13 5746	309	13 6176	313
	ISO3/6G								
M-LH	ISO2/6H								
MF	ISO2/6H							13 7180	319
								13 7183	319
								13 7186	319
MF-LH	ISO2/6H								
G	DIN228	13 7344	320					13 7810	325
		13 7345	320					13 7813	325
		13 7346	320					13 7816	325
BSW	BS84								
UNC	2B								
UNF	2B								
NPT	ANSI B1 20.1								
Rc	EN 10226								
Tr	7H								
Pg	DIN40432								
EC-...	6H mod								
ISO 513									
Aluminium, plastics	N	●				○		○	
Steel < 500 N/mm ²	P			●		●		●	
Steel < 900 N/mm ²	P			●		●		●	
Steel < 1400 N/mm ²	P			●				●	
Steel > 45 HRC	H			●					
INOX	M					●		●	
Ti	S								
GG (G)	O							●	
CuZn	N	●				○		●	
Graphite, GRP, CRP	N	○							
UNI								●	

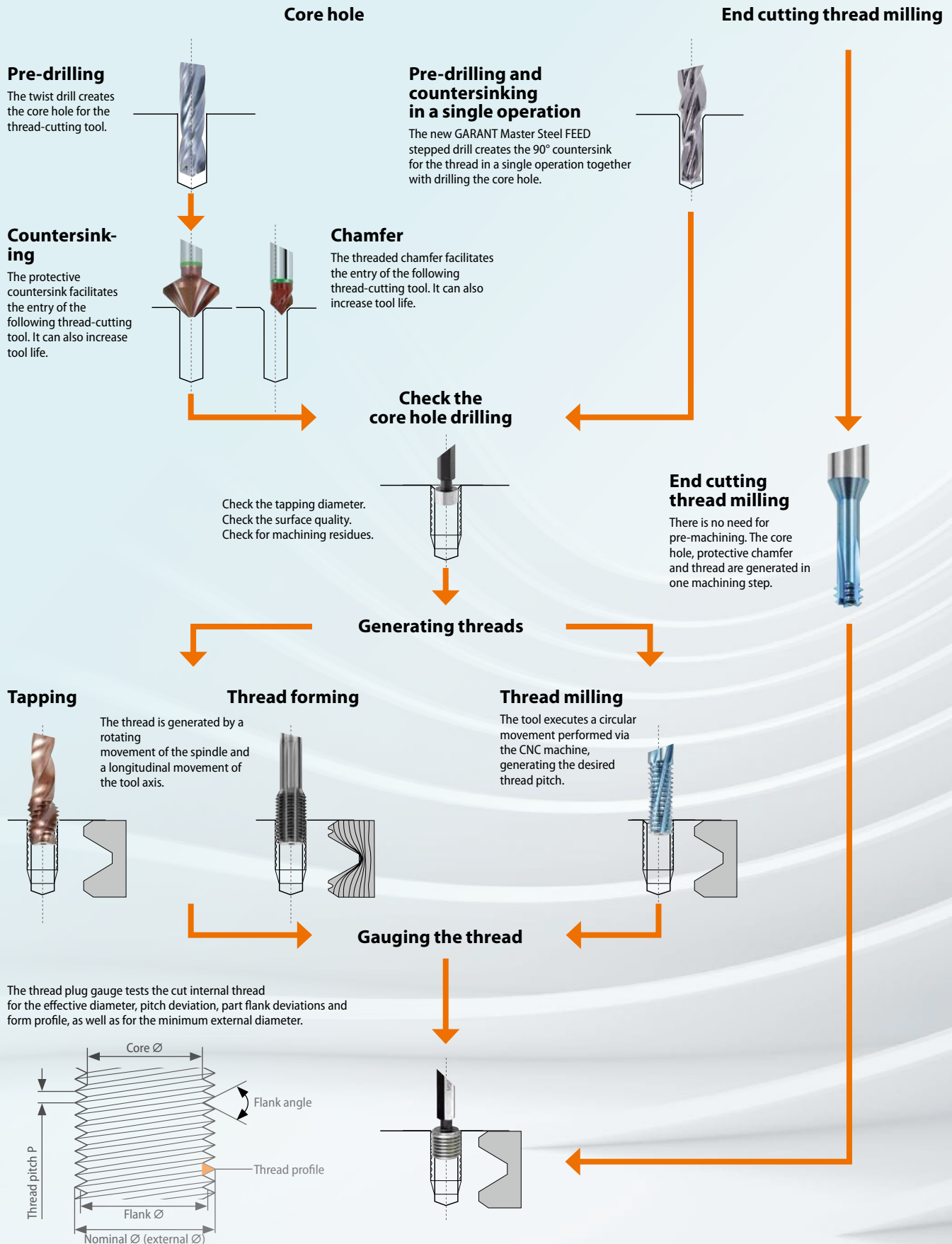
		Fluteless tap						Synchronous fluteless taps							
Colour ring															
Application															
Tool material		HSS-E-PM		HSS-E-PM		HSS-E-PM		HSS-E-PM		HSS-E-PM		Solid carbide		HSS-E-PM	
Coating		TiAlN		TiN		TiN		TiAlN		TiAlN		TiAlN		TiN	
		Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page
M	ISO2/6H	13 9171	333	13 9115 13 9175	332 333	13 9125	332	13 9194 13 9198 13 9202	334 334 334	13 9208	334	13 4242 13 9243 13 9244	335 335 335	13 9210 13 9215 13 9230	335 335 335
	ISO3/6GX 7GX					13 9135	332	13 9205 13 9207	334 334						
	M-LH	ISO2/6H						13 9255	336						
MF	ISO2/6H			13 9260	336			13 9280 13 9290	336 336						
G	DIN228	13 9395	337	13 9400	337			13 9415 13 9425	337 337						
UNC	2BX							13 9485	338						
UNF	2BX							13 9495	338						
ISO 513															
Aluminium, plastics	N	●				○						●		●	
Steel < 500 N/mm²	P	●		●		●		●		●		●		●	
Steel < 900 N/mm²	P			●		●		●		●		●		●	
Steel < 1400 N/mm²	P					○		●		●		●		○	
Steel > 45 HRC	H														
INOX	M			●		○		○		○				○	
Ti	S														
GG (G)	O														
CuZn	N			○		○		○		○				○	
Graphite, GRP, CRP	N														
UNI						●								●	

	Drill thread milling cutter		End cutting thread mill		End cutting thread mill		Single-profile thread mill		Three-profile thread mill		Thread mill		Thread mill with countersinking step	
Colour ring														
														
Application														
Tool material	Solid carbide		Solid carbide		Solid carbide		Solid carbide		Solid carbide		Solid carbide		Solid carbide	
Coating	TiAlN		TiAlN		AlCrN		AlTiN		AlTiN		AlTiN		AlTiN	
	Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page	Product number	Page
M / M-LH	13 9511 13 9516	339 339	13 9524	340	13 9526	339	13 9620 13 9625	341 342	13 9630	343	13 9642 13 9643	344 344	13 9666 13 9663 13 9664	345 345 345
MF / MF-LH											13 9675	346	13 9686 13 9687	347 347
G / G-LH			13 9527	340					13 9631	343	13 9706	348	13 9716	349
UNC / UNC-LH											13 9732	349	13 9733	350
UNF / UNF-LH											13 9737	350	13 9738	351
NPT											13 9739	351		
ISO 513														
Aluminium, plastics	N	●			●		●		●		●		●	
Steel < 500 N/mm²	P	●			●		●		●		●		●	
Steel < 900 N/mm²	P				●		●		●		●		●	
Steel < 1400 N/mm²	P		●		●		●		●		●		●	
Steel > 45 HRC	H		●		○		○		○		○		○	
INOX	M		●		●		●		●		●		●	
Ti	S		●		●		●		●		●		●	
GG (G)	O	○			●		●		●		●		●	
CuZn	N	●			●		●		●		●		●	
Graphite, GRP, CRP	N													
UNI					●		●		●		●		●	

Thread generation to good process reliability

The steps to a thread that satisfies the gauge.

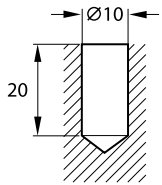
The generation of a correct thread requires not only the cutting of the thread itself but also several preparatory and subsequent operations. This begins with selection of the correct core hole diameter and ends with the checking of the finished thread.



Core hole drilling – important component of a thread.

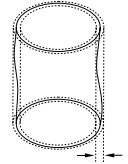
Core hole drilling is not just part of a thread, it also enormously influences the thread machining process and the service life of the thread-cutting tool.

Taps and fluteless taps can only work reliably if certain important rules are adhered to during the preparatory work stage.

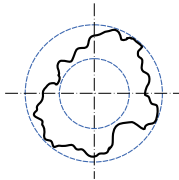


Core hole diameter / length

Straightness

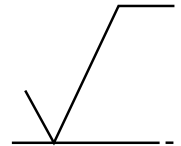


Key criteria for the core hole for thread generation to good process reliability



Roundness

Surface



Tolerance situation

Taps/fluteless taps

The tolerance band of a tap or fluteless tap is significantly narrower than the permissible tolerance range of the finished thread.

The tolerance is designed so that a correct thread is generated from the start. The tool wears in service and eventually reaches the point where the correct thread profile can no longer be produced: The thread is now smaller than the lower tolerance of the "Go" gauge.

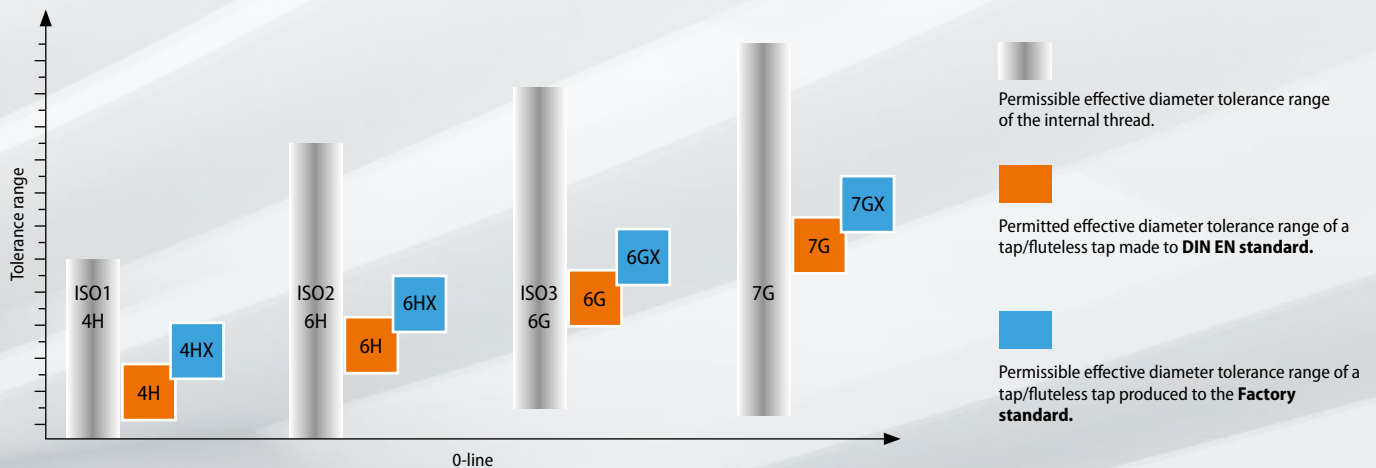
The tolerance for the tap or fluteless tap could then be positioned at the upper part of the internal thread area. Here there is, however, the risk of producing an oversized thread which is above the upper limit of the "No Go" gauge.

Taps or fluteless taps with "X" tolerance used on materials that have no problem with oversize are positioned higher in the tolerance zone. The result is longer tool life as a result of higher wear tolerance.

Thread mill

The tolerance of the thread mill has no effect on the tolerance situation of the thread to be produced. The required tolerance is governed by the machine tool and is generated by a circular movement of the tool. Tool wear can be compensated by programming.

Schematic diagram of common metric production tolerances

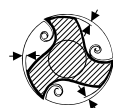




Hand tap sets

Size M2.3 and M2.6 to old DIN profile.

13 0250/0150 – Set of three, **consisting of taper, second, and plug tap.**



Flanks relief ground.

ISO 1
4H
≤ M1.4

ISO 2
6H
≥ M1.6

3-piece
set



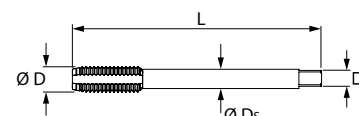
No. 1 – Taper tap



No. 2 – Second tap



No. 3 – Plug tap

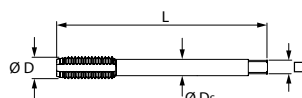


Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	Alu cast > 10 % Si < 500 N 											INOX < 900 N 	INOX > 900 N 	Ti > 850 N 	GG(G) 	Uni 					
ISO code	N 	N 	N 	P 	P 	P 	P 	P 	H 	H 	H 	H 	H 	M 	M 	S 	K 						
13 0150–13 0250																							

M	11G 13 0150	11G 13 0160	11G 13 0170	11G 13 0180	12G 13 0250	Thread pitch	L		Ø D _s	□	Tapping hole Ø
	Hand tap set	Garant Hand tap, single			HOLEX Hand tap set		13 0150 13 0160 13 0170 13 0180	13 0250			
		Taper tap	Second tap	Plug tap		mm	mm	mm	mm	mm	mm
M1	eShop	—	—	—	—	0.25	25	—	2.5	2.1	0.75
M1,2	eShop	—	—	—	—	0.25	25	—	2.5	2.1	0.95
M1,4	eShop	—	—	—	—	0.3	28	—	2.5	2.1	1.1
M1,6	eShop	—	—	—	—	0.35	32	—	2.5	2.1	1.25
M2	eShop	eShop	eShop	eShop	—	0.4	32	—	2.8	2.1	1.6
M2,2	eShop	—	—	—	—	0.45	32	—	2.8	2.1	1.75
M2,3	eShop	—	—	—	—	0.4	32	—	2.8	2.1	1.9
M2,5	eShop	eShop	eShop	eShop	—	0.45	36	—	2.8	2.1	2.05
M2,6	eShop	eShop	eShop	eShop	—	0.45	36	—	2.8	2.1	2.1
M3	eShop	eShop	eShop	eShop	eShop	0.5	36	40	3.5	2.7	2.5
M3,5	eShop	eShop	eShop	eShop	—	0.6	40	—	4	3	2.9
M4	eShop	eShop	eShop	eShop	eShop	0.7	40	45	4.5	3.4	3.3
M4,5	eShop	—	—	—	—	0.75	45	—	6	4.9	3.7
M5	eShop	eShop	eShop	eShop	eShop	0.8	45	50	6	4.9	4.2
M6	eShop	eShop	eShop	eShop	eShop	1	50	50	6	4.9	5
M7	eShop	—	—	—	—	1	50	—	6	4.9	6
M8	eShop	eShop	eShop	eShop	eShop	1.25	56	63	6	4.9	6.8
M9	eShop	—	—	—	—	1.25	56	—	7	5.5	7.8
M10	eShop	eShop	eShop	eShop	eShop	1.5	63	70	7	5.5	8.5
M12	eShop	eShop	eShop	eShop	eShop	1.75	70	75	9	7	10.2
M14	eShop	eShop	eShop	eShop	eShop	2	70	80	11	9	12
M16	eShop	eShop	eShop	eShop	eShop	2	70	80	12	9	14
M18	eShop	eShop	eShop	—	eShop	2.5	80	95	14	11	15.5
M20	eShop	eShop	eShop	eShop	eShop	2.5	95	95	16	12	17.5
M22	eShop	eShop	eShop	eShop	—	2.5	100	—	18	14.5	19.5
M24	eShop	eShop	eShop	eShop	—	3	110	—	18	14.5	21
M27	eShop	eShop	eShop	eShop	—	3	110	—	20	16	24
M30	eShop	eShop	eShop	eShop	—	3.5	125	—	22	18	26.5



The diagram shows three sequential stages of a single-flute drill bit being used to drill a hole in a workpiece. The first stage is labeled 'Taper tap', the second 'Second tap', and the third 'Plug tap'. A 'Pilot pin' is shown at the bottom left, indicating the initial point of contact.



No. 1 – Taper tap



No. 2 – Second tap

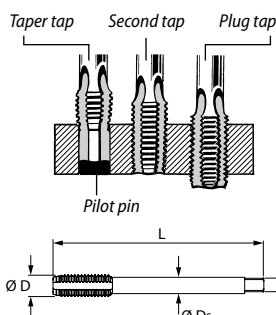


No. 3 – Plug tap
13 0400

M	11G	13 0400	11G	13 0410	11G	13 0420	11G	13 0430	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Hand tap set	Hand tap, single											
		Taper tap	Second tap	Plug tap									
M2		eShop	—	—	—	0.4	36	2.8	2.1	1.6			
M2,5		eShop	—	—	—	0.45	40	2.8	2.1	2.05			
M3		eShop	eShop	eShop	eShop	0.5	40	3.5	2.7	2.5			
M3,5		eShop	—	—	—	0.6	45	4	3	2.9			
M4		eShop	eShop	eShop	eShop	0.7	45	4.5	3.4	3.3			
M5		eShop	eShop	eShop	eShop	0.8	50	6	4.9	4.2			
M6		eShop	eShop	eShop	eShop	1	50	6	4.9	5			
M8		eShop	eShop	eShop	eShop	1.25	56	6	4.9	6.8			
M10		eShop	eShop	eShop	eShop	1.5	70	7	5.5	8.5			
M12		eShop	eShop	eShop	eShop	1.75	75	9	7	10.2			
M16		eShop	eShop	eShop	eShop	2	80	12	9	14			
M20		eShop	eShop	eShop	eShop	2.5	95	16	12	17.5			
M22		eShop	eShop	eShop	eShop	2.5	100	18	14.5	19.5			
M24		eShop	eShop	eShop	eShop	3	110	18	14.5	21			
M27		eShop	eShop	eShop	eShop	3	110	20	16	24			
M30		eShop	eShop	eShop	eShop	3.5	125	22	18	26.5			



Recommendation: For **TOOLOX** materials we recommend **deviating from the DIN** data (see table) by drilling the tapping hole **0.05 to 0.3 mm** larger.



No. 1 – Taper tap

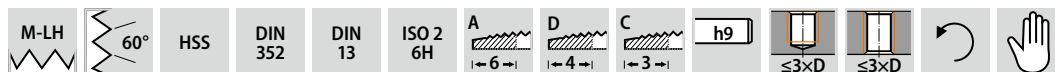


No. 2 – Second tap



No. 3 – Plug tap
13 0450

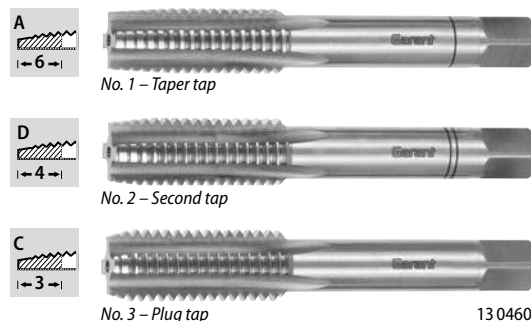
M	11G	13 0450	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Hand tap set						
	nitrided						
M2		eShop	mm	mm	mm	mm	mm
M2,5		eShop	0.4	36	2.8	2.1	1.6
M3		eShop	0.45	40	2.8	2.1	2.05
M4		eShop	0.5	40	3.5	2.7	2.5
M5		eShop	0.7	45	4.5	3.4	3.3
M6		eShop	0.8	50	6	4.9	4.2
M8		eShop	1	50	6	4.9	5
M10		eShop	1.25	56	6	4.9	6.8
M12		eShop	1.5	70	7	5.5	8.5
M14		eShop	1.75	75	9	7	10.2
M16		eShop	2	80	11	9	12
M20		eShop	2	80	12	9	14
		eShop	2.5	95	16	12	17.5



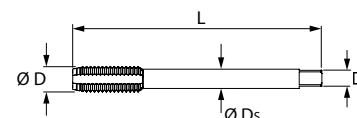
Garant Hand tap sets, left-hand thread

Set of three, consisting of taper, second, and plug tap.

Application: For metric left-hand thread to DIN13.



13 0460



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	K					
13 0460	○	○	○	●	●	●											○	●	●			○	

M-LH	TIG	13 0460	Thread pitch	L	Ø D _s	□	Tapping hole Ø
		Hand tap set, left-hand thread	mm	mm	mm	mm	mm
M2		eShop	0.4	36	2.8	2.1	1.6
M3		eShop	0.5	40	3.5	2.7	2.5
M4		eShop	0.7	45	4.5	3.4	3.3
M5		eShop	0.8	50	6	4.9	4.2
M6		eShop	1	50	6	4.9	5
M8		eShop	1.25	56	6	4.9	6.8
M10		eShop	1.5	70	7	5.5	8.5
M12		eShop	1.75	75	9	7	10.2
M14		eShop	2	80	11	9	12
M16		eShop	2	80	12	9	14
M20		eShop	2.5	95	16	12	17.5

Avoid incorrect cutting, especially with small threads!

Our adjustable GARANT micro tap wrench with round vial permits exact axial guidance when cutting by hand, even for the smallest threads.

Garant

GARANT micro tap wrench, adjustable

- Permits precise perpendicular guidance.
- Removable round vial with magnetic fastener for visual alignment.
- Can also be used for direct mounting in a die stock 14 9310_25×9.
- Suitable for hand taps size M1–M3.



All further product information can be found in our product group Retaining Tools Group 14 or in the e-shop.

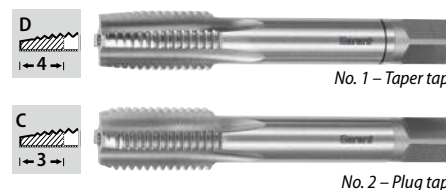
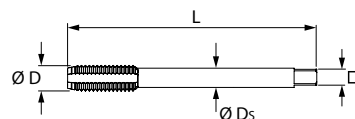


ISO 1 4H	ISO 2 6H
$2 \times 0,25$	$\geq 3 \times 0,35$

**2-piece
set**

Hand tap sets

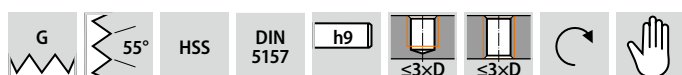
2-piece set **comprising taper and plug tap.**
Thread ground from solid and relief ground.



No. 1 – Taper tap

No. 2 – Plug tap

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si 										INOX	INOX	Ti	GG(G)	Uni					
	ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K				
13 0470/0500																						

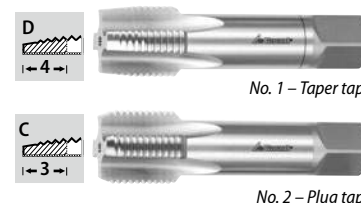
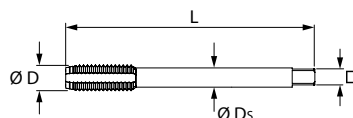
[illegible]

**2-piece
set**

Hand tap sets

13 0550/0660 – 2-piece set **comprising taper and plug tap.**

Application: For Whitworth parallel pipe threads DIN-ISO 228/1 (threads that do not form a seal within the connection).



No. 1 – Taper tap

No. 2 – Plug tap

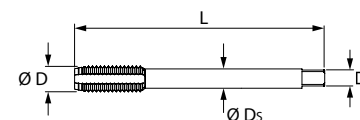
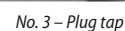
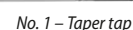
Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
	ISO code 13 0550—13 0660	N 	N 	N 	P 	P 	P 	P 	P 	H 	H 	H 	H 	H 	M 	M 	S 	K 					

G	11G	13 0550	11G	13 0560	12G	13 0660	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
												
	Hand tap set		Hand tap Plug tap		Hand tap set							
G1/8	eShop		eShop		eShop		28	mm	mm	mm	mm	mm
G1/4	eShop		eShop		eShop		19	9.73	63	7	5.5	8.8
G3/8	eShop		eShop		eShop		19	13.16	70	11	9	11.8
G1/2	eShop		eShop		eShop		19	16.66	70	12	9	15.25
G1/2	eShop		eShop		eShop		14	20.96	80	16	12	19
G5/8	eShop		—		—		14	22.91	80	18	14.5	21
G3/4	eShop		eShop		eShop		14	26.44	90	20	16	24.5
G1	eShop		eShop		eShop		11	33.25	100	25	20	30.75
G1.1/4	eShop		—		—		11	41.91	125	32	24	39.5
G1.1/2	eShop		—		—		11	47.8	140	36	29	45.25
G2	eShop		—		—		11	59.61	160	45	35	57



Application: For Whitworth threads to BSW standard BS84 in the tolerance field "medium".

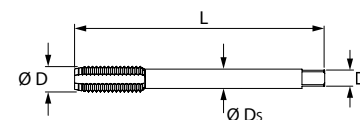
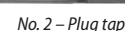
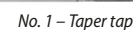
Application: For Whitworth threads to BSW standard BS84 in the tolerance field "medium".



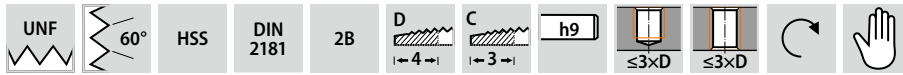
BSW	11G	13 0670	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	Hand tap set							
				mm	mm	mm	mm	mm
W1/8		eShop	40	3.18	40	3.5	2.7	2.5
W5/32		eShop	32	3.97	45	4.5	3.4	3.1
W3/16		eShop	24	4.76	50	5.5	4.3	3.6
W7/32		eShop	24	5.56	50	6	4.9	4.4
W1/4		eShop	20	6.35	56	6	4.9	5.1
W5/16		eShop	18	7.94	63	6	4.9	6.5
W3/8		eShop	16	9.53	70	7	5.5	7.9
W1/2		eShop	12	12.7	80	9	7	10.5
W5/8		eShop	11	15.88	90	12	9	13.5
W3/4		eShop	10	19.05	105	14	11	16.5
W7/8		eShop	9	22.23	110	18	14.5	19.25
W1		eShop	8	25.4	110	20	16	22



Application: For UNC uniform coarse threads ASME – B1.1.



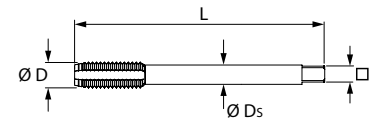
UNC	11G	13 0700	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	Hand tap set							
				mm	mm	mm	mm	mm
2-56		eShop	56	2.18	36	2.8	2.1	1.85
3-48		eShop	48	2.51	40	2.8	2.1	2.1
4-40		eShop	40	2.84	40	3.5	2.7	2.35
6-32		eShop	32	3.51	45	4	3	2.85
8-32		eShop	32	4.16	45	4.5	3.4	3.5
10-24		eShop	24	4.83	50	5.5	4.3	3.9
12-24		eShop	24	5.49	50	6	4.9	4.5
1/4-20		eShop	20	6.35	56	6	4.9	5.1
5/16-18		eShop	18	7.94	63	6	4.9	6.6
3/8-16		eShop	16	9.53	70	7	5.5	8
7/16-14		eShop	14	11.11	75	8	6.2	9.4
1/2-13		eShop	13	12.7	80	9	7	10.8
5/8-11		eShop	11	15.88	90	12	9	13.5
3/4-10		eShop	10	19.05	105	14	11	16.5



Garant Hand tap sets

2-piece set **comprising taper and plug tab.**

Application: For UNF uniform fine threads ASME – B1.1.



No. 1 – Taper tap



No. 2 – Plug tap

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 													INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K						
13 0750	○	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●				○

UNF	11G	13 0750	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
		Hand tap set		mm	mm	mm	mm	mm
10-32		eShop	32	4.83	50	5.5	4.3	4.1
1/4-28		eShop	28	6.35	50	6	4.9	5.5
5/16-24		eShop	24	7.94	56	6	4.9	6.9
3/8-24		eShop	24	9.53	63	7	5.5	8.5
7/16-20		eShop	20	11.11	63	8	6.2	9.9
1/2-20		eShop	20	12.7	63	9	7	11.5
9/16-18		eShop	18	14.29	70	11	9	12.9
5/8-18		eShop	18	15.88	70	12	9	14.5



Garant Trapezoidal hand tap sets

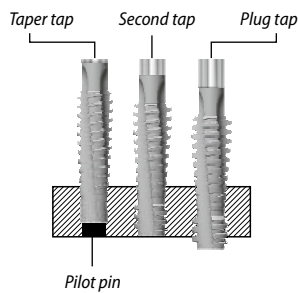
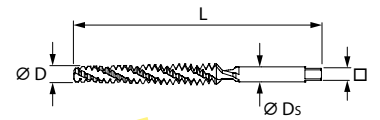
13 0760 – ■ **Taper tap with long pilot pin**

- Plug tap tolerance 7H

3-piece set, **consisting of taper, second, and plug tap.**

13 0790 – ■ Plug tap tolerance 7H

Note: Tool unsuitable for reversing out.



No. 1 – Taper tap



No. 2 – Second tap



No. 3 – Plug tap

13 0760

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
13 0760–13 0790	○	○	○	●	●	●								●	○	○	●	●	●				

Tr	11G	13 0760	11G	13 0790	Thread pitch	L	Ø D _s		Tapping hole Ø
	Trapezoidal hand tap set		Individual trapezoidal hand tap						
	Plug tap								
					mm	mm	mm	mm	mm
TR8×1,5		eShop		eShop	1.5	80	6	4.9	6.6
TR10×2		eShop		eShop	2	90	7	5.5	8.2
TR10×3		eShop		eShop	3	100	7	5.5	7.25
TR12×3		eShop		eShop	3	110	8	6.2	9.25
TR14×3		eShop		eShop	3	130	10	8	11.25
TR14×4		eShop		eShop	4	130	9	7	10.25
TR16×4		eShop		eShop	4	140	11	9	12.25
TR18×4		eShop		eShop	4	150	12	9	14.25
TR20×4		eShop		eShop	4	160	15	12	16.25
TR22×5		eShop		eShop	5	180	16	12	17.25
TR24×5		eShop		eShop	5	190	18	14.5	19.25



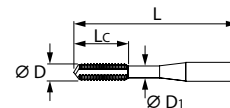
HOLEX Tap bit with a spiral point

With 1/4 inch hexagon shank to DIN 3126 C 6.3.

Application: Ideal for repair and assembly work in mobile situations.



13 0992



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 0992	○	●	●	●	●	○								○					●				

M	12H	13 0992	Thread pitch	L	L _c	Ø D ₁	Tapping hole Ø
		Tap bit					
		vaporised	mm	mm	mm	mm	mm
M3		eShop	0.5	33	10	2.2	2.5
M4		eShop	0.7	35	11	2.9	3.3
M5		eShop	0.8	36	16	3.8	4.2
M6		eShop	1	39	16	4.5	5
M8		eShop	1.25	40	18	6	6.8
M10		eShop	1.5	41	21	7	8.5
M12		eShop	1.75	52	22	10	10.2

Tap bit set



13 0996

for metric threads		M3-10
12K 13 0996	Tap bit set with coupling shank	eShop
Content:		Size M3; M4; M5; M6; M8; M10
1 each tap bit 130992		Size 6.3
1 coupling piece No. 675025		

Vision is our most valuable sense. Protect it! Safety glasses – VOLUME 4



Around 85% of the impressions perceived by your senses are received by our eyes.
So it is more important than ever to protect our eyes against any sort of negative influences.

Safety glasses for every challenge.

We offer the right safety glasses for every situation. Our range includes a wide range of models that meet the highest safety standards while being very comfortable to wear – whether you need safety glasses with side arms, over-specs, safety goggles or prescription safety glasses.

All further product information can be found in our **eye protection** product group in **Volume 4** or in the **eShop**.





Garant GARANT Master Tap Alu through hole machine tap

High-performance tap, specially developed for **aluminium and non-ferrous alloys**. **Extra-long clamping slots** and neck length for usable **thread depth up to 4xD**.

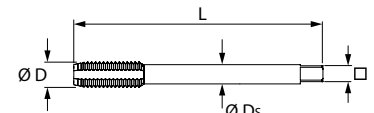
- **HSS-E-PM tool material** for high cutting edge stability.
- **Ultra-smooth DLC coating** for wear resistance and avoidance of edge build-up.
- **Extra-long flute geometry**.
13 1115 – With extra long shank.



13 1110



13 1115



Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
13 1110/1115	35	32	20	20		18	18										18	25					

M	13 1110	13 1115	Thread pitch	L		Ø D _i	□	Tapping hole Ø
	GARANT Master Tap Alu machine tap							
	DLC	extra long DLC	mm	13 1110 mm	13 1115 mm	mm	mm	mm
M1,6	eShop	—	0.35	40	—	2.5	2.1	1.25
M2	eShop	—	0.4	47	—	2.8	2.1	1.6
M2,5	eShop	—	0.45	55	—	2.8	2.1	2.05
M3	eShop	eShop	0.5	56	100	3.5	2.7	2.5
M4	eShop	eShop	0.7	65	125	4.5	3.4	3.3
M5	eShop	eShop	0.8	72	160	6	4.9	4.2
M6	eShop	eShop	1	85	160	6	4.9	5
M8	eShop	eShop	1.25	105	180	8	6.2	6.8
M10	eShop	eShop	1.5	115	200	10	8	8.5
M12	eShop	eShop	1.75	115	200	9	7	10.2
M14	eShop	—	2	125	—	11	9	12
M16	eShop	eShop	2	135	200	12	9	14
M20	eShop	eShop	2.5	160	200	16	12	17.5

Garant GARANT MASTER TAP ALU

Developed for the highest performance in non-ferrous metals.

- **Dynamic flute geometry**
which has been perfectly adapted to non-ferrous metals.
- **Outstanding tool life**
thanks to special DLC coating.
- **High wear resistance**
thanks to high-quality HSS-E-PM tool material.
- **Developed for maximum thread depths**
up to 4XD for through-hole tapped bores.



Garant MASTER TAP ALU



Garant Synchronised through hole machine taps

Sturdy design with spiral point and shank to DIN 1835-B. Special geometry for use on machines with **synchronised spindle drives**. Guidance is provided by the synchronising spindle of the machine.

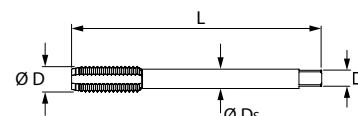
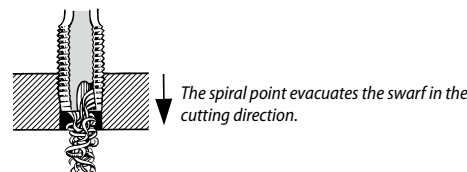
With the latest generation of special **DLC coating sp²** for optimum tool life.

For use with **emulsion** (fat content minimum 8%).

Note: For use on synchronised spindles, the **GARANT** quick-change tapping chuck No. 338100 – 338121 with minimum length adjustment (MLA) ensures very high process reliability.

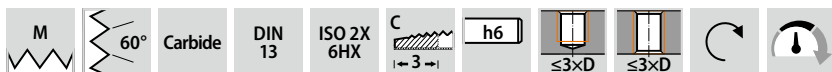


13 1125



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	Cu	CuZn	GRP	CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
13 1125	30	30	25	25					5			15		25	55	35	6	4					

M	13 1125	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap for synchronised spindles					
	HSS-E-PM					
	DLC	mm	mm	mm	mm	mm
M2,5	eShop	0.45	70	6	4.9	2.05
M3	eShop	0.5	70	6	4.9	2.5
M4	eShop	0.7	70	6	4.9	3.3
M5	eShop	0.8	70	6	4.9	4.2
M6	eShop	1	80	6	4.9	5
M8	eShop	1.25	90	8	6.2	6.8
M10	eShop	1.5	100	10	8	8.5
M12	eShop	1.75	110	12	9	10.2
M16	eShop	2	110	12	9	14



DIN 371	DIN 376
≤ M10	M12

Garant Carbide through hole and blind hole machine tap, for GRP/CRP

For use with **emulsion** (fat content minimum 8%).

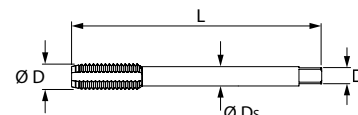
Size M12 – **Carbide inserts**.

Size M3–M10 – **Solid carbide version**.

Advantage: Particularly strong, optimal self-guidance.

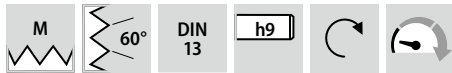


13 1140



Suitable for/ v _c [m/min]	Alu	Alu	Alu																				
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
13 1140	18	35	28	30													24	10					

M	13 1140	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Carbide machine tap					
		mm	mm	mm	mm	mm
M3	eShop	0.5	56	3.5	2.7	2.5
M4	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	0.8	70	6	4.9	4.2
M6	eShop	1	80	6	4.9	5
M8	eShop	1.25	90	8	6.2	6.8
M10	eShop	1.5	100	10	8	8.5
M12	eShop	1.75	110	9	7	10.2



HSS E	HSS	ISO 1 4H	ISO 2 6H
≤ M24	≥ M27	≤ M1.4	≥ M1.6

Through hole machine tap

With spiral point.

- 13 1150 – Size M2.3 and M2.6 to old DIN profile.
 13 1200 – **All sizes: Shank to DIN 376 (= shank Ø tapered)**, thus suitable for greater operating depths
 Sizes M2; M2.5; M3 **without square**.
 13 1250 – (Form C) 2–3 turns chamfer lead – **without spiral point**. Can also be used for blind holes.

With TiN coating for:

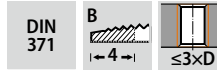
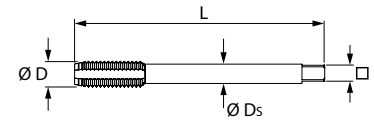
- Improved wear properties.
 - Lower tendency to edge build-up.
 - Higher cutting speeds possible.
- For use with **emulsion** (fat content minimum 8%).

- 13 1265 – **HOLEX Clever Tap:**
 Sturdy tap for conventional standard applications. High-quality HSS-E tool material and geometry for steels. Surface: Bronze-coloured tempered thread profile.

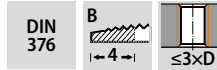
- 13 1760 – **With extra long shank.**
 ≤ M10: Shank to DIN 371;
 ≥ M12: Shank to DIN 376.

Advantage:

- 13 1760 – Designed for tapping threads where access is difficult.



13 1150



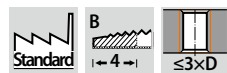
13 1200



13 1250



13 1265



13 1760

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
13 1150/1200/1760					15	15													●	○			
13 1250		16			20	19													●	●			
13 1265		13	13		12	12	6												●	●			

M	1H 13 1150	1H 13 1200	1H 13 1250	12H 13 1265	1H 13 1760	Thread pitch	L		Ø D _s		□		Tapping hole Ø
	Garant			HOLEX	Garant								
	Machine tap			HOLEX Clever Tap machine tap	Machine tap								
	Form B DIN 371	Form B DIN 376	Form C DIN 371/376	Form B DIN 371/376	Form B, extra long								
			TiN										
13 1150 13 1200 13 1250 13 1265	13 1760	13 1150 13 1250 13 1265 13 1760	13 1200	13 1150 13 1250 13 1265 13 1760	13 1200	mm	mm	mm	mm	mm	mm		
M1	eShop	—	—	—	—	0.25	40	—	2.5	—	2.1	—	0.75
M1,2	eShop	—	—	—	—	0.25	40	—	2.5	—	2.1	—	0.95
M1,4	eShop	—	—	—	—	0.3	40	—	2.5	—	2.1	—	1.1
M1,6	eShop	—	—	—	—	0.35	40	—	2.5	—	2.1	—	1.25
M1,7	eShop	—	—	—	—	0.35	40	—	2.5	—	2.1	—	1.3
M1,8	eShop	—	—	—	—	0.35	40	—	2.5	—	2.1	—	1.45
M2	eShop	eShop	—	—	—	0.4	45	—	2.8	1.4	2.1	—	1.6
M2,2	eShop	—	—	—	—	0.45	45	—	2.8	—	2.1	—	1.75
M2,3	eShop	—	—	—	—	0.4	45	—	2.8	—	2.1	—	1.9
M2,5	eShop	eShop	—	—	—	0.45	50	—	2.8	1.8	2.1	—	2.05
M2,6	eShop	—	—	—	—	0.45	50	—	2.8	—	2.1	—	2.1
M3	eShop	eShop	eShop	eShop	eShop	0.5	56	112	3.5	2.2	2.7	—	2.5
M3,5	eShop	—	—	—	—	0.6	56	—	4	—	3	—	2.9
M4	eShop	eShop	eShop	eShop	eShop	0.7	63	112	4.5	2.8	3.4	2.1	3.3
M5	eShop	eShop	eShop	eShop	eShop	0.8	70	125	6	3.5	4.9	2.7	4.2
M6	eShop	eShop	eShop	eShop	eShop	1	80	125	6	4.5	4.9	3.4	5
M7	eShop	—	—	—	—	1	80	—	7	—	5.5	—	6
M8	eShop	eShop	eShop	eShop	eShop	1.25	90	140	8	6	6.2	4.9	6.8
M10	eShop	eShop	eShop	eShop	eShop	1.5	100	160	10	7	8	5.5	8.5
M12	—	eShop	eShop	eShop	eShop	1.75	110	180	9	9	7	7	10.2
M14	—	eShop	eShop	—	—	2	110	—	11	11	9	9	12
M16	—	eShop	eShop	eShop	eShop	2	110	220	12	12	9	9	14
M18	—	eShop	—	—	—	2.5	125	—	—	14	—	11	15.5
M20	—	eShop	eShop	eShop	eShop	2.5	140	280	16	16	12	12	17.5
M22	—	eShop	—	—	—	2.5	140	—	—	18	—	14.5	19.5
M24	—	eShop	eShop	eShop	—	3	160	—	18	18	14.5	14.5	21
M27	—	eShop	—	—	—	3	160	—	—	20	—	16	24
M30	—	eShop	eShop	—	—	3.5	180	—	22	22	18	18	26.5
M33	—	eShop	—	—	—	3.5	180	—	—	25	—	20	29.5
M36	—	eShop	eShop	—	—	4	200	—	28	28	22	22	32



Garant Through hole machine tap

With spiral point.

13 1290 – (Form CS) 2 – 3 turns chamfer lead – **with spiral point.**

Advantage: Greater wear resistance.

DIN 371
≤ M10

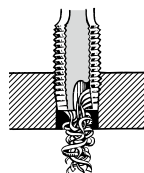
DIN 376
≥ M12



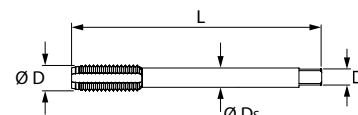
13 1280



13 1290

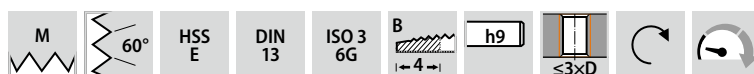


The spiral point evacuates the swarf in the cutting direction.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	Cast < 500 N	Cast < 750 N	Cast < 900 N	Cast < 1100 N	Cast < 1400 N	Cast < 55 HRC	Cast < 60 HRC	Cast < 65 HRC	Cast < 67 HRC	Cast < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni	Oil	Water	Emulsion	High pressure	Low pressure
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N		●	○			
13 1280/1290	15			18	18	18	9																

M	13 1280	13 1290	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap						
	HSS-E-PM Form B	HSS-E-PM Form CS	mm	mm	mm	mm	mm
M3	eShop	eShop	0.5	56	3.5	2.7	2.5
M4	eShop	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	eShop	0.8	70	6	4.9	4.2
M6	eShop	eShop	1	80	6	4.9	5
M8	eShop	eShop	1.25	90	8	6.2	6.8
M10	eShop	eShop	1.5	100	10	8	8.5
M12	eShop	eShop	1.75	110	9	7	10.2
M16	eShop	eShop	2	110	12	9	14
M20	eShop	eShop	2.5	140	16	12	17.5



Garant Through hole machine tap

With spiral point.

Tolerance class ISO 3 / 6G = oversize 0.02 – 0.04 mm.

13 1350 – All sizes: Shank to DIN 376 (= shank Ø relieved); thus suitable for greater operating depths.

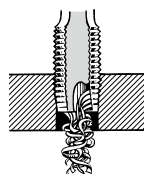
Application: For components which are **galvanised** after threading or shrink slightly when hardened.



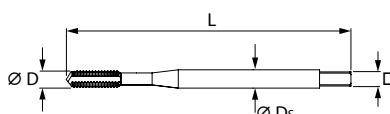
13 1300



13 1350



The spiral point evacuates the swarf in the cutting direction.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	Cast < 500 N	Cast < 750 N	Cast < 900 N	Cast < 1100 N	Cast < 1400 N	Cast < 55 HRC	Cast < 60 HRC	Cast < 65 HRC	Cast < 67 HRC	Cast < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni	Oil	Water	Emulsion	High pressure	Low pressure
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N		●	○			
13 1300/1350	13			15	15																		

M	11H	13 1300	11H	13 1350	Thread pitch	L	Ø D _s		□		Tapping hole Ø
	Machine tap						13 1300	13 1350	13 1300	13 1350	
	6G DIN 371	6G DIN 376	mm	mm							
M2		eShop		—	0.4	45	2.8	—	2.1	—	1.6
M2,5		eShop		—	0.45	50	2.8	—	2.1	—	2.05
M3		eShop		—	0.5	56	3.5	—	2.7	—	2.5
M3,5		eShop		—	0.6	56	4	—	3	—	2.9
M4		eShop		—	0.7	63	4.5	—	3.4	—	3.3
M5		eShop		—	0.8	70	6	—	4.9	—	4.2
M6		eShop		—	1	80	6	—	4.9	—	5
M8		eShop		eShop	1.25	90	8	6	6.2	4.9	6.8
M10		eShop		eShop	1.5	100	10	7	8	5.5	8.5
M12		—		eShop	1.75	110	—	9	—	7	10.2
M14		—		eShop	2	110	—	11	—	9	12
M16		—		eShop	2	110	—	12	—	9	14
M20		—		eShop	2.5	140	—	16	—	12	17.5



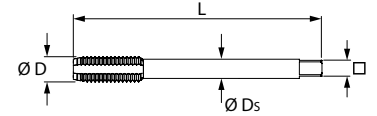
Garant Spiral point tap for through holes, short

With spiral point.

Application: As hand or machine tap.

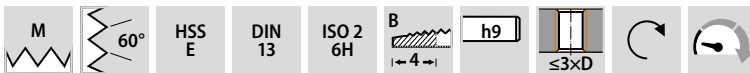


13 1450



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast  > 10% Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	N						
	13 1450	13		15	15																	

M	1H	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	13 1450					
	Spiral point tap					
	short	mm	mm	mm	mm	mm
M2	eShop	0.4	36	2.8	2.1	1.6
M2,5	eShop	0.45	40	2.8	2.1	2.05
M3	eShop	0.5	40	3.5	2.7	2.5
M4	eShop	0.7	45	4.5	3.4	3.3
M5	eShop	0.8	50	6	4.9	4.2
M6	eShop	1	50	6	4.9	5
M8	eShop	1.25	56	6	4.9	6.8
M10	eShop	1.5	70	7	5.5	8.5
M12	eShop	1.75	75	9	7	10.2
M16	eShop	2	80	12	9	14



DIN 371	DIN 376
$\leq M10$	$\geq M12$

Garant Through hole machine tap with interrupted thread

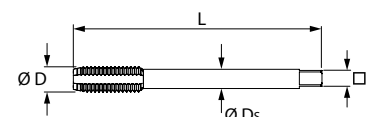
Spiral point.

With interrupted thread, this **reduces torque** and **improves distribution of the lubricant**.

Advantage: Ideally suited for use on resilient materials and thin-walled components.
Low frictional resistance, thus no material deformation is caused.



13 1650



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Graphite GRP CRP						
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N	●	○			
	13	16	13	15	15												9							

M	11H	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	13 1650					
	Machine tap with interrupted thread	mm	mm	mm	mm	mm
M2	eShop	0.4	45	2.8	2.1	1.6
M3	eShop	0.5	56	3.5	2.7	2.5
M4	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	0.8	70	6	4.9	4.2
M6	eShop	1	80	6	4.9	5
M8	eShop	1.25	90	8	6.2	6.8
M10	eShop	1.5	100	10	8	8.5
M12	eShop	1.75	110	9	7	10.2
M16	eShop	2	110	12	9	14
M20	eShop	2.5	140	16	12	17.5



DIN 371	DIN 376
≤ M10	≥ M12

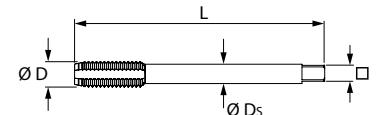
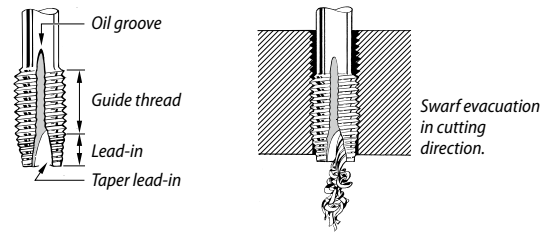
Garant Through hole machine tap

Strong spiral point. Guide section with oil grooves, but without chip flutes.

Advantage: Particularly strong, optimum self-guidance and no recutting when reversed.

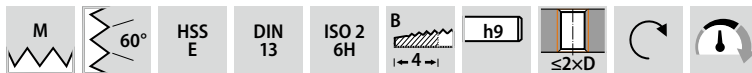


13 1850



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	G(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
13 1850	13	13	15	15	15	15											9	13	●	○			

M	13 1850	Thread pitch	L	Ø D _s	□	Tapping hole Ø	M	13 1850	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap	mm	mm	mm	mm	mm		Machine tap	mm	mm	mm	mm	mm
M2	eShop	0.4	45	2.8	2.1	1.6	M6	eShop	1	80	6	4.9	5
M2,5	eShop	0.45	50	2.8	2.1	2.05	M8	eShop	1.25	90	8	6.2	6.8
M3	eShop	0.5	56	3.5	2.7	2.5	M10	eShop	1.5	100	10	8	8.5
M3,5	eShop	0.6	56	4	3	2.9	M12	eShop	1.75	110	9	7	10.2
M4	eShop	0.7	63	4.5	3.4	3.3	M16	eShop	2	110	12	9	14
M5	eShop	0.8	70	6	4.9	4.2	M20	eShop	2.5	140	16	12	17.5



DIN 371	DIN 376
≤ M10	≥ M12

Garant Through hole machine tap with interrupted thread

Spiral point.

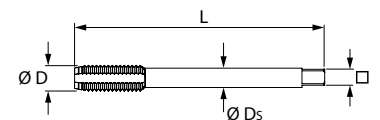
With interrupted thread, this **reduces torque** and **improves distribution of the lubricant**.

Advantage: Particularly suitable for thin-walled components. Low frictional resistance, thus no material deformation is caused.

Recommendation: For **TOOLOX** materials we recommend **deviating from the DIN data** (see table) by drilling the tapping hole **Ø 0.05 to 0.3 mm** larger.



13 1900

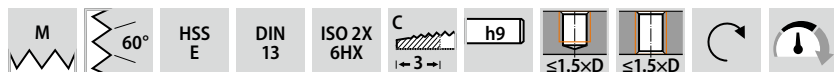


Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX 33 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N	●	○			
13 1900	13	13	15	15	15	15	6							3				13					

M	13 1900	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap with interrupted thread	mm	mm	mm	mm	mm
M3	eShop	0.5	56	3.5	2.7	2.5
M4	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	0.8	70	6	4.9	4.2
M6	eShop	1	80	6	4.9	5
M8	eShop	1.25	90	8	6.2	6.8
M10	eShop	1.5	100	10	8	8.5
M12	eShop	1.75	110	9	7	10.2
M16	eShop	2	110	12	9	14
M20	eShop	2.5	140	16	12	17.5



13



DIN 371
≤ M10

DIN 376
≥ M12

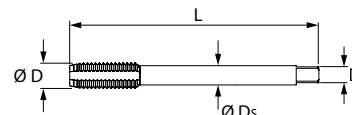
Garant Through and blind hole machine taps

Sturdy version.

Recommendation: For **TOOLOX** and **HARDOX** materials we recommend deviating from the DIN data (see table) by drilling the tapping hole $\varnothing$ 0.05 to 0.3 mm larger.



13 1950



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	HARDOX [®] 500 < 1600 N	INOX < 900 N	INOX > 900 N					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	M	M					
13 1950					15	15	6	3						4	3	3			●	○			

M	 13 1950	Thread pitch	L	∅ D _s		Tapping hole ∅
	Machine tap	mm	mm	mm	mm	mm
M2,5	eShop	0.45	50	2.8	2.1	2.05
M3	eShop	0.5	56	3.5	2.7	2.5
M3,5	eShop	0.6	56	4	3	2.9
M4	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	0.8	70	6	4.9	4.2
M6	eShop	1	80	6	4.9	5
M8	eShop	1.25	90	8	6.2	6.8
M10	eShop	1.5	100	10	8	8.5
M12	eShop	1.75	110	9	7	10.2
M14	eShop	2	110	11	9	12
M16	eShop	2	110	12	9	14
M20	eShop	2.5	140	16	12	17.5

Garant

THE PROBLEM SOLVER – DEVELOPED FOR HIGH-STRENGTH STEELS.

The GARANT Master Tap STEEL^{HT}: Developed for difficult-to-machine steels and materials with high tensile strength.

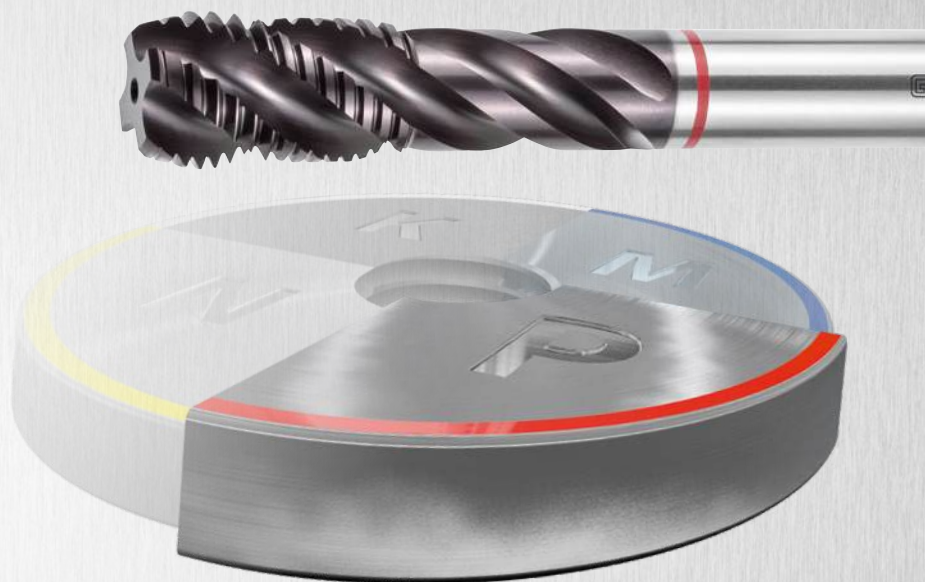
Garant MASTER TAP STEEL^{HT}

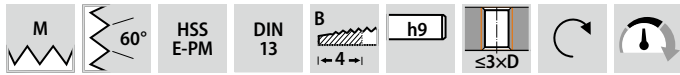
- Maximum performance.
- Outstanding for high-strength steels.
- Reliable.



Find out more:

The GARANT Master Tap range for reliable, economical production
<https://hog.tools/GARANT-Master-Tap>





DIN 371
DIN 376
≤ M10 ≥ M12

Garant GARANT Master Tap Steel^{HT} through hole machine tap

High-performance tap, specially developed for use in **steels with high tensile strength** and for **difficult-to-machine materials**. **Strong spiral point**, for process stability at high cutting forces.

- HSS-E-PM tool material – for **very high cutting edge stability**.
- Optimised honed cutting edges.
- TiCN coating – for **maximum wear protection**.

13 1946 – Tolerance class: ISO 3X/6GX.

Application:

13 1946 – For components which are galvanised or shrink slightly when hardened.

Recommendation: For **TOOLOX** and **HARDOX** materials we recommend deviating from the DIN data (see table) by selecting a larger tapping hole $\varnothing$.



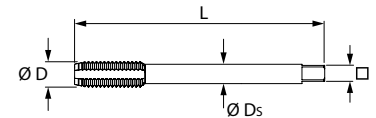
ISO 2X
6HX

13 1940



ISO 3X
6GX

13 1946



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX	Ti					
	N	N	N	P	P	P	P	P	P	P	P	P	P	P	H	H	H	H	H	H	H	H	H
ISO code	13 1940/1946			30	20	15	12	5	5	5	5	5	5	5	15	5	7	5					

M	13 1940	13 1946	Thread pitch	L	Ø D _i	□	Tapping hole Ø
	GARANT Master Tap Steel ^{HT} machine tap						
	HSS-E-PM Form B 6HX	HSS-E-PM Form B 6GX					
	TiCN	TiCN	mm	mm	mm	mm	mm
M3	eShop	eShop	0.5	56	3.5	2.7	2.5
M4	eShop	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	eShop	0.8	70	6	4.9	4.2
M6	eShop	eShop	1	80	6	4.9	5
M8	eShop	eShop	1.25	90	8	6.2	6.8
M10	eShop	eShop	1.5	100	10	8	8.5
M12	eShop	eShop	1.75	110	9	7	10.2
M14	eShop	eShop	2	110	11	9	12
M16	eShop	eShop	2	110	12	9	14
M20	eShop	eShop	2.5	140	16	12	17.5
M24	eShop	eShop	3	160	18	14.5	21
M27	eShop	—	3	160	20	16	24
M30	eShop	—	3.5	180	22	18	26.5

Garant GARANT MASTER TAP STEEL^{HT} – THE PROBLEM-SOLVER FOR HIGH-STRENGTH STEELS

Discover the outstanding characteristics of the GARANT Master Tap Steel^{HT}

Through hole

TiCN coating.
Very smooth coating surface. Reduction of cutting resistance in the push direction.

Special spiral point.
High stability.

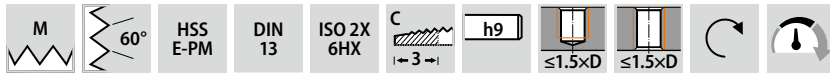
HSS-E-PM substrate.
High cutting edge stability and wear resistance.

Blind hole

TiAlN coating.
High heat resistance.
Low frictional resistance.

Optimised guide thread.
High process reliability due to avoidance of chip jamming.

Without interference contours.
Threads can be tapped almost to the bottom of the hole.



DIN 371	DIN 376
≤ M10	≥ M12

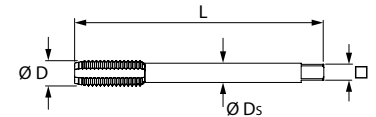
Garant Through and blind hole machine taps

Sturdy version.

Recommendation: For **very hard steels, TOOLOX** and **HARDOX** materials we recommend **deviating from the DIN data** (see table) by drilling the tapping hole $\varnothing 0.05$ to **0.3 mm** larger. For use only with a length compensation chuck – even on machines with synchronised spindle drives.



13 2055



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	HARDOX® 500 < 1600 N	INOX < 900 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	M	N					
13 2055								12	7	2				4	3	2		15					

M	13 2055	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap					
	HSS-E-PM					
	TiCN	mm	mm	mm	mm	mm
M4	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	0.8	70	6	4.9	4.2
M6	eShop	1	80	6	4.9	5
M8	eShop	1.25	90	8	6.2	6.8
M10	eShop	1.5	100	10	8	8.5
M12	eShop	1.75	110	9	7	10.2
M16	eShop	2	110	12	9	14
M20	eShop	2.5	140	16	12	17.5



Garant Synchronised through hole machine taps

Sturdy design with spiral point and shank to DIN 1835-B. Special geometry for use on machines with **synchronised spindle drives**. The tap is controlled by the synchronising spindle of the machine.

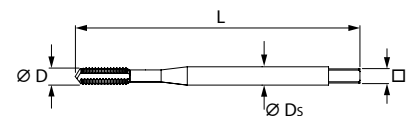
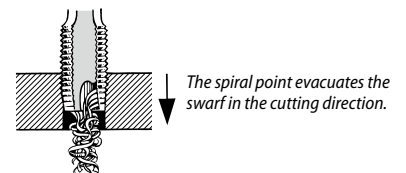
Special **TiAlN coating** for optimum tool life. For use with **emulsion** (fat content minimum 8%).

Recommendation: For **TOOLOX** materials we recommend **deviating from the DIN data** (see table) by drilling the tapping hole $\varnothing 0.05$ to **0.3 mm** larger.

Note: For use on **synchronised spindles**, the **GARANT** quick-change tapping chuck **No. 338100 – 338121 with minimum length adjustment (MLA)** ensures very high process reliability.



13 2065



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Ti					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M	S					
13 2065				37	35	22	12	7						7	6								

M	13 2065	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap for synchronised spindles					
	HSS-E-PM					
	TiAlN	mm	mm	mm	mm	mm
M3	eShop	0.5	70	6	4.9	2.5
M4	eShop	0.7	70	6	4.9	3.3
M5	eShop	0.8	70	6	4.9	4.2
M6	eShop	1	80	6	4.9	5
M8	eShop	1.25	90	8	6.2	6.8
M10	eShop	1.5	100	10	8	8.5
M12	eShop	1.75	110	12	9	10.2
M16	eShop	2	110	12	9	14

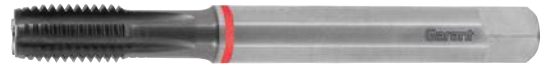


Garant Solid carbide machine tap for through and blind holes

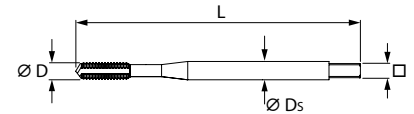
Particularly **sturdy version**. For the highest performance demands.

Application: For use only with a length compensation chuck – even on machines with synchronised spindle drives.

Recommendation: For **very hard steels, TOOLOX** and **HARDOX** materials we recommend **deviating from the DIN data** (see table) by drilling the tapping hole $\varnothing 0.05$ to **0.3 mm** larger.



13 2080



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si											TOOLOX 33 HRC	TOOLOX 44 HRC	HARDOX 500 < 1600 N	INOX < 900 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	P	P	P	P	H	H	H	H	M	N					
13 2080													3	2	1	1	5	4	3	18			

M	TH	13 2080	Thread pitch	L	$\varnothing D_i$	$\square$	Tapping hole $\varnothing$
		Solid carbide machine tap					
		TiAIN	mm	mm	mm	mm	mm
M3		eShop	0.5	63	4.5	3.4	2.5
M4		eShop	0.7	63	4.5	3.4	3.3
M5		eShop	0.8	70	6	4.9	4.2
M6		eShop	1	80	6	4.9	5
M8		eShop	1.25	90	8	6.2	6.8
M10		eShop	1.5	100	10	8	8.5
M12		eShop	1.75	110	12	9	10.2



Garant Through hole machine tap for stainless steels

Particularly sturdy design.

13 2150 – **Guide section with oil grooves**, but without chip flutes. **Lead chamfer form B**, with strong spiral point. Size M2.6 to the old DIN profile.

13 2155 – **Taper lead form D** with 15° left-hand spiral.

Advantage:

13 2150 – **Optimum self-guidance** and **no recutting** when reversed.

13 2155 – Special geometry enables **higher cutting speeds and long tool life in stainless steel**.

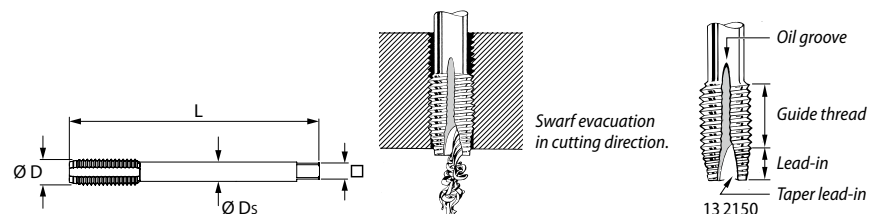
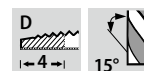
DIN 371	DIN 376
≤ M10	≥ M12



13 2150

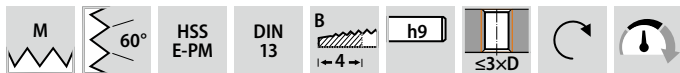


13 2155



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	P	P	P	P	H	H	H	H	M	N					
13 2150				13	15	15	15										6						
13 2155				13	15	15	15										13						

M	TH	13 2150	TH	13 2155	Thread pitch	L	$\varnothing D_i$	$\square$	Tapping hole $\varnothing$
		Machine tap							
		Form B vaporised		Form D vaporised	mm	mm	mm	mm	mm
M2		eShop		—	0.4	45	2.8	2.1	1.6
M2,5		eShop		—	0.45	50	2.8	2.1	2.05
M2,6		eShop		—	0.45	50	2.8	2.1	2.1
M3		eShop		eShop	0.5	56	3.5	2.7	2.5
M4		eShop		eShop	0.7	63	4.5	3.4	3.3
M5		eShop		eShop	0.8	70	6	4.9	4.2
M6		eShop		eShop	1	80	6	4.9	5
M8		eShop		eShop	1.25	90	8	6.2	6.8
M10		eShop		eShop	1.5	100	10	8	8.5
M12		eShop		eShop	1.75	110	9	7	10.2
M14		eShop		—	2	110	11	9	12
M16		eShop		—	2	110	12	9	14
M20		eShop		—	2.5	140	16	12	17.5
M24		eShop		—	3	160	18	14.5	21



GARANT Master Tap INOX through hole machine tap for stainless and acid-resistant steels

High-performance tap, specially developed for **good process reliability in stainless and acid-resistant steels** and **duplex materials**.

- **HSS-E-PM tool material** for maximum wear resistance
- The latest generation of **TiAlN multi-layer coating**
- **Parameterised flute geometry** for optimum chip formation and **torsional rigidity**

13 2190 – With internal coolant supply

13 2193 – **Tolerance class: ISO 3X/6GX**. For components which are **galvanised** or shrink slightly when hardened.

13 2195 – **With extra long shank**.

13 2195 Size M3–M10 – Shank to DIN371.

13 2195 Size M12–M24 – Shank to DIN376.

Advantage:

13 2195 – Designed for tapping threads where access is difficult.



13 2180

DIN 371	DIN 376	ISO 2X 6HX
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≤ M10 ≥ M12



13 2190

DIN 371	DIN 376	ISO 2X 6HX
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≤ M10 ≥ M12



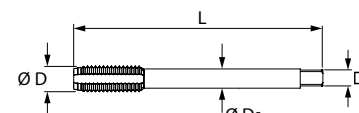
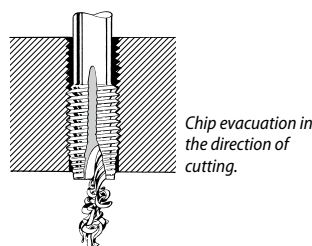
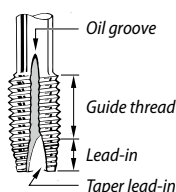
13 2193

DIN 371	DIN 376	ISO 3X 6GX
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≤ M10 ≥ M12



13 2195



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 2180–13 2193		28			23	23	12							11	9								
13 2195		20			16	16	8							7	6								

M	13 2180	13 2190	13 2193	13 2195	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap INOX machine tap								
	HSS-E-PM Form B 6HX	HSS-E-PM IC/ Form B 6HX	HSS-E-PM Form B 6GX	extra long HSS-E-PM Form B 6HX		13 2180 13 2190 13 2193	13 2195		
	TiAlN	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm
M1,6	eShop	—	—	—	0.35	40	—	2.5	1.25
M2	eShop	—	eShop	—	0.4	45	—	2.8	1.6
M2,5	eShop	—	—	—	0.45	50	—	2.8	2.05
M2,6	eShop	—	—	—	0.45	50	—	2.8	2.1
M3	eShop	—	eShop	eShop	0.5	56	112	3.5	2.5
M4	eShop	—	eShop	eShop	0.7	63	126	4.5	3.3
M5	eShop	—	eShop	eShop	0.8	70	140	6	4.2
M6	eShop	eShop	eShop	eShop	1	80	160	6	5
M8	eShop	eShop	eShop	eShop	1.25	90	180	8	6.8
M10	eShop	eShop	eShop	eShop	1.5	100	200	10	8.5
M12	eShop	eShop	eShop	eShop	1.75	110	220	9	10.2
M14	eShop	eShop	eShop	eShop	2	110	220	11	12
M16	eShop	eShop	eShop	eShop	2	110	220	12	14
M20	eShop	eShop	eShop	eShop	2.5	140	280	16	17.5
M24	eShop	—	eShop	eShop	3	160	300	18	21



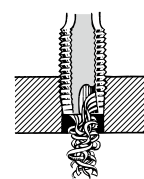
Garant Synchronised through hole machine taps

Sturdy design with spiral point and shank to DIN 1835-B. Special geometry for use on machines with **synchronised spindle drives**. The tap is controlled by the synchronising spindle of the machine. Special **TiAlN-S coating** for optimum tool life. For use with **emulsion** (fat content minimum 8%).

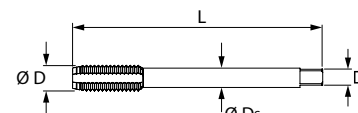
Note: For use on synchronised spindles, the **GARANT** quick-change tapping chuck **No. 338100 – 338121 with minimum length adjustment (MLA)** ensures maximum process reliability.



13 2280

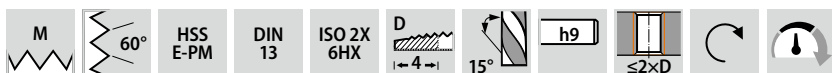


The spiral point evacuates the swarf in the cutting direction.



Suitable for/ v_c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si												INOX	INOX	Ti	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
	13 2780	40		37	35	22									12	10		35						

M	11H	13 2280	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap for synchronised spindles						
	HSS-E-PM						
	TiAlN						
M2,5		eShop	mm	mm	mm	mm	mm
M3		eShop	0.45	70	6	4.9	2.05
M4		eShop	0.5	70	6	4.9	2.5
M5		eShop	0.7	70	6	4.9	3.3
M6		eShop	0.8	70	6	4.9	4.2
M8		eShop	1	80	6	4.9	5
M10		eShop	1.25	90	8	6.2	6.8
M12		eShop	1.5	100	10	8	8.5
M16		eShop	1.75	110	12	9	10.2
		eShop	2	110	12	9	14



Garant Through hole machine tap with interrupted thread

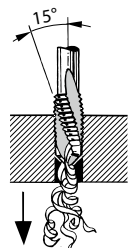
Sturdy design with 15° left-hand spiral. With interrupted thread, this **reduces torque** and improves distribution of the lubricant.

Particularly suitable for **titanium alloys** and **pure titanium**.

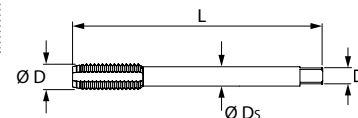
Advantage: Ideally suited for use on resilient materials and thin-walled components. Low frictional resistance, thus no material deformation is caused.



13 2400

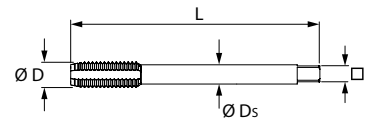
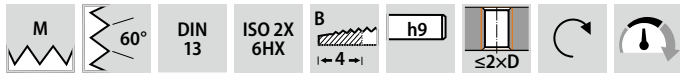


The left hand spiral evacuates the swarf in the cutting direction.



Suitable for/ v_c [m/min]	Alu plastics 	Alu cast > 10 % Si 												INOX	INOX	Ti	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N		●	●			
	13 2400	15	15			18	9	3								4							

M	11H	13 2400	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Through hole machine tap with interrupted thread						
	HSS-E-PM						
			mm	mm	mm	mm	mm
M2,5		eShop	0.45	50	2.8	2.1	2.05
M3		eShop	0.5	56	3.5	2.7	2.5
M4		eShop	0.7	63	4.5	3.4	3.3
M5		eShop	0.8	70	6	4.9	4.2
M6		eShop	1	80	6	4.9	5
M8		eShop	1.25	90	8	6.2	6.8
M10		eShop	1.5	100	10	8	8.5
M12		eShop	1.75	110	12	9	10.2
M16		eShop	2	110	12	9	14



Garant Through hole machine tap for Ti-based and Ni-based alloys

Strong spiral point. Guide section with oil grooves, but without chip flutes.

13 2450 – Particularly suitable for **difficult to machine steels up to 850 N/mm²**.

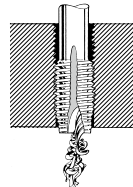
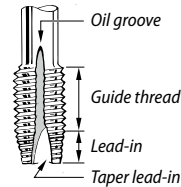
For use with **emulsion** (fat content minimum 8%).

Advantage: Particularly strong, optimum self-guidance and no recutting when reversed.



HSS E-PM
DIN 371
DIN 376
≤ M10 ≥ M14

13 2420



Chip clearance in the direction of cutting

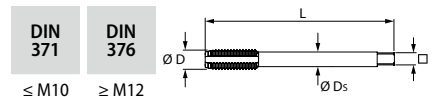
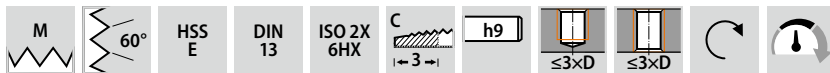


HSS E
DIN 371
DIN 376
≤ M10 ≥ M12

13 2450

Suitable for/ v _c [m/min]	Alu	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	Hybrid	INOX	INOX	Ti	Inconel	CuZn	MMC					
ISO code	N	N	N	N	N	N	N	N	N	P	P	P	M	M	S	S	N	N		
13 2420																				
13 2450	16									20	19	19	8	6	4	2	2	16		

M	13 2420	13 2450	Thread pitch	L	Ø D _s		□		Tapping hole Ø	M	13 2420	13 2450	Thread pitch	L	Ø D _s		□		Tapping hole Ø
	Machine tap																		
	HSS-E-PM	HSS-E			13 2420	13 2450	13 2420	13 2450			HSS-E-PM	HSS-E			13 2420	13 2450	13 2420	13 2450	
	nitrided + vaporised	TiCN									nitrided + vaporised	TiCN							
			mm	mm	mm	mm	mm	mm	mm				mm	mm	mm	mm	mm	mm	mm
M2	eShop	—	0.4	45	2.8	—	2.1	—	1.6	M10	eShop	eShop	1.5	100	10	10	8	8	8.5
M2,5	eShop	—	0.45	50	2.8	—	2.1	—	2.05	M12	eShop	eShop	1.75	110	12	9	9	7	10.2
M3	eShop	eShop	0.5	56	3.5	3.5	2.7	2.7	2.5	M14	eShop	—	2	110	11	—	9	—	12
M4	eShop	eShop	0.7	63	4.5	4.5	3.4	3.4	3.3	M16	eShop	eShop	2	110	12	12	9	9	14
M5	eShop	eShop	0.8	70	6	6	4.9	4.9	4.2	M20	eShop	eShop	2.5	140	16	16	12	12	17.5
M6	eShop	eShop	1	80	6	6	4.9	4.9	5	M24	eShop	eShop	3	160	18	18	14.5	14.5	21
M8	eShop	eShop	1.25	90	8	8	6.2	6.2	6.8										



Garant Through hole and blind hole machine tap for cast iron

With straight flutes and short chamfer lead (2 – 3 turns).

Advantage:

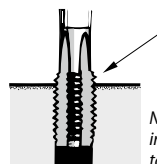
- 13 2550 – ■ **Improved wear properties** due to hard coating.
- **Higher cutting speeds** due to reduction of thermal load on cutting edges.
- **Dry machining possible** on cast iron – cooling lubricant not necessary.



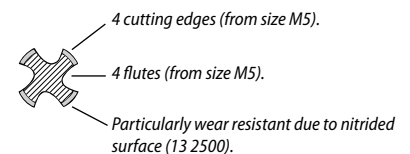
13 2500



13 2550



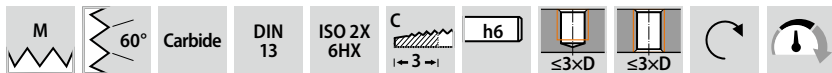
Nitrided surface – the abrasive cast iron material would heavily abrade taps which were not nitrided.



Particularly wear resistant due to nitrided surface (13 2500).

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG	GGG					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	K					
13 2500																13	9		●		○	
13 2550																16	14		●		○	

M	13 2500	13 2550	Thread pitch	L	Ø D _s	□	Tapping hole Ø	M	13 2500	13 2550	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap for cast iron							Machine tap for cast iron							
	nitrided	TiCN	mm	mm	mm	mm	mm	nitrided	TiCN	mm	mm	mm	mm	mm	mm
M2	eShop	eShop	0.4	45	2.8	2.1	1.6	M10	eShop	eShop	1.5	100	10	8	8.5
M3	eShop	eShop	0.5	56	3.5	2.7	2.5	M12	eShop	eShop	1.75	110	9	7	10.2
M4	eShop	eShop	0.7	63	4.5	3.4	3.3	M14	eShop	eShop	2	110	11	9	12
M5	eShop	eShop	0.8	70	6	4.9	4.2	M16	eShop	eShop	2	110	12	9	14
M6	eShop	eShop	1	80	6	4.9	5	M18	eShop	—	2.5	125	14	11	15.5
M8	eShop	eShop	1.25	90	8	6.2	6.8	M20	eShop	eShop	2.5	140	16	12	17.5



DIN 371	DIN 376
≤ M10	≤ M12

Garant Carbide through and blind hole machine tap

Very sturdy, with short chamfer lead (2 – 3 turns).

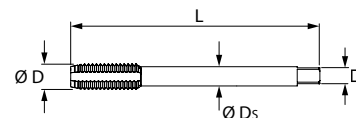
Size M3–M10 – **Solid carbide version.**

Size M12; M16 – **Carbide inserts.**

Advantage: Optimum self-guidance.



13 2570



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	> 850 N	GG(G)	CuZn				
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N				
13 2570																	16	20		●	○	

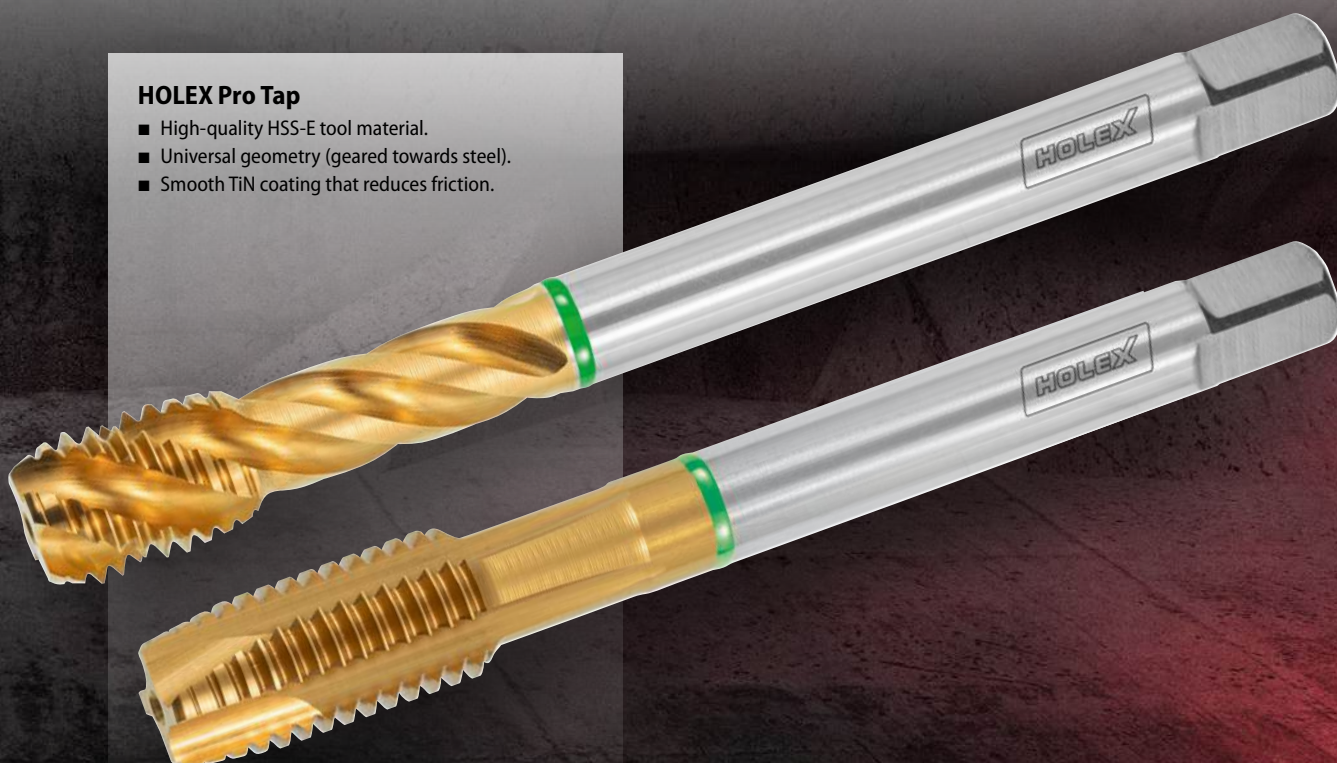
M	13 2570	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Carbide machine tap	mm	mm	mm	mm	mm
M3	eShop	0.5	56	3.5	2.7	2.5
M4	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	0.8	70	6	4.9	4.2
M6	eShop	1	80	6	4.9	5
M8	eShop	1.25	90	8	6.2	6.8
M10	eShop	1.5	100	10	8	8.5
M12	eShop	1.75	110	9	7	10.2
M16	eShop	2	110	12	9	14

HOLEX

ROBUST TAP FOR A WIDE RANGE OF APPLICATIONS.

HOLEX Pro Tap

- High-quality HSS-E tool material.
- Universal geometry (geared towards steel).
- Smooth TiN coating that reduces friction.



13



Through hole machine tap

13 2643 – Shank to **DIN 376** (shank Ø relieved); thus suitable for greater operating depths.

13 2680 – **HOLEX Pro Tap general-purpose tap.**

Sturdy design suitable for a wide spectrum of materials.

Improved HSS-E tool material with low-friction TiN coating.

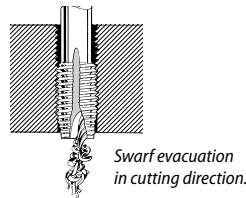
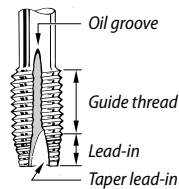
13 2642/2643 – **GARANT Vap Tap general-purpose tap.**

Can be used **reliably** in a **wide range of materials.**

Optimised **neck and flute length** for **improved chip evacuation** when working on **deep threads.**

High-performance **HSS-E tool material** with higher vanadium content for improved **wear resistance.**

Surface vaporised for reduced edge build-up.



DIN 371
≤ M10

DIN 376
≥ M12

13 2642



DIN 376
≥ M12

13 2643



DIN 371
≤ M10

DIN 376
≥ M12

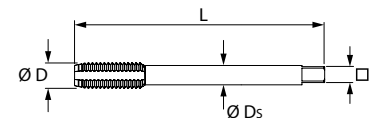
13 2645



DIN 371
≤ M10

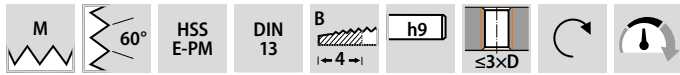
DIN 376
≥ M12

13 2680



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 2642/2643	18	13		18	15	15	6							6			15	●	●	●			
13 2645		11		12	8	7	4							4			12	●	●	●			
13 2680	24	25	10	24	20	15	8							8			15	●	●	●			

M	13V 13 2642	13V 13 2643	12H 13 2645	12I 13 2680	Thread pitch	L	Ø D _s		□		Tapping hole Ø
	Garant		HOLEX								
	GARANT Vap Tap machine tap		Machine tap								
	HSS-E	HSS-E DIN 376	HSS-E	HSS-E			13 2642 13 2645 13 2680	13 2643	13 2642 13 2645 13 2680	13 2643	
	vaporised	vaporised	vaporised	TiN	mm	mm	mm	mm	mm	mm	mm
M1,6	eShop	—	—	—	0.35	40	2.5	—	2.1	—	1.25
M1,7	eShop	—	—	—	0.35	40	2.5	—	2.1	—	1.3
M1,8	eShop	—	—	—	0.35	40	2.5	—	2.1	—	1.45
M2	eShop	—	—	eShop	0.4	45	2.8	—	2.1	—	1.6
M2,2	eShop	—	—	—	0.45	45	2.8	—	2.1	—	1.75
M2,3	eShop	—	—	—	0.4	45	2.8	—	2.1	—	1.9
M2,5	eShop	—	—	eShop	0.45	50	2.8	—	2.1	—	2.05
M3	eShop	eShop	eShop	eShop	0.5	56	3.5	2.2	2.7	—	2.5
M3,5	eShop	—	—	—	0.6	56	4	—	3	—	2.9
M4	eShop	eShop	eShop	eShop	0.7	63	4.5	2.8	3.4	2.1	3.3
M5	eShop	eShop	eShop	eShop	0.8	70	6	3.5	4.9	2.7	4.2
M6	eShop	eShop	eShop	eShop	1	80	6	4.5	4.9	3.4	5
M7	eShop	—	—	—	1	80	7	—	5.5	—	6
M8	eShop	eShop	eShop	eShop	1.25	90	8	6	6.2	4.9	6.8
M10	eShop	eShop	eShop	eShop	1.5	100	10	7	8	5.5	8.5
M12	eShop	—	eShop	eShop	1.75	110	9	—	7	—	10.2
M14	eShop	—	eShop	eShop	2	110	11	—	9	—	12
M16	eShop	—	eShop	eShop	2	110	12	—	9	—	14
M18	eShop	—	—	—	2.5	125	14	—	11	—	15.5
M20	eShop	—	eShop	eShop	2.5	140	16	—	12	—	17.5
M22	eShop	—	—	—	2.5	140	18	—	14.5	—	19.5
M24	eShop	—	eShop	eShop	3	160	18	—	14.5	—	21
M27	eShop	—	—	—	3	160	20	—	16	—	24
M30	eShop	—	—	eShop	3.5	180	22	—	18	—	26.5
M33	eShop	—	—	—	3.5	180	25	—	20	—	29.5
M36	eShop	—	—	—	4	200	28	—	22	—	32



GARANT Master Tap through hole machine tap

Universal taps, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for a high degree of wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

13 2723 – **With internal coolant feed.**

13 2726 Size M3 – **Without square.**

13 2726 – **All sizes: shank to DIN 376 (= shank Ø relieved);**
thus suitable for greater operating depths.

13 2721 Size M1–M1,4 – Corresponds to **ISO 1X/4HX.**

13 2721 Size M1,6–M30 – Corresponds to **ISO 2X/6HX.**



DIN 371	DIN 376	ISO 1X 4HX	ISO 2X 6HX
≤ M10	≥ M12	≤ M1.4	≥ M1.6

13 2721



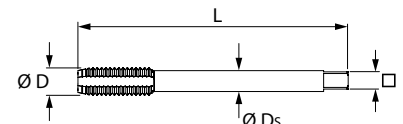
DIN 376	ISO 2X 6HX
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13 2726



DIN 371	DIN 376	ISO 2X 6HX
≤ M10	≥ M12	

13 2723



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
13 2721–13 2726	30	35	20	30	30	25	12	8						10	8	20	20	●	●	●	●	●	●

M	13 2721	13 2726	13 2723	Thread pitch	L	Ø D _s		□		Tapping hole Ø
	GARANT Master Tap machine tap					13 2721 13 2723	13 2726	13 2721 13 2723	13 2726	
	Form B	Form B 6HX DIN 376	IC / Form B 6HX							
	AITiX	AITiX	AITiX							
M1	eShop	—	—	mm	mm	mm	mm	mm	mm	
M1,1	eShop	—	—	0.25	40	2.5	—	2.1	—	0.75
M1,2	eShop	—	—	0.25	40	2.5	—	2.1	—	0.85
M1,4	eShop	—	—	0.25	40	2.5	—	2.1	—	0.95
M1,6	eShop	—	—	0.3	40	2.5	—	2.1	—	1.1
M1,7	eShop	—	—	0.35	40	2.5	—	2.1	—	1.25
M1,8	eShop	—	—	0.35	40	2.5	—	2.1	—	1.35
M2	eShop	—	—	0.35	40	2.5	—	2.1	—	1.45
M2,2	eShop	—	—	0.4	45	2.8	—	2.1	—	1.6
M2,3	eShop	—	—	0.45	45	2.8	—	2.1	—	1.75
M2,5	eShop	—	—	0.4	45	2.8	—	2.1	—	1.9
M2,6	eShop	—	—	0.45	50	2.8	—	2.1	—	2.05
M3	eShop	eShop	—	0.45	50	2.8	—	2.1	—	2.15
M3,5	eShop	—	—	0.5	56	3.5	2.2	2.7	—	2.5
M4	eShop	eShop	—	0.6	56	4	—	3	—	2.9
M4,5	eShop	—	—	0.7	63	4.5	2.8	3.4	2.1	3.3
M5	eShop	eShop	—	0.75	70	6	—	4.9	—	3.7
M6	eShop	eShop	—	0.8	70	6	3.5	4.9	2.7	4.2
M7	eShop	eShop	eShop	1	80	6	4.5	4.9	3.4	5
M8	eShop	—	—	1	80	7	—	5.5	—	6
M10	eShop	eShop	eShop	1.25	90	8	6	6.2	4.9	6.8
M12	eShop	eShop	eShop	1.5	100	10	7	8	5.5	8.5
M14	eShop	—	eShop	1.75	110	9	—	7	—	10.2
M16	eShop	—	eShop	2	110	11	—	9	—	12
M18	eShop	—	eShop	2	110	12	—	9	—	14
M20	eShop	—	—	2.5	125	14	—	11	—	15.5
M22	eShop	—	eShop	2.5	140	16	—	12	—	17.5
M24	eShop	—	—	2.5	140	18	—	14.5	—	19.5
M27	eShop	—	—	3	160	18	—	14.5	—	21
M30	eShop	—	—	3	160	20	—	16	—	24
	eShop	—	—	3.5	180	22	—	18	—	26.5





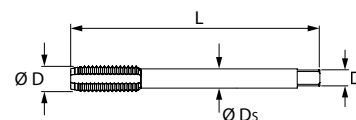
GARANT Master Tap Alu through hole machine tap

High-performance tap, specially developed for **aluminium and non-ferrous alloys**. Extra long flutes and neck length for usable **thread depths up to 4xD**.

- **HSS-E-PM tool material** for high cutting edge stability.
- Ultra-smooth **DLC coating** for wear resistance and avoidance of edge build-up.
- **Extra long flute geometry**.



13 2810



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30								
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
13 2810	35	32	20	20		18	18										18	25					

MF	13 2810	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap Alu machine tap				
	DLC	mm	mm	mm	mm
4x0,5	eShop	63	2.8	2.1	3.5
5x0,5	eShop	70	3.5	2.7	4.5
6x0,5	eShop	80	4.5	3.4	5.5
6x0,75	eShop	80	4.5	3.4	5.2
8x0,75	eShop	80	6	4.9	7.2
8x1	eShop	90	6	4.9	7
10x1	eShop	100	7	5.5	9
12x1	eShop	110	9	7	11
12x1,5	eShop	110	9	7	10.5
14x1,5	eShop	125	11	9	12.5
16x1,5	eShop	130	12	9	14.5

13

HOLEX

THE CLEVER DUO

Clever Drill
No. 11 4031



Clever Tap
No. 13 5255

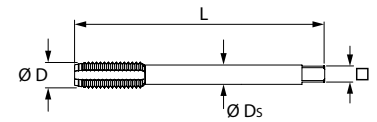
Outstanding quality:

- At an excellent price-performance ratio.
- With a broad product range for most standard applications.
- Practical geometry and clever design.



Even better – together in the convenient case.

For the blind hole application No. 14 6924.
For the through hole application No. 14 6724.



Through hole machine tap

With spiral point.

13 2835 – (Form CS) 2 – 3 – start chamfer lead – with spiral point.

TiN coated.

Can be used with **soluble coolant** (fat content min. 8 %).

13 2845 – **HOLEX Clever Tap:**

Sturdy tap for conventional standard applications.

High-quality HSS-E tool material and geometry for steels.

Surface: Bronze-coloured tempered thread profile.



13 2830



13 2835



13 2845

Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
13 2830			13		15	15													●	○			
13 2835			28		27	23	17	7											●	○			
13 2845		13	13		12	12	6												●	○			

MF	13 2830	13 2835	13 2845	L	$\varnothing D_s$	$\square$	Tapping hole $\varnothing$
	Garant		HOLEX				
	Machine tap		HOLEX Clever Tap machine tap				
	HSS-E Form B	HSS-E-PM Form CS TiN	HSS-E Form B	mm	mm	mm	mm
2x0,25	eShop	—	—	45	1.4	—	1.75
2,5x0,35	eShop	—	—	50	1.8	—	2.15
3x0,35	eShop	—	—	56	2.2	—	2.65
4x0,35	eShop	—	—	63	2.8	2.1	3.65
4x0,5	eShop	—	—	63	2.8	2.1	3.5
5x0,5	eShop	eShop	eShop	70	3.5	2.7	4.5
6x0,5	eShop	—	eShop	80	4.5	3.4	5.5
6x0,75	eShop	eShop	eShop	80	4.5	3.4	5.2
7x0,75	eShop	—	—	80	5.5	4.3	6.2
8x0,5	eShop	—	eShop	80	6	4.9	7.5
8x0,75	eShop	eShop	eShop	80	6	4.9	7.2
8x1	eShop	eShop	eShop	90	6	4.9	7
9x1	eShop	—	—	90	7	5.5	8
10x0,75	eShop	—	—	90	7	5.5	9.2
10x1	eShop	eShop	eShop	90	7	5.5	9
10x1,25	eShop	eShop	eShop	100	7	5.5	8.8
11x1	eShop	—	—	90	8	6.2	10
12x1	eShop	eShop	eShop	100	9	7	11
12x1,25	eShop	eShop	eShop	100	9	7	10.8
12x1,5	eShop	eShop	eShop	100	9	7	10.5
14x1	eShop	—	eShop	100	11	9	13
14x1,25	eShop	—	eShop	100	11	9	12.8
14x1,5	eShop	eShop	eShop	100	11	9	12.5
15x1	eShop	—	—	100	12	9	14
15x1,5	eShop	—	—	100	12	9	13.5
16x1	eShop	—	eShop	100	12	9	15
16x1,5	eShop	eShop	eShop	100	12	9	14.5
18x1	eShop	—	eShop	110	14	11	17
18x1,5	eShop	eShop	eShop	110	14	11	16.5
18x2	eShop	—	—	125	14	11	16
20x1	eShop	—	—	125	16	12	19
20x1,5	eShop	eShop	eShop	125	16	12	18.5
22x1	eShop	—	—	125	18	14.5	21
22x1,5	eShop	eShop	eShop	125	18	14.5	20.5
22x2	eShop	—	—	140	18	14.5	20
24x1	eShop	—	—	140	18	14.5	23
24x1,5	eShop	eShop	eShop	140	18	14.5	22.5
25x1,5	eShop	—	eShop	140	18	14.5	23.5
26x1,5	eShop	—	—	140	18	14.5	24.5
27x1,5	eShop	—	—	140	20	16	25.5
27x2	eShop	—	—	140	20	16	25
30x1	eShop	—	—	150	22	18	29
30x1,5	eShop	—	—	150	22	18	28.5
30x2	eShop	—	—	150	22	18	28
32x1,5	eShop	—	—	150	22	18	30.5
33x1,5	eShop	—	—	160	25	20	31.5
33x2	eShop	—	—	160	25	20	31
35x1,5	eShop	—	—	170	28	22	33.5
36x1,5	eShop	—	—	170	28	22	34.5
36x2	eShop	—	—	170	28	22	34
38x1,5	eShop	—	—	170	28	22	36.5
40x1,5	eShop	—	—	170	32	24	38.5
50x1,5	eShop	—	—	190	36	29	48.5
63x1,5	eShop	—	—	220	45	35	61.5



GARANT Master Tap Steel^{HT} through hole machine tap

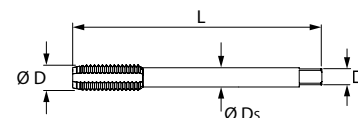
High-performance tap, specially developed for use in **steels with high tensile strength** and for **difficult-to-machine materials**. **Strong spiral point**, for process stability at high cutting forces.

- **HSS-E-PM tool material** – for **very high cutting edge stability**.
- **Optimised honed cutting edges**.
- **TiCN coating** – for **maximum wear protection**.

Recommendation: For **TOOLOX** and **HARDOX** materials we recommend **deviating from the DIN data** (see table) by selecting a larger tapping hole $\varnothing$.

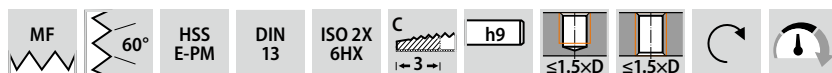


13 2855



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	TOOLOX 33 HRC	TOOLOX 44 HRC	HARDOX 500 < 1600 N	INOX > 900 N	Ti > 850 N					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	H	M	S					
13 2855					30	20	15	12	5						15	5	3	7	5					

MF	13 2855	L	Ø D _s	□	Tapping hole Ø	MF	13 2855	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap Steel ^{HT} machine tap						GARANT Master Tap Steel ^{HT} machine tap				
	HSS-E-PM Form B 6HX						HSS-E-PM Form B 6HX				
	TiCN	mm	mm	mm	mm		TiCN	mm	mm	mm	mm
3×0,35	eShop	56	2.2	—	2.65	12×1,25	eShop	100	9	7	10.8
4×0,5	eShop	63	2.8	2.1	3.5	12×1,5	eShop	100	9	7	10.5
5×0,5	eShop	70	3.5	2.7	4.5	14×1,5	eShop	100	11	9	12.5
6×0,5	eShop	80	4.5	3.4	5.5	16×1,5	eShop	100	12	9	14.5
6×0,75	eShop	80	4.5	3.4	5.2	18×1,5	eShop	110	14	11	16.5
8×0,75	eShop	80	6	4.9	7.2	20×1,5	eShop	125	16	12	18.5
8×1	eShop	90	6	4.9	7	24×1,5	eShop	140	18	14.5	22.5
10×1	eShop	90	7	5.5	9	26×1,5	eShop	140	18	14.5	24.5
10×1,25	eShop	100	7	5.5	8.8	30×1,5	eShop	150	22	18	28.5
12×1	eShop	100	9	7	11						



GARANT Through and blind hole machine taps

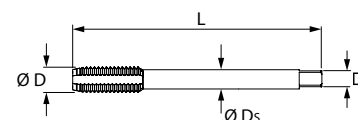
DIN 371
DIN 374
≤ 10×1 ≥ 12×1,5

Sturdy version.

Recommendation: For **very hard steels**, **TOOLOX** and **HARDOX** materials we recommend **deviating from the DIN data** (see table) by **drilling the core hole $\varnothing$ 0.05 to 0.3 mm larger**. For use only with a length compensation chuck – even on machines with synchronised spindle drives.



13 2861



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	ISO 2X 6HX	TOOLOX 33 HRC	TOOLOX 44 HRC	HARDOX 500 < 1600 N	INOX < 900 N	Graphite					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	H	M	N					
13 2861									12	7	2				4	3	2		15					

MF	13 2861	L	Ø D _s	□	Tapping hole Ø
	Machine tap				
	TiCN	mm	mm	mm	mm
8×1	eShop	90	8	6.2	7
10×1	eShop	90	10	8	9
12×1,5	eShop	100	9	7	10.5
14×1,5	eShop	100	11	9	12.5
16×1,5	eShop	100	12	9	14.5



Garant Solid carbide machine tap for through and blind holes

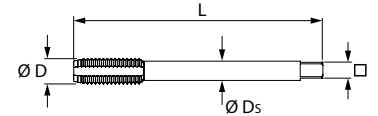
Particularly sturdy version. For the highest performance demands.

Recommendation: For **very hard steels, TOOLOX** and **HARDOX** materials we recommend **deviating from the DIN data** (see table) by drilling the tapping hole $\varnothing 0.05$ to **0.3mm** larger.

For use only with a length compensation chuck – even on machines with synchronised spindle drives.

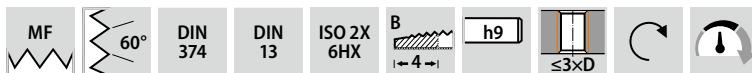


13 2862



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si 											TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	HARDOX [®] 500 < 1600 N	INOX < 900 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	M	N					
13 2862									3	2	1	1		5	4	3		18					

MF	11H	13 2862	L	∅ D _s		Tapping hole ∅
		Solid carbide machine tap				
		TiAlN	mm	mm	mm	mm
8×1		eShop	90	8	6.2	7
10×1		eShop	100	10	8	9
12×1,5		eShop	110	12	9	10.5



Garant Through hole machine tap for stainless steels

13 2870 – **Strong spiral point.**

Guide section **with oil grooves**.

13 2875 – **GARANT Master Tap INOX:**

Powerful tap, specially developed for **tapping to high process reliability in stainless and acid-resistant steels** and also **duplex materials**.

- **HSS-E-PM tool material** for maximum wear resistance
- The latest generation of **TiAlN multi-layer coating**
- **Parameterised flute geometry** for optimum chip formation and **torsional rigidity**

HSS E

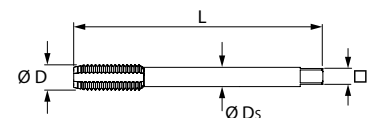


13 2870

HSS E-PM

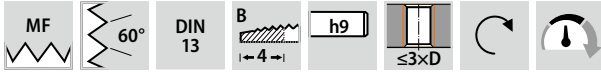


13 2875



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10% Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
13 2870		13		15	15	15								6			13		●	●			
13 2875		28			23	23	12							11	9				●	●			

MF	11H	13 2870	11H	13 2875	L	∅ D _s	□	Tapping hole ∅
		Machine tap		GARANT Master Tap INOX machine tap				
		HSS-E		HSS-E-PM				
		vapourised		TiAlN				
		eShop		eShop	mm	mm	mm	mm
4x0,5					63	2.8	2.1	3.5



Through hole machine tap

13 2906 – **Tolerance class ISO3X/6GX.** For components which are **galvanised** or shrink slightly when hardened.

13 2907 – With extra-long shank

13 2925 – **HOLEX Pro Tap general-purpose tap.**

Sturdy design suitable for a wide spectrum of materials.

Improved HSS-E tool material with low-friction TiN coating.

13 2905–2907 – **GARANT Master Tap Universal taps,**

designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for maximum wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

Advantage:

13 2907 – Designed for tapping threads where access is difficult.



HSS E-PM DIN 374 ISO 2X 6HX

13 2905



HSS E-PM DIN 374 ISO 3X 6GX

13 2906



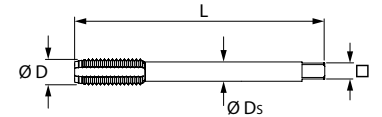
HSS E-PM Standard ISO 2X 6HX

13 2907



HSS E DIN 374 ISO 2 6H

13 2925

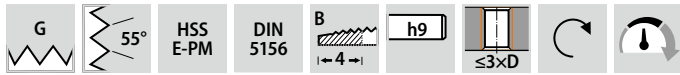


Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
13 2905/2906	30	35	20	30	30	25	12	8						10	8	20	20	●	●	●	●	●	●
13 2907	24	28	16	24	24	20	10	6						8	6	16	16	●	●	●	●	●	●
13 2925	24	25	10	24	20	15	8							8			15	●	●	●	●	●	●

MF	13 2905	13 2906	13 2907	13 2925	L	Ø D _s	□	Tapping hole Ø
	Garant			HOLEX				
	GARANT Master Tap machine tap			HOLEX Pro Tap machine tap				
	HSS-E-PM 6HX	HSS-E-PM 6GX	extra long HSS-E-PM 6HX	HSS-E 6H	13 2905 13 2906 13 2925	13 2907		
	AITiX	AITiX	AITiX	TiN	mm	mm	mm	mm
2,5×0,35	eShop	—	—	—	50	—	1.8	2.15
2,6×0,35	eShop	—	—	—	50	—	1.8	2.25
3×0,35	eShop	—	—	eShop	56	—	2.2	2.65
3,5×0,35	eShop	—	—	—	56	—	2.2	3.15
4×0,35	eShop	—	—	—	63	—	2.8	3.65
4×0,5	eShop	—	—	eShop	63	—	2.8	3.5
4,5×0,5	eShop	—	—	—	70	—	3.5	4
5×0,5	eShop	eShop	—	eShop	70	—	3.5	4.5
6×0,5	eShop	—	—	eShop	80	—	4.5	5.5
6×0,75	eShop	eShop	—	eShop	80	—	4.5	5.2
6,5×0,75	eShop	—	—	—	80	—	5.5	5.8
7×0,5	eShop	—	—	—	80	—	5.5	6.5
8×0,75	eShop	—	—	eShop	80	—	6	7.2
8×1	eShop	eShop	eShop	eShop	90	180	6	7
9×1	eShop	—	—	—	90	—	6	8
10×0,75	eShop	—	—	—	90	—	7	9.25
10×1	eShop	eShop	eShop	eShop	90	180	7	9
10×1,25	eShop	—	eShop	eShop	100	200	7	8.8
11×1	eShop	—	—	—	90	—	8	10
12×0,5	eShop	—	—	—	100	—	9	11.5
12×0,75	eShop	—	—	—	100	—	9	11.25
12×1	eShop	eShop	—	eShop	100	—	9	11
12×1,25	eShop	—	eShop	eShop	100	200	9	10.8
12×1,5	eShop	eShop	eShop	eShop	100	200	9	10.5
13×1	eShop	—	—	—	100	—	11	12
14×1,5	eShop	eShop	—	eShop	100	—	11	12.5
16×1,5	eShop	eShop	eShop	eShop	100	200	12	14.5
18×1	eShop	—	—	—	110	—	14	17
18×1,5	eShop	—	—	eShop	110	—	14	16.5
20×1,5	eShop	—	eShop	eShop	125	250	16	18.5
20×2	eShop	—	—	—	140	—	16	18
22×1,5	eShop	—	—	eShop	125	—	18	20.5
24×1,5	eShop	—	—	eShop	140	—	18	22.5
24×2	eShop	—	—	—	140	—	18	22
26×1,5	eShop	—	—	eShop	140	—	18	24.5
30×1,5	eShop	—	—	eShop	150	—	22	28.5



13

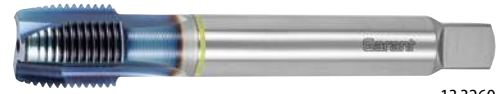


GARANT Master Tap Alu through hole machine tap

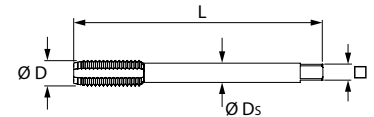
High-performance tap, specially developed for **aluminium and non-ferrous alloys**.

- **HSS-E-PM cutting medium** for high cutting edge stability.
- Ultra-smooth **DLC coating** for wear resistance and preventing galling.

Application: For Whitworth parallel pipe threads DIN-ISO 228/1 (threads that do not form a seal within the connection).

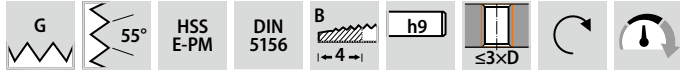


13 3260



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
13 3260	35	32	20	20		18	18										18	25					

G	13 3260	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap Alu machine tap						
	DLC		mm	mm	mm	mm	mm
G1/8	eShop	28	9.73	90	7	5.5	8.8
G1/4	eShop	19	13.16	100	11	9	11.8
G3/8	eShop	19	16.66	100	12	9	15.25
G1/2	eShop	14	20.96	125	16	12	19
G3/4	eShop	14	26.44	140	20	16	24.5
G1	eShop	11	33.25	160	25	20	30.75



GARANT Master Tap Steel^{HT} through hole machine tap

High-performance tap, specially developed for use in **steels with high tensile strength** and for **difficult-to-machine materials**. **Strong spiral point**, for process stability at high cutting forces.

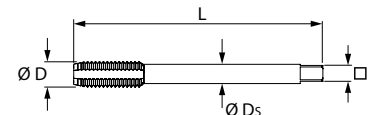
- **HSS-E-PM tool material** – for very high cutting edge stability.
- **Optimised honed cutting edges**.
- **TiCN coating** – for maximum wear protection.

Application: For Whitworth parallel pipe threads DIN-ISO 228/1 (threads that do not form a seal within the connection).

Recommendation: For **TOOLOX** and **HARDOX** materials we recommend deviating from the DIN data (see table) by selecting a larger tapping hole diameter.



13 3312

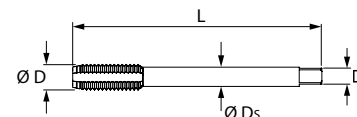


Suitable for/ v_c [m/min]	Alu	Alu	Alu																				
	Alu	Alu	Alu																				
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	H	M	S				
13 3312					30	20	15	12	5														

G	13 3312	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap Steel ^{HT} machine tap						
	HSS-E-PM Form B						
	TiCN		mm	mm	mm	mm	mm
G1/8	eShop	28	9.73	90	7	5.5	8.8
G1/4	eShop	19	13.16	100	11	9	11.8
G3/8	eShop	19	16.66	100	12	9	15.25
G1/2	eShop	14	20.96	125	16	12	19
G3/4	eShop	14	26.44	140	20	16	24.5
G1	eShop	11	33.25	160	25	20	30.75



13 3320



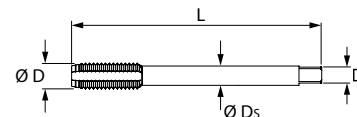
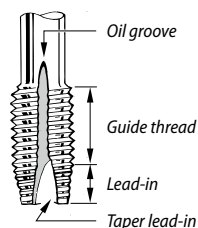
Suitable for/ v_c [m/min]	Alu plastics 	Alu cast > 10% Si 											TOOLOX® 33 HRC	TOOLOX® 44 HRC	HARDOX® 500 < 1600 N	INOX < 900 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	N					
	13 3320								3	2	1	1	5	4	3		18					

G	11H	13 3320	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	Solid carbide machine tap							
	TiAlN							
G1/8		eShop	28	9.73	100	10	8	8.8
G1/4		eShop	19	13.16	110	14	11	11.8



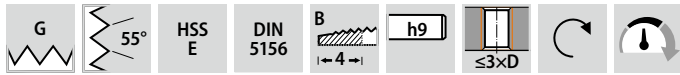
13 3325

HSS E	HSS
$\leq 5/8"$	$\geq 3/4"$

HSS
E-PM

Suitable for/ v _c [m/min]	Alu plastics ø222	Alu cast to 10% Si	Alu cast < 500 N										INOX	INOX	Ti	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	N	CRP					
13 3325		13		15	15	15							6									
13 3327		28			23	23	12						11	9		13		●	●			

G	1H	13 3325	1H	13 3327	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	Machine tap		GARANT Master Tap INOX machine tap							
	HSS-E		HSS-E-PM							
	vaporised		TiAlN							
G1/8	eShop		eShop		28	9.73	90	7	5.5	8.8
G1/4	eShop		eShop		19	13.16	100	11	9	11.8
G3/8	eShop		eShop		19	16.66	100	12	9	15.25
G1/2	eShop		eShop		14	20.96	125	16	12	19
G5/8	eShop		eShop		14	22.91	125	18	14.5	21
G3/4	eShop		eShop		14	26.44	140	20	16	24.5
G1	eShop		eShop		11	33.25	160	25	20	30.75



GARANT Vap Tap through hole machine tap

Can be used reliably in a wide range of materials.

Optimised **neck and flute length** for improved **chip evacuation** when working on **deep threads**.

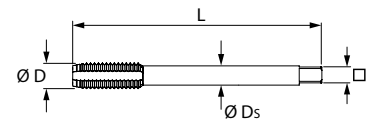
High-performance **HSS-E tool material** with higher vanadium content for improved **wear resistance**.

Surface vaporised for reduced edge build-up.

Application: For Whitworth parallel pipe threads DIN-ISO 228/1 (threads that do not form a seal within the connection).



13 3328_G1/4



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	CuZn	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N							
13 3328	18	13		18	15	15	6							6			15	●	●	●				

G	13V	13 3328	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
		GARANT Vap Tap machine tap						
		vaporised		mm	mm	mm	mm	mm
G1/8		eShop	28	9.73	90	7	5.5	8.8
G1/4		eShop	19	13.16	100	11	9	11.8
G3/8		eShop	19	16.66	100	12	9	15.25
G1/2		eShop	14	20.96	125	16	12	19
G3/4		eShop	14	26.44	140	20	16	24.5
G1		eShop	11	33.25	160	25	20	30.75

GARANT Master Tap INOX

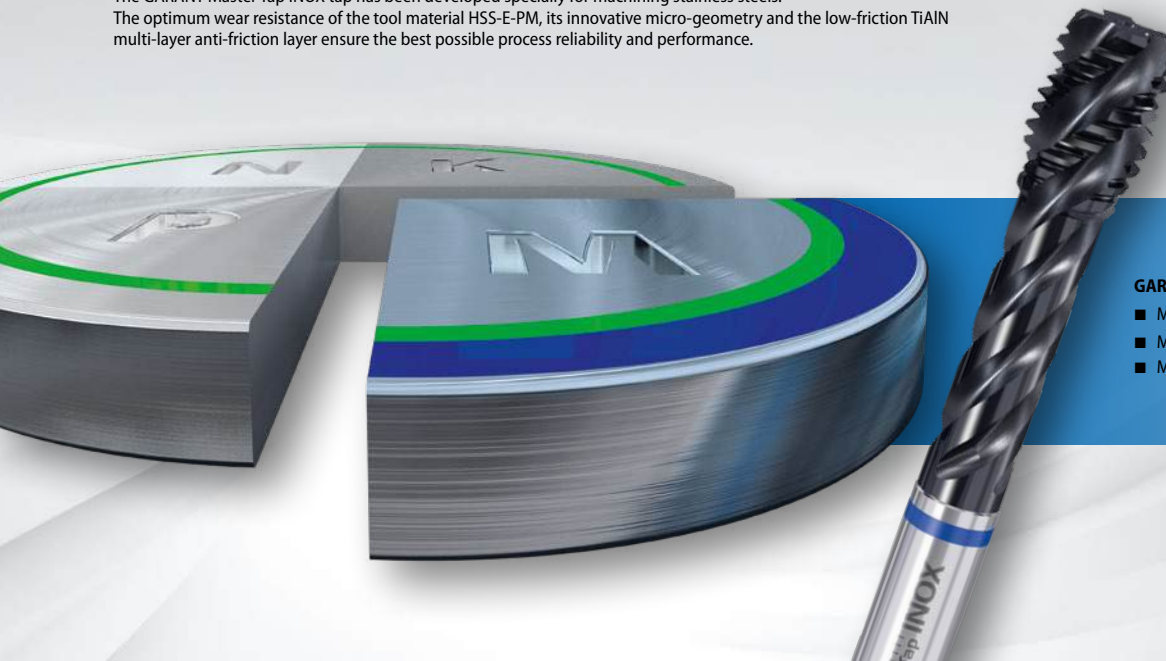


Absolute process reliability in particularly challenging VA stainless steel grades

The GARANT Master Tap INOX tap has been developed specially for machining stainless steels.

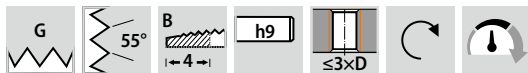
The optimum wear resistance of the tool material HSS-E-PM, its innovative micro-geometry and the low-friction TiAlN multi-layer anti-friction layer ensure the best possible process reliability and performance.

GARANT MASTER TAP INOX



GARANT Master Tap INOX – the specialist.

- Maximum tool life.
- Maximum process reliability.
- Maximum performance.



Through hole machine tap

13 3332 – **HOLEX Pro Tap general-purpose tap**. Sturdy design suitable for a wide spectrum of materials. **Improved HSS-E tool material with low-friction TiN coating.**

13 3333 – With extra-long shank

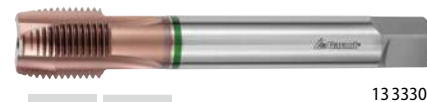
13 3330/3333 – **GARANT Master Tap Universal taps**, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for maximum wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

Advantage:

13 3333 – Designed for tapping threads where access is difficult.

Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connection).



HSS
E-PM

DIN
5156

13 3330



HSS
E-PM

Standard

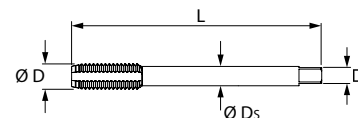
13 3333



HSS
E

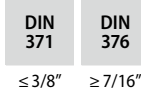
DIN
5156

13 3332



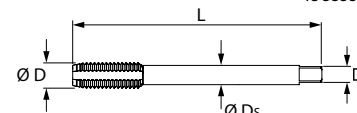
Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	St < 500 N	St < 750 N	St < 900 N	St < 1100 N	St < 1400 N	St < 55 HRC	St < 60 HRC	St < 65 HRC	St < 67 HRC	St < 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni	Cast iron	Stainless steel	Aluminum	Brass	Copper	Titanium
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N							
13 3330	30	35	20	30	30	25	12	8						10	8	20	20	•	•	•	•	•	•	•
13 3332	24	25	10	24	20	15	8							8	8	15	15	•	•	•	•	•	•	•
13 3333	24	28	16	24	24	20	10	6						8	6	16	20	•	•	•	•	•	•	•

G	13 3330	13 3333	13 3332	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	Garant		HOLEX						
	GARANT Master Tap machine tap		HOLEX Pro Tap machine tap						
	HSS-E-PM	extra long HSS-E-PM	HSS-E			13 3330 13 3332	13 3333		
	AITIX	AITIX	TiN		mm	mm	mm	mm	mm
G1/16	eShop	—	—	28	7.72	90	—	6	4.9
G1/8	eShop	eShop	eShop	28	9.73	90	180	7	5.5
G1/4	eShop	eShop	eShop	19	13.16	100	200	11	9
G3/8	eShop	eShop	eShop	19	16.66	100	200	12	9
G1/2	eShop	eShop	eShop	14	20.96	125	250	16	12
G5/8	eShop	—	eShop	14	22.91	125	—	18	14.5
G3/4	eShop	eShop	eShop	14	26.44	140	280	20	16
G1	eShop	eShop	eShop	11	33.25	160	280	25	20

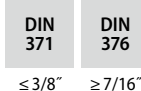


13 3353 – **HOLEX** Clever Tap:

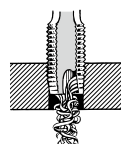
Application: For UNC uniform coarse threads ASME – B1.1.

[illegible]

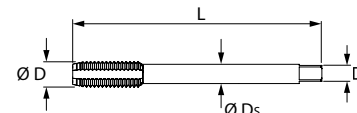
UNC	11H	13 3350	12H	13 3353	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
										
		Machine tap		HOLEX Clever Tap machine tap						
						mm	mm	mm	mm	mm
4-40		eShop		eShop	40	2.84	56	3.5	2.7	2.35
5-40		eShop		—	40	3.17	56	3.5	2.7	2.65
6-32		eShop		eShop	32	3.51	56	4	3	2.85
8-32		eShop		eShop	32	4.16	63	4.5	3.4	3.5
10-24		eShop		eShop	24	4.83	70	6	4.9	3.9
12-24		eShop		—	24	5.49	80	6	4.9	4.5
1/4-20		eShop		eShop	20	6.35	80	7	5.5	5.1
5/16-18		eShop		eShop	18	7.94	90	8	6.2	6.6
3/8-16		eShop		eShop	16	9.53	100	9	7	8
7/16-14		eShop		eShop	14	11.11	100	8	6.2	9.4
1/2-13		eShop		eShop	13	12.7	110	9	7	10.8
5/8-11		eShop		eShop	11	15.88	110	12	9	13.5
3/4-10		eShop		eShop	10	19.05	125	14	11	16.5
7/8-9		eShop		—	9	22.23	140	18	14.5	19.5
1-8		eShop		—	8	25.4	160	20	16	22.25



Application: For UNC uniform coarse threads ASME – B1.1.

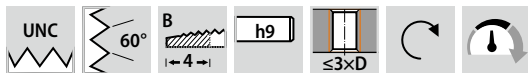


*The spiral point
evacuates the swarf
in the cutting
direction.*



Suitable for/ v_c [m/min]	Alu plastics 	Alu cast > 10 % Si 	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	N						
	13 3356	28			23	23	12						11	9								

UNC	11	13 3356	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø	UNC	11	13 3356	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap INOX machine tap									GARANT Master Tap INOX machine tap							
	HSS-E-PM									HSS-E-PM							
	TiAlN									TiAlN							
2-56		eShop 	56	2.18	45	2.8	2.1	1.85	5/16-18		eShop 	18	7.94	90	8	6.2	6.6
4-40		eShop 	40	2.84	56	3.5	2.7	2.35	3/8-16		eShop 	16	9.53	100	9	7	8
5-40		eShop 	40	3.17	56	3.5	2.7	2.65	7/16-14		eShop 	14	11.11	100	8	6.2	9.4
6-32		eShop 	32	3.51	56	4	3	2.85	1/2-13		eShop 	13	12.7	110	9	7	10.8
8-32		eShop 	32	4.16	63	4.5	3.4	3.5	5/8-11		eShop 	11	15.88	110	12	9	13.5
10-24		eShop 	24	4.83	70	6	4.9	3.9	3/4-10		eShop 	10	19.05	125	14	11	16.5
12-24		eShop 	24	5.49	80	6	4.9	4.5	7/8-9		eShop 	9	22.23	140	18	14.5	19.5
1/4-20		eShop 	20	6.35	80	7	5.5	5.1	1-8		eShop 	8	25.4	160	18	14.5	22.25



Through hole machine tap

13 3360 – **GARANT Master Tap universal taps**, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for maximum wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

13 3375 – **HOLEX Pro Tap general-purpose tap**. Sturdy design suitable for a wide spectrum of materials. **Improved HSS-E tool material with low-friction TiN coating.**

Application: For UNC uniform coarse threads ASME – B1.1.



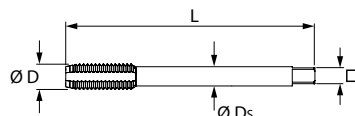
HSS E-PM	2BX	DIN 371	DIN 376
$\leq 3/8"$		$\geq 1/2"$	

13 3360



HSS E	2B	DIN 371	DIN 376
$\leq 1/4"$		$\geq 5/16"$	

13 3375



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
13 3360	30	35	20	30	30	25	12	8						10	8	20	20	●	●	●			
13 3375	24	25	10	24	20	15	8							8			15	●	●	●			

UNC	11	13 3360	121	13 3375	Threads per inch	Thread Ø	L	Ø D _s		□		Tapping hole Ø
	Garant		HOLEX									
	GARANT Master Tap machine tap		HOLEX Pro Tap machine tap									
	HSS-E-PM		HSS-E					13 3360	13 3375	13 3360	13 3375	
		AITiX		TiN		mm	mm	mm	mm	mm	mm	
2-56		eShop 		eShop 	56	2.18	45	2.8	2.8	2.1	2.1	1.85
4-40		eShop 		eShop 	40	2.84	56	3.5	3.5	2.7	2.7	2.35
5-40		eShop 		—	40	3.17	56	3.5	—	2.7	—	2.65
6-32		eShop 		eShop 	32	3.51	56	4	4	3	3	2.85
8-32		eShop 		eShop 	32	4.16	63	4.5	4.5	3.4	3.4	3.5
10-24		eShop 		eShop 	24	4.83	70	6	6	4.9	4.9	3.9
12-24		eShop 		eShop 	24	5.49	80	6	6	4.9	4.9	4.5
1/4-20		eShop 		eShop 	20	6.35	80	7	7	5.5	5.5	5.1
5/16-18		eShop 		eShop 	18	7.94	90	8	6	6.2	4.8	6.6
3/8-16		eShop 		eShop 	16	9.53	100	10	7	8	5.5	8
1/2-13		eShop 		eShop 	13	12.7	110	9	9	7	7	10.8
5/8-11		eShop 		eShop 	11	15.88	110	12	12	9	9	13.5
3/4-10		eShop 		eShop 	10	19.05	125	14	14	11	11	16.5
7/8-9		eShop 		eShop 	9	22.23	140	18	18	14.5	14.5	19.5
1-8		eShop 		—	8	25.4	160	18	—	14.5	—	22.25

Garant

GARANT MASTER TAP – THE MULTI-TALENTED ONE FOR GENERAL-PURPOSE USE.

- **Special flute geometry** ensures optimum chip evacuation.
- **Innovative AITiX coating** for significantly reduced cutting forces.
- **Very high process reliability** in a wide range of materials.
- **For use across a wide spectrum of materials**, thus reducing the variety of tools that have to be stocked.

GARANT Master Tap

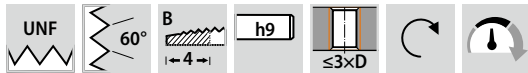
available as a set (M3; M4; M5; M6; M8; M10; M12) in a handy plastic case.
For through hole: No. 14 6435 M3-12,
for blind hole No. 14 6735 M3-12.



14 6435

14 6735





Through hole machine tap

13 3410 – **GARANT Master Tap general-purpose tap**, designed for use on a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for maximum wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

13 3425 – **HOLEX Pro Tap general-purpose tap**. Sturdy design suitable for a wide spectrum of materials. **Improved HSS-E tool material with low-friction TiN coating.**

Application: For UNF unified fine threads ASME – B1.1.



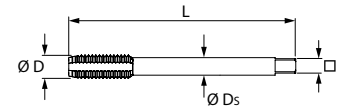
13 3410

HSS E-PM	2BX	DIN 371	DIN 374
		≤3/8"	≥7/16"



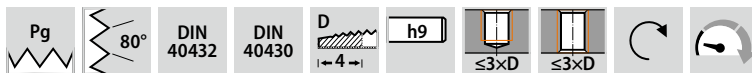
13 3425

HSS E	2B	DIN 371	DIN 374
		≤1/4"	≥5/16"



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
13 3410	30	35	20	30	30	25	12	8						10	8	20	20	●	●	●			
13 3425	24	25	10	24	20	15	8							8			15	●	●	●			

UNF	13 3410 Garant	13 3425 HOLEX	Threads per inch	Thread Ø	L	Ø D _i			Tapping hole Ø
	GARANT Master Tap machine tap	HOLEX Pro Tap machine tap							
	HSS-E-PM AITIX	HSS-E TiN		mm	mm	13 3410 mm	13 3425 mm	13 3410 mm	13 3425 mm
2-64	eShop	—	64	2.18	45	2.8	—	2.1	—
3-56	eShop	—	56	2.51	50	2.8	—	2.1	—
4-48	eShop	—	48	2.84	56	3.5	—	2.7	—
5-44	eShop	—	44	3.17	56	3.5	—	2.7	—
6-40	eShop	—	40	3.51	56	4	—	3	—
8-36	eShop	—	36	4.16	63	4.5	—	3.4	—
10-32	eShop	eShop	32	4.83	70	6	6	4.9	4.9
1/4-28	eShop	eShop	28	6.35	80	7	7	5.5	5.5
5/16-24	eShop	eShop	24	7.94	90	8	6	6.2	4.9
3/8-24	eShop	eShop	24	9.53	90	10	7	8	5.5
7/16-20	eShop	eShop	20	11.11	100	8	8	6.2	6.2
1/2-20	eShop	eShop	20	12.7	100	9	9	7	7
9/16-18	eShop	eShop	18	14.29	100	11	11	9	9
5/8-18	eShop	eShop	18	15.88	100	12	12	9	9
3/4-16	eShop	eShop	16	19.05	110	14	14	11	11
7/8-14	eShop	eShop	14	22.23	125	18	18	14.5	14.5
1-12	eShop	—	12	25.4	140	18	—	14.5	—

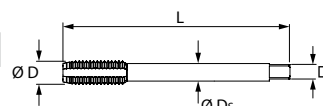


Garant Steel conduits tap

Application: For use as machine tap or for cleaning existing threads by hand.

For steel conduit threads DIN 40430.

Note: Shank produced according to DIN 40432.



13 3450

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
13 3450	13			15	15									6			13		●	○			

PG	TH	13 3450	Threads per inch	Thread Ø	L	Ø D _i			Tapping hole Ø
		Steel conduit tap		mm	mm	mm			mm
PG7		eShop	20	12.5	70	9		7	11.4
PG9		eShop	18	15.2	70	12		9	14
PG11		eShop	18	18.6	80	14		11	17.25
PG13,5		eShop	18	20.4	80	16		12	19
PG16		eShop	18	22.5	80	18		14.5	21.25
PG21		eShop	16	28.3	90	20		16	27



Garant Synchronous trapezoidal spiral point machine tap

Profile correct for NC, with divided envelope cut.

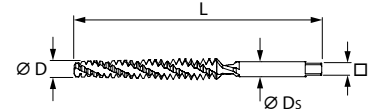
Lead chamfer: ≈ 20 turns. With 25° left-hand flutes, right-hand cutting.

Advantage: Suitable for reversing.

Note: For use on synchronised spindles.
The lead must be machine driven.

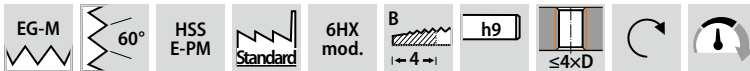


13 3490



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si										INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	P	P	P	P	P	H	H	H	H	M	M	K	N	N					
13 3490	7	7	7	5	3							3	7	7	7	●	●	●			

Tr	13 3490	L	Ø D _s	□	Tapping hole Ø	Tr	13 3490	L	Ø D _s	□	Tapping hole Ø
	Trapezoidal spiral point machine tap						Trapezoidal spiral point machine tap				
	nitrided	mm	mm	mm	mm		nitrided	mm	mm	mm	mm
TR8×1,5	eShop	90	6	4.9	6.6	TR14×4	eShop	165	10	8	10.25
TR10×2	eShop	110	7	5.5	8.2	TR16×4	eShop	190	12	9	12.25
TR10×3	eShop	130	7	5.5	7.25	TR18×4	eShop	195	14	11	14.25
TR12×3	eShop	140	9	7	9.25	TR20×4	eShop	195	16	12	16.25
TR14×3	eShop	145	10	8	11.25	TR24×5	eShop	245	18	14.5	19.25



Garant GARANT Master Tap Alu through hole machine tap for wire inserts

High-performance tap, specially developed for aluminium and non-ferrous alloys. Extra-long flutes and neck length for usable thread depths up to 4xD.

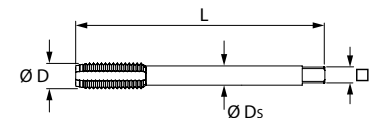
- HSS-E-PM tool material for high cutting edge stability.
- Ultra-smooth DLC coating for wear resistance and avoidance of edge build-up.
- Extra-long flute geometry.

Application: For production of EG mounting thread according to metric ISO thread DIN 8140 for STI wire thread inserts (Screw Thread Insert).

Note: Please be sure to observe the correct tapping hole Ø (see table)!



13 3555



Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Cu	CuZn	Oil	Water	Latex	Acid	Alkali
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	●	●	●	●	●
13 3555	35	32	20	20		18	18										18	25	●	●	●	●	●

EG-M	13 3555	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap Alu machine tap for wire thread inserts					
	DLC	mm	mm	mm	mm	mm
EG-M2	eShop	0.4	55	2.8	2.1	2.15
EG-M2,5	eShop	0.45	56	3.5	2.7	2.65
EG-M3	eShop	0.5	63	4.5	3.4	3.15
EG-M4	eShop	0.7	70	6	4.9	4.2
EG-M5	eShop	0.8	80	6	4.9	5.25
EG-M6	eShop	1	90	8	6.2	6.3
EG-M8	eShop	1.25	105	10	8	8.4
EG-M10	eShop	1.5	110	9	7	10.5
EG-M12	eShop	1.75	125	11	9	12.5
EG-M16	eShop	2	150	14	11	16.5



GARANT Master Tap through hole machine tap for wire inserts

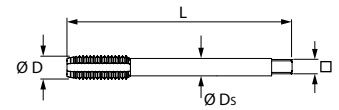
Tap to **DIN 40435** (similar to DIN 371 / DIN 376).

GARANT Master Tap Universal taps, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for maximum wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

Application: For production of EG mounting thread according to metric ISO thread **DIN 8140** for **STI wire thread inserts** (Screw Thread Insert).

Note: Please ensure without fail the correct **tapping drill Ø** (see table)!



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	K	N					
13 3560	30	35	20	30	30	25	12	8					10	8	20	20					

EG-M	13 3560	Thread pitch	L	Ø D _s	□	Tapping hole Ø	EG-M	13 3560	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap machine tap for wire thread inserts							GARANT Master Tap machine tap for wire thread inserts					
	HSS-E-PM							HSS-E-PM					
	AITIX	mm	mm	mm	mm	mm		AITIX	mm	mm	mm	mm	mm
EG-M2	eShop	0.4	50	2.8	2.1	2.15	EG-M8	eShop	1.25	100	10	8	8.4
EG-M2,5	eShop	0.45	56	3.5	2.7	2.65	EG-M10	eShop	1.5	100	9	7	10.5
EG-M3	eShop	0.5	63	4.5	3.4	3.15	EG-M12	eShop	1.75	110	11	9	12.5
EG-M4	eShop	0.7	70	6	4.9	4.2	EG-M16	eShop	2	125	14	11	16.5
EG-M5	eShop	0.8	80	6	4.9	5.25	EG-M20	eShop	2.5	125	18	14.5	20.75
EG-M6	eShop	1	90	8	6.2	6.3							

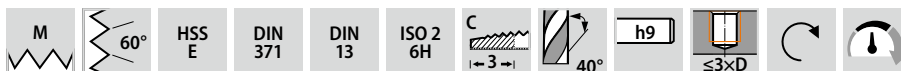
GARANT Thread inserts and thread repairs



Wire thread inserts allow high-security fastenings even in low-strength metallic materials. HELICOIL PLUS thread inserts are highly precise, corrosion-resistant and extremely capable of withstanding high temperatures.



Thread inserts and tools for thread repairs can be found in the Hoffmann Group Catalogue „Hand Tools and Metrology“ from No. 08 2800.

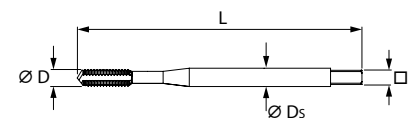


GARANT Blind hole machine tap

Two spiral flutes with **polished** chip space.

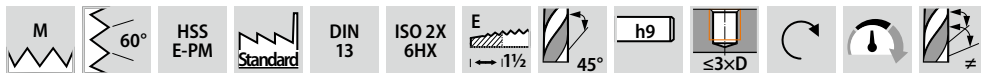
Advantage: Reliable swarf evacuation, due to the high helix angle and wide flutes.

Application: Suitable for tensile strength up to maximum 300 N/mm².



Suitable for/ v_c [m/min]	Alu	Alu	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Honey- comb sandwich	MMC	GRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
13 4200	13	13	30			30																	

M	TH	13 4200	Thread pitch	L	Ø D _s	□	Tapping hole Ø
		Machine tap	mm	mm	mm	mm	mm
M2		eShop	0.4	45	2.8	2.1	1.6
M2,5		eShop	0.45	50	2.8	2.1	2.05
M3		eShop	0.5	56	3.5	2.7	2.5
M4		eShop	0.7	63	4.5	3.4	3.3
M5		eShop	0.8	70	6	4.9	4.2
M6		eShop	1	80	6	4.9	5
M8		eShop	1.25	90	8	6.2	6.8
M10		eShop	1.5	100	10	8	8.5



GARANT Master Tap Alu blind hole machine tap

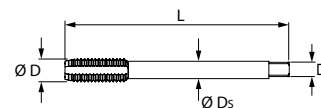
High-performance tap, specially developed for **aluminium and non-ferrous alloys**.
Dynamic helical pitch of the clamping slots ensure **optimum chip evacuation** and **process reliability**.

- **HSS-E-PM tool material** – for high cutting edge stability.
- **Ultra-smooth DLC coating** for wear resistance and avoidance of edge build-up.
- **Dynamic helical pitch of the flutes.**
- **Short lead chamfer form E.**

13 4265 – With extra long shank.

Note:

13 4260 Size M1,6–M2,5 – Suitable up to thread depth 2.5xD.



13 4260



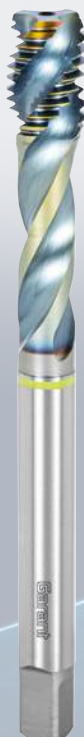
13 4265

Suitable for/ v _c [m/min]	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
13 4260/4265	35	32	20	20	18	18										18	25					

M	13 4260	13 4265	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap Alu machine tap						
	DLC	extra long DLC	mm	13 4260 mm	13 4265 mm	mm	mm
M1,6	eShop	—	0.35	40	—	2.5	2.1
M2	eShop	—	0.4	45	—	2.8	2.1
M2,5	eShop	—	0.45	50	—	2.8	2.1
M3	eShop	eShop	0.5	56	100	3.5	2.7
M4	eShop	eShop	0.7	63	125	4.5	3.4
M5	eShop	eShop	0.8	70	160	6	4.9
M6	eShop	eShop	1	80	160	6	4.9
M8	eShop	eShop	1.25	95	180	8	6.2
M10	eShop	eShop	1.5	110	200	10	8
M12	eShop	eShop	1.75	115	200	9	7
M14	eShop	—	2	120	—	11	9
M16	eShop	eShop	2	125	200	12	9
M20	eShop	eShop	2.5	155	200	16	12

GARANT THE GARANT MASTER TAP FAMILY

GARANT MASTER TAP ALU



N

The performer
No. 13 4260

GARANT MASTER TAP INOX



M

The specialist
No. 13 5732

GARANT MASTER TAP STEEL^{HT}



P

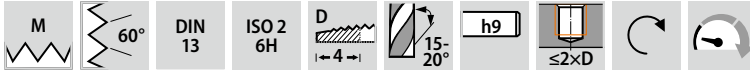
The problem solver
No. 13 5371

GARANT MASTER TAP



N M P K

The all-rounder
No. 13 5960

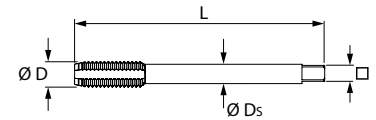


Garant Blind hole machine tap

Sturdy design, with 15 – 20° right-hand helix.
Size M2.6 has the old DIN profile.

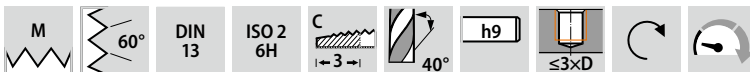


13 4600



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 10% Si 	Alu cast 10% Si 										INOX	INOX	Ti	Graphite GRP CRP	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 4600	13	13	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15						

M	1H	13 4600	Thread pitch	L	Ø D _s	□	Tapping hole Ø	M	1H	13 4600	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap								Machine tap						
M2		eShop	0.4	45	2.8	2.1	1.6	M9		eShop	1.25	90	9	7	7.8
M2,2		eShop	0.45	45	2.8	2.1	1.75	M10		eShop	1.5	100	10	8	8.5
M2,5		eShop	0.45	50	2.8	2.1	2.05	M11		eShop	1.5	100	11	9	9.5
M2,6		eShop	0.45	50	2.8	2.1	2.1	M12		eShop	1.75	110	9	7	10.2
M3		eShop	0.5	56	3.5	2.7	2.5	M14		eShop	2	110	11	9	12
M3,5		eShop	0.6	56	4	3	2.9	M16		eShop	2	110	12	9	14
M4		eShop	0.7	63	4.5	3.4	3.3	M18		eShop	2.5	125	14	11	15.5
M4,5		eShop	0.75	70	6	4.9	3.7	M20		eShop	2.5	140	16	12	17.5
M5		eShop	0.8	70	6	4.9	4.2	M24		eShop	3	160	18	14.5	21
M6		eShop	1	80	6	4.9	5	M27		eShop	3	160	20	16	24
M7		eShop	1	80	7	5.5	6	M30		eShop	3.5	180	22	18	26.5
M8		eShop	1.25	90	8	6.2	6.8								



Garant Blind hole machine tap

13 4620 – **HSS-E-PM steel for high wear resistance and strong right-hand chip flutes**, for optimum chip evacuation.

13 4660 – **With extra long shank.**

≤ M10:Shank to DIN 371;

≥ M12:Shank to DIN 376.

Advantage:

13 4660 – Designed **for tapping threads where access is difficult.**

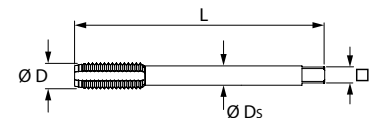


13 4620

HSS E-PM	DIN 371	DIN 376
	≤ M10	≥ M12

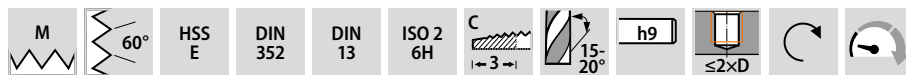


134660



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10% Si 	Alu cast > 10% Si 										INOX	INOX	Ti	GG(G)	Graphite CRP						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
13 4620		15	18	18	18	9												●	○				
13 4660		13	15	15												9		●	○				

M	1H 13 4620		1H 13 4660		Thread pitch	L			Ø D _s	□	Tapping hole Ø	M	1H 13 4620		1H 13 4660		Thread pitch	L			Ø D _s	□	Tapping hole Ø
	Machine tap												Machine tap										
	HSS-E-PM	extra long HSS-E	13 4620	13 4660		HSS-E-PM	extra long HSS-E	13 4620					13 4660	HSS-E-PM	extra long HSS-E	13 4620		13 4660					
M3	eShop	eShop	0.5	56	112	3.5	2.7	2.5	M10	eShop	eShop	1.5	100	160	10	8	8.5						
M4	eShop	eShop	0.7	63	112	4.5	3.4	3.3	M12	eShop	eShop	1.75	110	180	9	7	10.2						
M5	eShop	eShop	0.8	70	125	6	4.9	4.2	M16	eShop	eShop	2	110	220	12	9	14						
M6	eShop	eShop	1	80	125	6	4.9	5	M20	eShop	eShop	2.5	140	280	16	12	17.5						
M8	eShop	eShop	1.25	90	140	8	6.2	6.8															



Garant Blind hole machine tap short

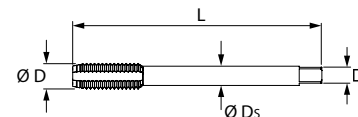
The short shank projects less and hence is more stable.



The right-hand flutes evacuate the swarf upwards out of the blind hole.

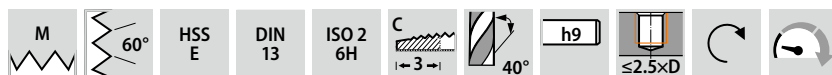


13 4650



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	Ti	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	N		●	○			
13 4650	13			15	15																		

M	11H	13 4650	Thread pitch	L	Ø D _s	□	Tapping hole Ø
		Machine tap					
		short	mm	mm	mm	mm	mm
M3		eShop	0.5	40	3.5	2.7	2.5
M4		eShop	0.7	45	4.5	3.4	3.3
M5		eShop	0.8	50	6	4.9	4.2
M6		eShop	1	50	6	4.9	5
M8		eShop	1.25	56	6	4.9	6.8
M10		eShop	1.5	70	7	5.5	8.5
M12		eShop	1.75	75	9	7	10.2



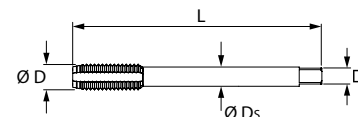
DIN 371
DIN 376
≤ M10 ≥ M12

HOLEX Clever Tap blind hole machine tap

Sturdy tap for conventional standard applications. High-quality HSS-E tool material and geometry for steels. Surface: Bronze-coloured tempered thread profile.

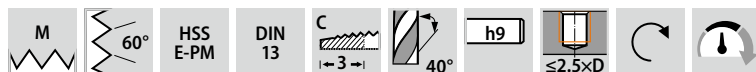


13 5255



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	Ti	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	N	●	●			
13 5255	13	13		12	12	6																

M	12H	13 5255	Thread pitch	L	Ø D _s	□	Tapping hole Ø
		HOLEX Clever Tap machine tap					
M3		eShop	0.5	56	3.5	2.7	2.5
M4		eShop	0.7	63	4.5	3.4	3.3
M5		eShop	0.8	70	6	4.9	4.2
M6		eShop	1	80	6	4.9	5
M8		eShop	1.25	90	8	6.2	6.8
M10		eShop	1.5	100	10	8	8.5
M12		eShop	1.75	110	9	7	10.2
M16		eShop	2	110	12	9	14
M20		eShop	2.5	140	16	12	17.5
M24		eShop	3	160	18	14.5	21



DIN 371	DIN 376
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< M10 > M12

Garant GARANT Master Tap Steel^{HT} blind hole machine tap

High-performance tap, specially developed for use in **steels with high tensile strength** and for **difficult-to-machine materials**.

Sturdy design with **optimised guide thread to avoid chips jamming.**

- **HSS-E-PM tool material** – for **very high cutting edge stability.**
- **Optimised honed cutting edges.**
- **TiAlN coating** – for **maximum wear protection.**

13 5374 – Tolerance class: ISO 3X/6GX.

Application:

13 5374 – For components which are galvanised or shrink slightly when hardened.

Recommendation: For TOOLOX and HARDOX materials we recommend deviating from the DIN data (see table) by selecting a larger tapping hole Ø.

Note: For **TOOLOX** and **HARDOX** materials:
do not exceed the maximum thread depth $2 \times D$!



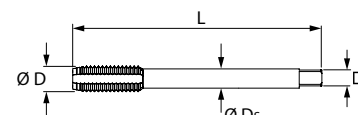
ISO 2X
6HX

135371



ISO 3X
6GV

13 5374



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si												TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX	Ti					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	H	H	H	H	M	S					
13.5371/5374					30	20	15	12	5						15	5	7	5	●	●			

M	13 5371		13 5374		Thread pitch	L	Ø D _s		Tapping hole Ø
	GARANT Master Tap Steel ^{HST} machine tap								
	HSS-E-PM Form C 6HX	HSS-E-PM Form C 6GX							
	TiAlN	TiAlN							
				mm	mm	mm	mm	mm	
M3	eShop	eShop		0.5	56	3.5	2.7	2.5	
M4	eShop	eShop		0.7	63	4.5	3.4	3.3	
M5	eShop	eShop		0.8	70	6	4.9	4.2	
M6	eShop	eShop		1	80	6	4.9	5	
M8	eShop	eShop		1.25	90	8	6.2	6.8	
M10	eShop	eShop		1.5	100	10	8	8.5	
M12	eShop	eShop		1.75	110	9	7	10.2	
M14	eShop	eShop		2	110	11	9	12	
M16	eShop	eShop		2	110	12	9	14	
M20	eShop	eShop		2.5	140	16	12	17.5	
M24	eShop	eShop		3	160	18	14.5	21	
M27	eShop	—		3	160	20	16	24	
M30	eShop	—		3.5	180	22	18	26.5	

Garant **GARANT MASTER TAP STEEL^{HT} – THE PROBLEM-SOLVER –
DEVELOPED FOR STEELS THAT ARE DIFFICULT TO MACHINE**



1.2379 (X 153 CrMoV 12)

High-alloy cold-working steel with high toughness and wear resistance.

Application:

Cutting punches, pressure plates and cutter inserts, general mould making.



1.7225 (42CrMo4+QT)

Alloyed heat treatable steel with high strength.

Application:

General mechanical engineering, automotive industry, steering knuckles, connecting rods and gear wheels.

**Toolox44**

Pre-hardened machinery steel and tool steel.

Application:

Extrusion moulds and machine building components, injection mould making.



HARDOX400

Abrasion-resistant steel with a nominal hardness of 400 HBW.

Application:

Conveyor systems, excavators, gear wheels and chain wheels.



Garant Synchronised blind hole machine tap with internal coolant supply

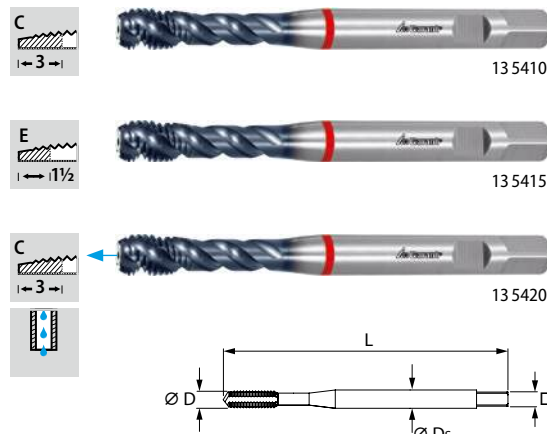
Sturdy version with right-hand helix and shank to DIN 1835-B. Special geometry for use on machines with **synchronised spindle drives**. The tap is guided by the synchronised spindle on the machine. Special **TiAIN-S coating** for optimum tool life. For use with **emulsion** (fat content minimum 8%).

13 5415 – **Form E** (lead chamfer: 1.5 - 2 turns) for the deepest possible thread depths.

13 5420 – With **internal coolant supply** for maximum tool life.

Recommendation: For **TOOLOX materials** we recommend **deviating from the DIN data** (see table) by drilling the tapping hole $\varnothing$ **0.05 to 0.3mm** larger.

Note: For use on **synchronised spindles**, the **GARANT quick-change tapping chuck No. 338100 – 338121 with minimum length adjustment (MLA)** ensures very high process reliability.



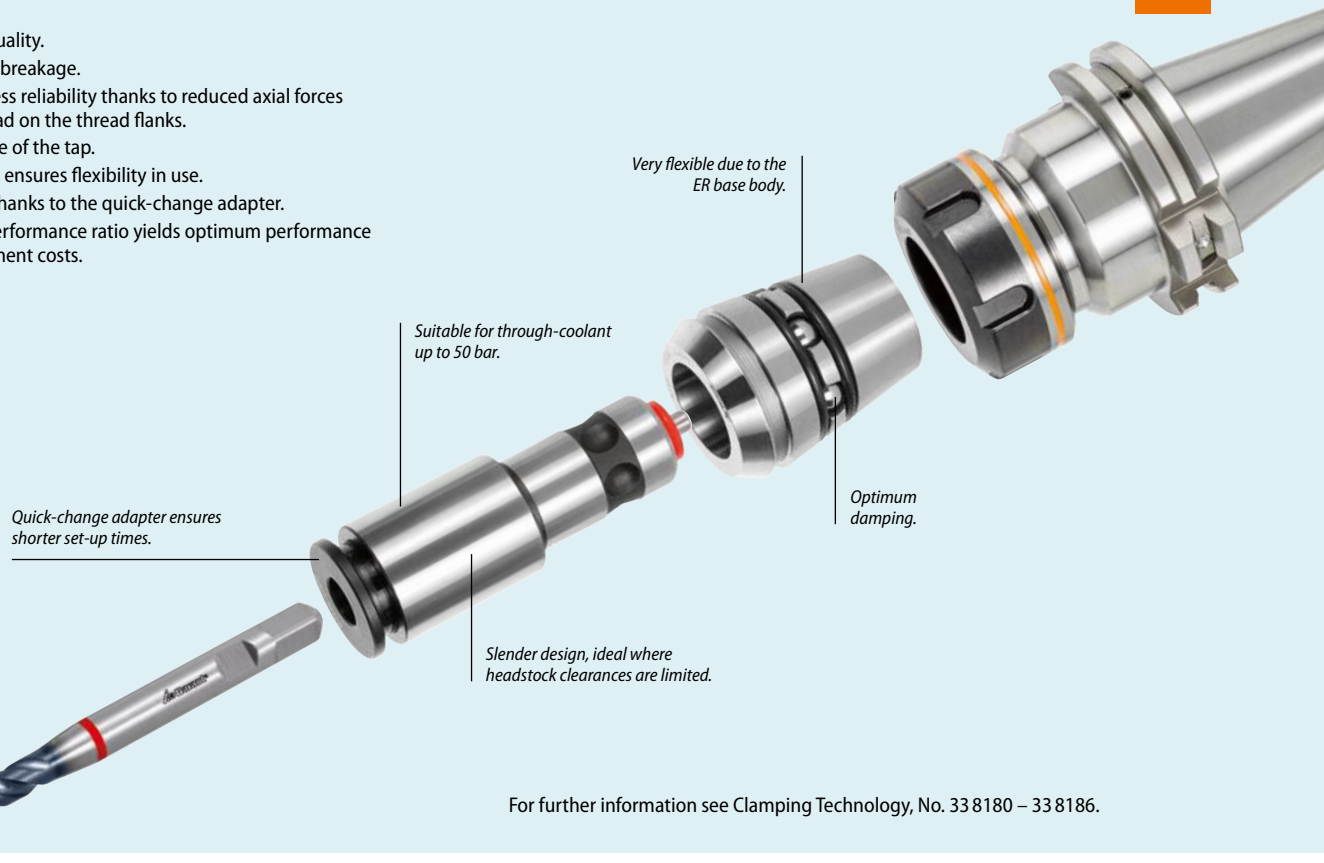
Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si													TOOLOX 33 HRC	TOOLOX 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	H	M	M	S					
13 5410–13 5420					32	20	12	7							7	3									

M	TH	13 5410	13 5415	13 5420	Thread pitch	L	$\varnothing D_s$	$\square$	Tapping hole $\varnothing$
		Machine tap for synchronised spindles							
		HSS-E-PM Form C	HSS-E-PM Form E	HSS-E-PM IC / Form C					
		TiAIN	TiAIN	TiAIN	mm	mm	mm	mm	mm
M3		eShop	eShop	—	0.5	70	6	4.9	2.5
M4		eShop	eShop	—	0.7	70	6	4.9	3.3
M5		eShop	eShop	eShop	0.8	70	6	4.9	4.2
M6		eShop	eShop	eShop	1	80	6	4.9	5
M8		eShop	eShop	eShop	1.25	90	8	6.2	6.8
M10		eShop	eShop	eShop	1.5	100	10	8	8.5
M12		eShop	eShop	eShop	1.75	110	12	9	10.2
M16		eShop	eShop	eShop	2	110	12	9	14

13 Synchro insert with ER collet base body

Advantages:

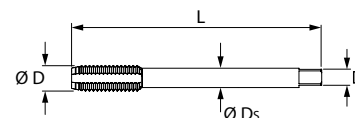
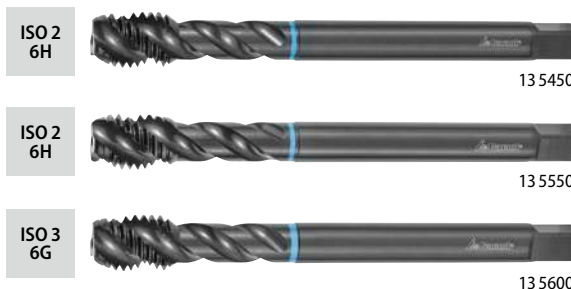
- Better thread quality.
- Less risk of tool breakage.
- Increased process reliability thanks to reduced axial forces and reduced load on the thread flanks.
- Increases the life of the tap.
- Modular design ensures flexibility in use.
- Easy handling thanks to the quick-change adapter.
- Perfect price/performance ratio yields optimum performance at low procurement costs.



For further information see Clamping Technology, No. 338180 – 338186.

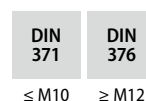


13 5600 – For components which are **galvanised** after threading or shrink slightly when hardened.

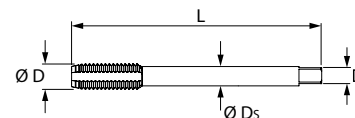


Suitable for/ v_c [m/min]	Alu plastics 	Alu cast 	Alu cast 											INOX 	INOX 	Ti 	CuZn 	Graphite GRP CRP 					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
13 5450–13 5600		13		15	15	15								6			13						

M	11H	13 5450	11H	13 5550	11H	13 5600	Thread pitch	L	Ø D _s		Tapping hole Ø
	Machine tap										
			tapered	6G							
	vaporised	vaporised	vaporised								
M2	eShop		—		eShop		0.4	45	2.8	2.1	1.6
M2,5	eShop		—		eShop		0.45	50	2.8	2.1	2.05
M2,6	eShop		—		—		0.45	50	2.8	2.1	2.1
M3	eShop		eShop		eShop		0.5	56	3.5	2.7	2.5
M4	eShop 		eShop		eShop		0.7	63	4.5	3.4	3.3
M5	eShop		eShop		eShop		0.8	70	6	4.9	4.2
M6	eShop 		eShop		eShop		1	80	6	4.9	5
M8	eShop		eShop		eShop		1.25	90	8	6.2	6.8
M10	eShop		eShop		eShop		1.5	100	10	8	8.5
M12	eShop		eShop		eShop		1.75	110	9	7	10.2
M14	eShop		eShop		eShop		2	110	11	9	12
M16	eShop		eShop		eShop		2	110	12	9	14
M18	eShop		—		—		2.5	125	14	11	15.5
M20	eShop		eShop		eShop		2.5	140	16	12	17.5
M24	eShop		—		—		3	160	18	14.5	21
M30	eShop		—		—		3.5	180	22	18	26.5



Advantage: This allows the tap to be reversed with little risk of chips jamming and causing damage to the tap.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si											INOX	INOX	Ti	CuZn	Graphite GRP CRP					
	ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N			
	13 5650	13		15	15	15								6	4		13		●	●		

M	11H 13 5650	Thread pitch	L	Ø D _s	□	Tapping hole Ø	M	11H 13 5650	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap							Machine tap					
	vaporised	mm	mm	mm	mm	mm		vaporised	mm	mm	mm	mm	mm
M2	eShop	0.4	45	2.8	2.1	1.6	M8	eShop	1.25	90	8	6.2	6.8
M2,5	eShop	0.45	50	2.8	2.1	2.05	M10	eShop	1.5	100	10	8	8.5
M3	eShop	0.5	56	3.5	2.7	2.5	M12	eShop	1.75	110	9	7	10.2
M4	eShop	0.7	63	4.5	3.4	3.3	M16	eShop	2	110	12	9	14
M5	eShop	0.8	70	6	4.9	4.2	M20	eShop	2.5	140	16	12	17.5
M6	eShop	1	80	6	4.9	5	M24	eShop	3	160	18	14.5	21



GARANT Master Tap INOX blind hole machine tap for stainless and acid-resistant steels

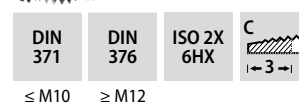
High-performance tap, specially developed for **good process reliability in stainless and acid-resistant steels and duplex materials.**

The 45° helix angle of the flutes facilitates chip formation especially in ductile austenitic CrNi steels.

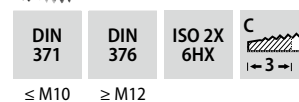
- **HSS-E-PM tool material** for a high degree of wear resistance
 - The latest generation of **TiAlN multi-layer coating**
 - **Parameterised flute geometry** for optimum chip formation and **torsional rigidity**
 - 13 5734 – With internal coolant supply
 - 13 5736 – Form E (lead chamfer: 1.5 - 2 turns).
 - 13 5737 – **Tolerance class ISO 3X/6GX.** For components which are **galvanised** or shrink slightly when hardened.
 - 13 5739 – **With extra long shank.**
- 13 5739 Size M3–M10 – Shank to DIN 371.
13 5739 Size M12–M24 – Shank to DIN 376.

Advantage:

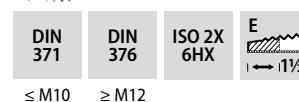
- 13 5739 – Designed for tapping threads where access is difficult.



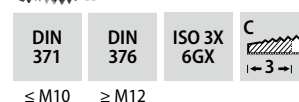
13 5732



13 5734



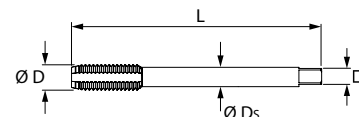
13 5736



13 5737



13 5739



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 5732–13 5737		28			23	23	12							11	9								
13 5739		20			16	16	8							7	6								

M	13 5732	13 5734	13 5736	13 5737	13 5739	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap INOX machine tap									
	HSS-E-PM Form C 6HX	HSS-E-PM IC/ Form C 6HX	HSS-E-PM Form E 6HX	HSS-E-PM Form C 6GX	extra long HSS-E-PM Form C 6HX		13 5732 13 5734 13 5736 13 5737	13 5739		
	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm
M1,6	eShop	—	—	—	—	0.35	40	—	2.5	1.25
M2	eShop	—	eShop	eShop	—	0.4	45	—	2.8	1.6
M2,5	eShop	—	—	—	—	0.45	50	—	2.8	2.05
M2,6	eShop	—	—	—	—	0.45	50	—	2.8	2.1
M3	eShop	—	eShop	eShop	eShop	0.5	56	112	3.5	2.5
M4	eShop	—	eShop	eShop	eShop	0.7	63	126	4.5	3.4
M5	eShop	—	eShop	eShop	eShop	0.8	70	140	6	4.9
M6	eShop	eShop	eShop	eShop	eShop	1	80	160	6	4.9
M8	eShop	eShop	eShop	eShop	eShop	1.25	90	180	8	6.2
M10	eShop	eShop	eShop	eShop	eShop	1.5	100	200	10	8
M12	eShop	eShop	eShop	eShop	eShop	1.75	110	220	9	7
M14	eShop	eShop	eShop	eShop	eShop	2	110	220	11	9
M16	eShop	eShop	eShop	eShop	eShop	2	110	220	12	9
M20	eShop	eShop	eShop	eShop	eShop	2.5	140	280	16	12
M24	eShop	eShop	eShop	eShop	eShop	3	160	300	18	14.5



Garant Synchronised blind hole machine tap with internal coolant supply

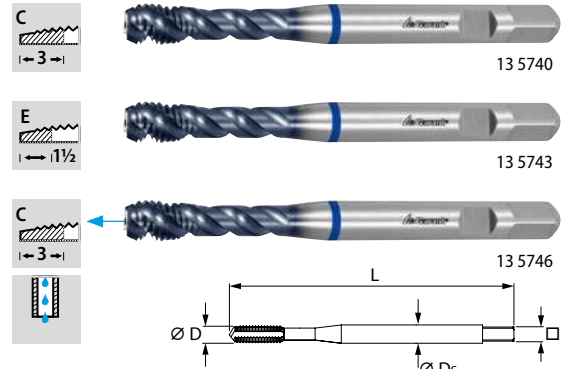
Sturdy version with right-hand helix and shank to DIN 1835-B. Special geometry for use on machines with **synchronised spindle drives**. The tap is controlled by the synchronising spindle of the machine.

Special **TiAlN coating** for optimum tool life. For use with **emulsion** (fat content minimum 8%).

13 5743 – **Form E** (lead chamfer: 1.5 - 2 turns) for the deepest possible thread depths.

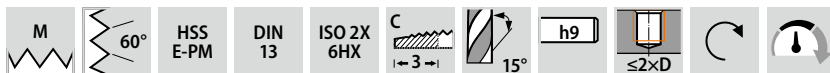
13 5746 – With **internal coolant supply** for maximum tool life.

Note: For use on **synchronised spindles**, the **GARANT** quick-change tapping chuck No. 338100 – 338121 with **minimum length adjustment (MLA)** ensures very high process reliability.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	N	N					
13 5740–13 5746	32			32	20									11	9		30						

M	13 5740	13 5743	13 5746	Thread pitch	L	Ø D _i	□	Tapping hole Ø
	Machine tap for synchronised spindles							
	HSS-E-PM Form C	HSS-E-PM Form E	HSS-E-PM IC / Form C					
	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm
M2,5	eShop	eShop	—	0.45	70	6	4.9	2.05
M3	eShop	eShop	—	0.5	70	6	4.9	2.5
M4	eShop	eShop	—	0.7	70	6	4.9	3.3
M5	eShop	eShop	eShop	0.8	70	6	4.9	4.2
M6	eShop	eShop	eShop	1	80	6	4.9	5
M8	eShop	eShop	eShop	1.25	90	8	6.2	6.8
M10	eShop	eShop	eShop	1.5	100	10	8	8.5
M12	eShop	eShop	eShop	1.75	110	12	9	10.2
M16	eShop	eShop	eShop	2	110	12	9	14



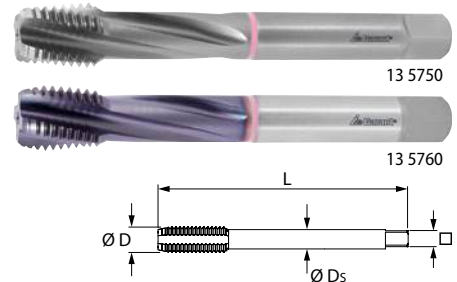
Garant Blind hole machine tap

Sturdy design, with 15° right-hand chip flutes.

13 5760 – For use with **emulsion** (fat content minimum 8%).

DIN 371
≤ M12

DIN 376
≥ M14



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 5750						18	9	3								4							
13 5760						23	13	7								5							

M	13 5750	13 5760	Thread pitch	L	Ø D _i	□	Tapping hole Ø
	Machine tap						
	HSS-E-PM						
	nitrided	TiCN	mm	mm	mm	mm	mm
M2	eShop	eShop	0.4	45	2.8	2.1	1.6
M2,5	eShop	eShop	0.45	50	2.8	2.1	2.05
M3	eShop	eShop	0.5	56	3.5	2.7	2.5
M3,5	eShop	eShop	0.6	56	4	3	2.9
M4	eShop	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	eShop	0.8	70	6	4.9	4.2
M6	eShop	eShop	1	80	6	4.9	5
M8	eShop	eShop	1.25	90	8	6.2	6.8
M10	eShop	eShop	1.5	100	10	8	8.5
M12	eShop	eShop	1.75	110	12	9	10.2
M14	—	eShop	2	110	11	9	12
M16	eShop	eShop	2	110	12	9	14
M20	eShop	eShop	2.5	140	16	12	17.5



Blind hole machine tap

13 5810 – Shank to **DIN 376** (shank Ø relieved); thus suitable for greater operating depths.

13 5815 – **Form E** (1.5–2 turns lead chamfer).

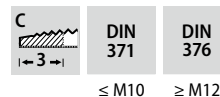
13 5805/5810/5855/5910 – **Form C** (2–3 turns lead chamfer).

13 5910 – **HOLEX Pro Tap general-purpose tap**.

Sturdy design suitable for a wide spectrum of materials.

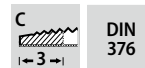
Improved HSS-E tool material with friction-reduction TiN coating.

13 5805–5815 – **Form C** (2–3 turns lead chamfer).

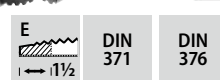


13 5805

≤ M10 ≥ M12



13 5810



13 5815

≤ M10 ≥ M12



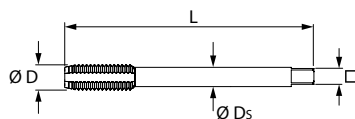
13 5855

≤ M10 ≥ M12



13 5910

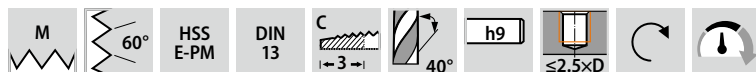
≤ M10 ≥ M12



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 5805–13 5815	18	13		18	15	15	6							6			15	●	●	●			
13 5855		11		12	8	7	4										12	●	●	●			
13 5910	24	25	10	24	20	15	8							8			15	●	●	●			

M	13V	13 5805	13V	13 5810	13V	13 5815	12H	13 5855	12I	13 5910	Thread pitch	L	Ø D _s		□		Tapping hole Ø
	Garant					HOLEX							13 5805 13 5815 13 5855 13 5910	13 5810	13 5805 13 5815 13 5855 13 5910	13 5810	
	GARANT Vap Tap machine tap					Machine tap	HOLEX Pro Tap machine tap										
	HSS-E Form C	HSS-E Form C DIN 376	HSS-E Form E	HSS-E Form C	HSS-E Form C												
	vaporised	vaporised	vaporised	vaporised	TiN			mm	mm	mm							
M1,6	eShop	—	—	—	—	—	—	—	—	—	0.35	40	2.5	—	2.1	—	1.25
M2	eShop	—	—	—	—	—	—	eShop	—	—	0.4	45	2.8	—	2.1	—	1.6
M2,5	eShop	—	—	—	—	—	—	eShop	—	—	0.45	50	2.8	—	2.1	—	2.05
M3	eShop	eShop	eShop	eShop	eShop	■	eShop	eShop	—	—	0.5	56	3.5	2.2	2.7	—	2.5
M3,5	eShop	—	—	—	—	—	—	—	—	—	0.6	56	4	—	3	—	2.9
M4	eShop	eShop	eShop	eShop	eShop	■	eShop	eShop	—	—	0.7	63	4.5	2.8	3.4	2.1	3.3
M5	eShop	eShop	eShop	eShop	eShop	■	eShop	eShop	—	—	0.8	70	6	3.5	4.9	2.7	4.2
M6	eShop	eShop	eShop	eShop	eShop	■	eShop	eShop	—	—	1	80	6	4.5	4.9	3.4	5
M7	eShop	—	—	—	—	—	—	—	—	—	1	80	7	—	5.5	—	6
M8	eShop	eShop	eShop	eShop	eShop	■	eShop	eShop	—	—	1.25	90	8	6	6.2	4.9	6.8
M10	eShop	eShop	eShop	eShop	eShop	■	eShop	eShop	—	—	1.5	100	10	7	8	5.5	8.5
M12	eShop	—	eShop	eShop	eShop	■	eShop	eShop	—	—	1.75	110	9	—	7	—	10.2
M14	eShop	—	—	—	eShop	—	eShop	eShop	—	—	2	110	11	—	9	—	12
M16	eShop	—	—	eShop	eShop	■	eShop	eShop	—	—	2	110	12	—	9	—	14
M18	eShop	—	—	—	—	—	—	—	—	—	2.5	125	14	—	11	—	15.5
M20	eShop	—	—	eShop	eShop	—	eShop	eShop	—	—	2.5	140	16	—	12	—	17.5
M22	eShop	—	—	—	—	—	—	—	—	—	2.5	140	18	—	14.5	—	19.5
M24	eShop	—	—	—	—	—	eShop	eShop	—	—	3	160	18	—	14.5	—	21
M27	eShop	—	—	—	—	—	—	—	—	—	3	160	20	—	16	—	24
M30	eShop	—	—	—	—	—	—	eShop	—	—	3.5	180	22	—	18	—	26.5
M33	eShop	—	—	—	—	—	—	—	—	—	3.5	180	25	—	20	—	29.5
M36	eShop	—	—	—	—	—	—	—	—	—	4	200	28	—	22	—	32





DIN 371
DIN 376
≤ M10 ≥ M12

GARANT Master Tap blind hole machine tap

Universal taps, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for a high degree of wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

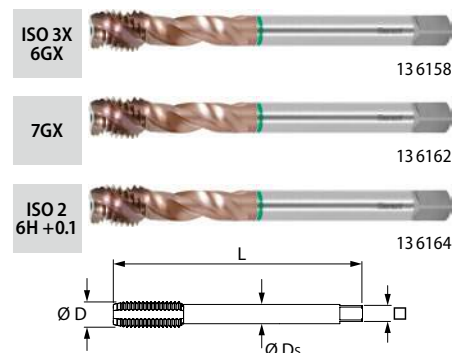
13 6158 – **Tolerance class: ISO 3X/6GX**

13 6162 – **Tolerance class: 7GX**

13 6164 – **Tolerance class: ISO 2/6H+0.1**

Application: For components which are galvanised or shrink slightly when hardened.

Recommendation: We recommend increasing the size of the tapping hole Ø by the tolerance allowance.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	K	N						
13 6158–13 6164	30	35	20	30	30	25	12	8						10	8	20	20	●	●	●			

M	13 6158	13 6162	13 6164	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap machine tap							
	HSS-E-PM Form C 6GX	HSS-E-PM Form C 7GX	HSS-E-PM Form C 6H+0.1					
	AITIX	AITIX	AITIX	mm	mm	mm	mm	mm
M2	eShop	eShop	–	0.4	45	2.8	2.1	1.6
M3	eShop	eShop	eShop	0.5	56	3.5	2.7	2.5
M4	eShop	eShop	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	eShop	eShop	0.8	70	6	4.9	4.2
M6	eShop	eShop	eShop	1	80	6	4.9	5
M8	eShop	eShop	eShop	1.25	90	8	6.2	6.8
M10	eShop	eShop	eShop	1.5	100	10	8	8.5
M12	eShop	eShop	eShop	1.75	110	9	7	10.2
M14	eShop	–	–	2	110	11	9	12
M16	eShop	eShop	eShop	2	110	12	9	14
M20	eShop	–	–	2.5	140	16	12	17.5
M24	eShop	–	–	3	160	18	14.5	21



GARANT Master Tap blind hole machine tap, extra long shank

Universal taps, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for a high degree of wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

With extra long shank.

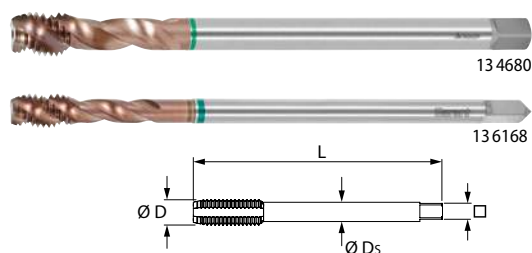
13 6168 – **All sizes with shank to DIN 376 (= shank Ø tapered).**

Therefore suitable for greater operating depths.

13 4680 Size M3–M10 – **Shank to DIN 371.**

Size M12–M20 – **Shank to DIN 376.**

Advantage: Designed for tapping threads where access is difficult.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
13 4680/6168	24	28	16	24	24	20	10	6						8	6	16	16	●	●	●			

M	11	13 4680	11	13 6168	Thread pitch	L	Ø D _s		□		Tapping hole Ø
	GARANT Master Tap machine tap						13 4680	13 6168	13 4680	13 6168	
	HSS-E-PM extra long Form C 6HX		HSS-E-PM extra long Form C 6HX DIN 376								
	AITIX		AITIX								
					mm	mm	mm	mm	mm	mm	mm
M3		eShop		—	0.5	100	3.5	—	2.7	—	2.5
M4		eShop		eShop	0.7	125	4.5	2.8	3.4	2.1	3.3
M5		eShop		eShop	0.8	160	6	3.5	4.9	2.7	4.2
M6		eShop		eShop	1	160	6	4.5	4.9	3.4	5
M8		eShop		eShop	1.25	180	8	6	6.2	4.9	6.8
M10		eShop		eShop	1.5	200	10	7	8	5.5	8.5
M12		eShop		—	1.75	200	9	—	7	—	10.2
M14		eShop		—	2	200	11	—	9	—	12
M16		eShop		—	2	200	12	—	9	—	14
M20		eShop		—	2.5	200	16	—	12	—	17.5



Garant Synchronised blind hole machine tap with internal coolant supply

Sturdy design with right-hand chip flutes and shank to DIN 1835-B.

Special geometry for **universal applications** on machines with **synchronised spindle drive**.

The tap is guided by the synchronised spindle on the machine.

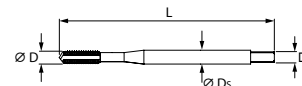
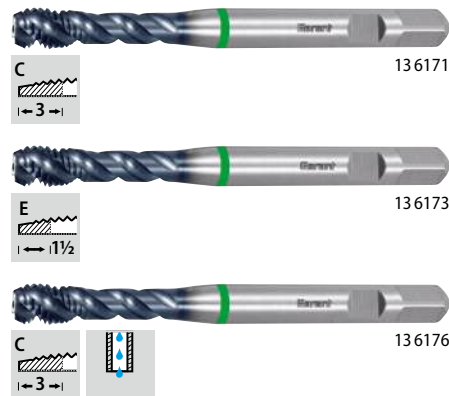
Special **TiAIN-S coating** for optimum tool life.

For use with **emulsion** (fat content minimum 8%).

13 6173 – **Form E** (lead chamfer: 1.5 - 2 turns) for the deepest possible thread depths.

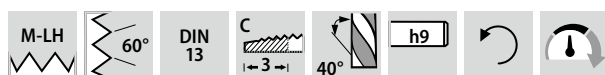
13 6176 – **Internal coolant feed** for maximum tool life.

Note: For use on **synchronised spindles**, the **GARANT** quick-change tapping chuck **No. 338100 – 338121** with **minimum length adjustment (MLA)** ensures very high process reliability.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 6171–13 6176	32	32	32	33	32	20	12	7						11	9		30						

M	13 6171	13 6173	13 6176	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	Machine tap for synchronised spindles							
	HSS-E-PM Form C TiAIN	HSS-E-PM Form E TiAIN	HSS-E-PM IC/ Form C TiAIN	mm	mm	mm	mm	mm
M2,5	eShop	eShop	–	0.45	70	6	4.9	2.05
M3	eShop	eShop	–	0.5	70	6	4.9	2.5
M4	eShop	eShop	–	0.7	70	6	4.9	3.3
M5	eShop	eShop	eShop	0.8	70	6	4.9	4.2
M6	eShop	eShop	eShop	1	80	6	4.9	5
M8	eShop	eShop	eShop	1.25	90	8	6.2	6.8
M10	eShop	eShop	eShop	1.5	100	10	8	8.5
M12	eShop	eShop	eShop	1.75	110	12	9	10.2
M16	eShop	eShop	eShop	2	110	12	9	14
M20	eShop	–	–	2.5	140	16	12	17.5



Garant Blind hole machine tap left-hand thread

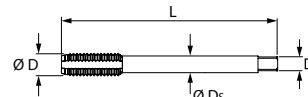
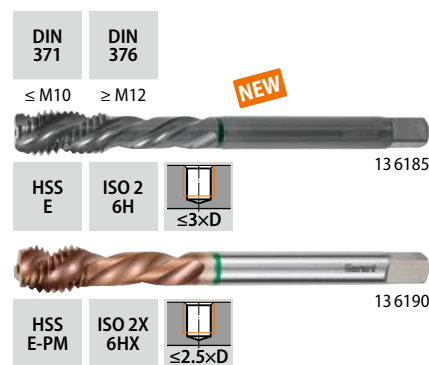
13 6185 – **GARANT Vap Tap general-purpose tap – left-hand thread.**

Can be used reliably in a **wide range of materials**. Optimised **neck and flute length** for **improved chip evacuation** when working on **deep threads**.

High-performance **HSS-E tool material** with higher **vanadium content** for improved **wear resistance**. **Surface vaporised** for reduced edge build-up.

13 6190 – **GARANT Master Tap Universal taps**, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for maximum wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 6185	18	13	18	15	15	15	6	6						6	8		15						
13 6190	30	35	20	30	30	25	12	8						10	8	20	20						

M-LH	13 6185	13 6190	Thread pitch	L	Ø D _s	□	Tapping hole Ø
	GARANT Vap Tap machine tap left-hand thread HSS-E 6H vaporised	GARANT Master Tap machine tap left-hand thread HSS-E-PM 6HX AITiX					
			mm	mm	mm	mm	mm
M3	eShop	eShop	0.5	56	3.5	2.7	2.5
M4	eShop	eShop	0.7	63	4.5	3.4	3.3
M5	eShop	eShop	0.8	70	6	4.9	4.2
M6	eShop	eShop	1	80	6	4.9	5
M8	eShop	eShop	1.25	90	8	6.2	6.8
M10	eShop	eShop	1.5	100	10	8	8.5
M12	eShop	eShop	1.75	110	9	7	10.2
M14	–	eShop	2	110	11	9	12
M16	eShop	eShop	2	110	12	9	14
M20	eShop	eShop	2.5	140	16	12	17.5
M24	eShop	eShop	3	160	18	14.5	21



Hoffmann Group

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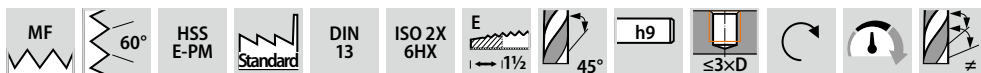
Reusing the tool saves valuable resources and avoids unnecessary waste.

A good contribution to environmental protection.



Just good all round

Pick-up and delivery service, coating service, measurement certificate service, labelling service.
An all-round worry-free package has never been so easy – and with maximum cost transparency.



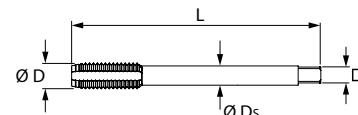
Garant GARANT Master Tap Alu blind hole machine tap

High-performance tap, specially developed for **aluminium and non-ferrous alloys**.
Dynamic helical pitch of the clamping slots ensure **optimum chip evacuation** and **process reliability**.

- **HSS-E-PM tool material** – for high cutting edge stability.
- **Ultra-smooth DLC coating** for wear resistance and avoidance of edge build-up.
- **Dynamic helical pitch of the flutes**.
- **Short lead chamfer form E**.



13 6230



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
			> 10 % Si	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30								
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
13 6230	35	32	20	20		18	18										18	25	●	●	●		

MF	13 6230	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap Alu machine tap				
	DLC	mm	mm	mm	mm
4x0,5	eShop	63	2.8	2.1	3.5
5x0,5	eShop	70	3.5	2.7	4.5
6x0,5	eShop	80	4.5	3.4	5.5
6x0,75	eShop	80	4.5	3.4	5.2
8x0,75	eShop	90	6	4.9	7.2
8x1	eShop	90	6	4.9	7
10x1	eShop	100	7	5.5	9
12x1	eShop	115	9	7	11
12x1,5	eShop	115	9	7	10.5
14x1,5	eShop	120	11	9	12.5
16x1,5	eShop	125	12	9	14.5



Blind hole machine tap

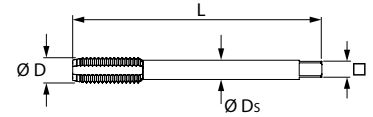
13 6250 – **Sturdy design, with 15° right-hand chip flutes.**

13 6255 – **HOLEX Clever Tap:**

Sturdy tap for conventional standard applications.

High-quality HSS-E tool material and geometry for steels.

Surface: Bronze-coloured – tempered thread profile.



13 6250



13 6255

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	N	14	16				
13 6250			13		15	15	15													●	○		
13 6255		13	13		12	12	6													●	●		

MF	11H	13 6250 Garant Machine tap	12H	13 6255 HOLEX HOLEX Clever Tap machine tap	L	Ø D _s	□	Tapping hole Ø
					mm	mm	mm	mm
4×0,5		eShop		—	63	2.8	2.1	3.5
5×0,5		eShop		eShop	70	3.5	2.7	4.5
6×0,5		—		eShop	80	4.5	3.4	5.5
6×0,75		eShop		eShop	80	4.5	3.4	5.2
8×0,5		—		eShop	80	6	4.9	7.5
8×0,75		eShop		eShop	80	6	4.9	7.2
8×1		eShop		eShop	90	6	4.9	7
9×1		eShop		—	90	7	5.5	8
10×0,75		eShop		—	90	7	5.5	9.2
10×1		eShop		eShop	90	7	5.5	9
10×1,25		eShop		eShop	100	7	5.5	8.8
11×1		eShop		—	90	8	6.2	10
12×1		eShop		eShop	100	9	7	11
12×1,25		eShop		eShop	100	9	7	10.8
12×1,5		eShop		eShop	100	9	7	10.5
14×1		eShop		eShop	100	11	9	13
14×1,25		eShop		eShop	100	11	9	12.8
14×1,5		eShop		eShop	100	11	9	12.5
15×1		eShop		—	100	12	9	14
15×1,5		eShop		—	100	12	9	13.5
16×1		eShop		eShop	100	12	9	15
16×1,5		eShop		eShop	100	12	9	14.5
18×1		eShop		eShop	110	14	11	17
18×1,5		eShop		eShop	110	14	11	16.5
18×2		eShop		—	125	14	11	16
20×1		eShop		—	125	16	12	19
20×1,5		eShop		eShop	125	16	12	18.5
22×1		eShop		—	125	18	14.5	21
22×1,5		eShop		eShop	125	18	14.5	20.5
22×2		eShop		—	140	18	14.5	20
24×1		eShop		—	140	18	14.5	23
24×1,5		eShop		eShop	140	18	14.5	22.5
25×1,5		eShop		eShop	140	18	14.5	23.5
26×1,5		eShop		—	140	18	14.5	24.5
27×1,5		eShop		—	140	20	16	25.5
27×2		eShop		—	140	20	16	25
28×1,5		eShop		—	140	20	16	26.5
30×1,5		eShop		—	150	22	18	28.5
30×2		eShop		—	150	22	18	28
32×1,5		eShop		—	150	22	18	30.5
33×1,5		eShop		—	160	25	20	31.5
35×1,5		eShop		—	170	28	22	33.5
36×1,5		eShop		—	170	28	22	34.5



13

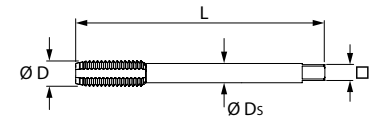


Garant Blind hole machine tap

Surface vaporised for reduced edge build-up.



13 7055



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 7055						18	9	3								4							

MF	TH	13 7055	L	Ø D _s	□	Tapping hole Ø	MF	TH	13 7055	L	Ø D _s	□	Tapping hole Ø
		Machine tap							Machine tap				
		HSS-E-PM							HSS-E-PM				
		vaporised	mm	mm	mm	mm			vaporised	mm	mm	mm	mm
5×0,5		eShop	70	3.5	2.7	4.5	14×1,5		eShop	100	11	9	12.5
8×0,75		eShop	80	6	4.9	7.2	16×1		eShop	100	12	9	15
8×1		eShop	90	6	4.9	7	16×1,5		eShop	100	12	9	14.5
10×1		eShop	90	7	5.5	9	18×1,5		eShop	110	14	11	16.5
10×1,25		eShop	100	7	5.5	8.8	20×1,5		eShop	125	16	12	18.5
12×1		eShop	100	9	7	11	22×1,5		eShop	125	18	14.5	20.5
12×1,25		eShop	100	9	7	10.8	24×1,5		eShop	140	18	14.5	22.5
12×1,5		eShop	100	9	7	10.5	26×1,5		eShop	140	18	14.5	24.5
14×1		eShop	100	11	9	13	30×1,5		eShop	150	22	18	28.5



Garant GARANT Master Tap Steel^{HT} blind hole machine tap

High-performance tap, specially developed for use in **steels with high tensile strength** and for **difficult-to-machine materials**. Sturdy design with **optimised guide thread to avoid chips jamming**.

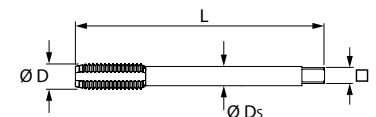
- HSS-E-PM tool material – for **very high cutting edge stability**.
- Optimised honed cutting edges.
- TiAlN coating – for **maximum wear protection**.

Recommendation: For **TOOLOX** materials we recommend deviating from the DIN data (see table) **by selecting a larger tapping hole Ø**.

Note: For **TOOLOX** materials: do not exceed the maximum thread depth of 2×D!



13 6350



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX > 900 N	Ti > 850 N					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	M	S					
13 6350					30	20	15	12	5						15	5	7	5					

MF	TH	13 6350	L	Ø D _s	□	Tapping hole Ø	MF	TH	13 6350	L	Ø D _s	□	Tapping hole Ø
		GARANT Master Tap Steel ^{HT} machine tap							GARANT Master Tap Steel ^{HT} machine tap				
		HSS-E-PM Form C 6HX							HSS-E-PM Form C 6HX				
		TiAlN	mm	mm	mm	mm			TiAlN	mm	mm	mm	mm
3×0,35		eShop	56	2.2	—	2.65	12×1,25		eShop	100	9	7	10.8
4×0,5		eShop	63	2.8	2.1	3.5	12×1,5		eShop	100	9	7	10.5
5×0,5		eShop	70	3.5	2.7	4.5	14×1,5		eShop	100	11	9	12.5
6×0,5		eShop	80	4.5	3.4	5.5	16×1,5		eShop	100	12	9	14.5
6×0,75		eShop	80	4.5	3.4	5.2	18×1,5		eShop	110	14	11	16.5
8×0,75		eShop	80	6	4.9	7.2	20×1,5		eShop	125	16	12	18.5
8×1		eShop	90	6	4.9	7	24×1,5		eShop	140	18	14.5	22.5
10×1		eShop	90	7	5.5	9	26×1,5		eShop	140	18	14.5	24.5
10×1,25		eShop	100	7	5.5	8.8	30×1,5		eShop	150	22	18	28.5
12×1		eShop	100	9	7	11							



Garant Blind hole machine tap for stainless and acid-resistant steels

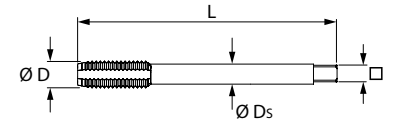
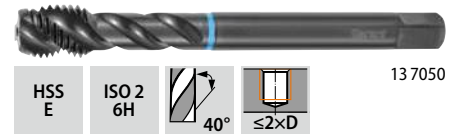
13 7050 – Surface vaporised for reduced edge build-up.

13 7053 – **GARANT Master Tap INOX:**

High-performance tap, specially developed for **good process reliability in stainless and acid-resistant steels** and **duplex materials**.

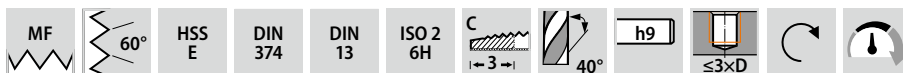
The **45° helix angle** of the flutes facilitates chip formation especially in ductile austenitic CrNi steels.

- **HSS-E-PM tool material** for a high degree of wear resistance
- The latest generation of **TiALN multi-layer coating**
- **Parameterised flute geometry** for optimum chip formation and **torsional rigidity**



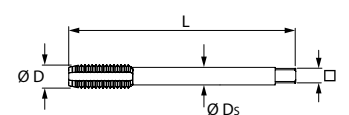
Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
13 7050		13		15	15	15							6	9			13					
13 7053		28			23	23	12						11									

MF	13 7050	13 7053	L	Ø D _s	□	Tapping hole Ø
	Machine tap	GARANT Master Tap INOX machine tap				
	HSS-E vaporised	HSS-E-PM TiALN	mm	mm	mm	mm
4x0,5	eShop	eShop	63	2.8	2.1	3.5
5x0,5	eShop	eShop	70	3.5	2.7	4.5
6x0,5	eShop	eShop	80	4.5	3.4	5.5
6x0,75	eShop	eShop	80	4.5	3.4	5.2
8x0,75	eShop	eShop	80	6	4.9	7.2
8x1	eShop	eShop	90	6	4.9	7
10x1	eShop	eShop	90	7	5.5	9
10x1,25	–	eShop	100	7	5.5	8.8
12x1	eShop	eShop	100	9	7	11
12x1,25	–	eShop	100	9	7	10.8
12x1,5	eShop	eShop	100	9	7	10.5
14x1,5	eShop	eShop	100	11	9	12.5
16x1,5	eShop	eShop	100	12	9	14.5
18x1,5	eShop	eShop	110	14	11	16.5
20x1,5	eShop	eShop	125	16	12	18.5
22x1,5	eShop	eShop	125	18	14.5	20.5
24x1,5	eShop	eShop	140	18	14.5	22.5
26x1,5	–	eShop	140	18	14.5	24.5
30x1,5	–	eShop	150	22	18	28.5



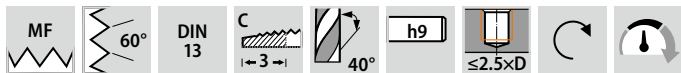
Garant GARANT Vap Tap blind hole machine tap

Can be used **reliably** in a **wide range of materials**. Optimised **neck and flute length** for **improved chip evacuation** when working on **deep threads**. High-performance **HSS-E tool material** with higher vanadium content for improved **wear resistance**. **Surface vaporised** for reduced edge build-up.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
13 7110	18	13		18	15	15	6						6			15						

MF	13 7110	L	Ø D _s	□	Tapping hole Ø	MF	13 7110	L	Ø D _s	□	Tapping hole Ø
	GARANT Vap Tap machine tap						GARANT Vap Tap machine tap				
	HSS-E vaporised	mm	mm	mm	mm		HSS-E vaporised	mm	mm	mm	mm
3x0,35	eShop	56	2.2	–	2.65	14x1,5	eShop	100	11	9	12.5
4x0,5	eShop	63	2.8	2.1	3.5	16x1,5	eShop	100	12	9	14.5
5x0,5	eShop	70	3.5	2.7	4.5	18x1,5	eShop	110	14	11	16.5
6x0,5	eShop	80	4.5	3.4	5.5	20x1,5	eShop	125	16	12	18.5
6x0,75	eShop	80	4.5	3.4	5.2	22x1,5	eShop	125	18	14.5	20.5
8x0,75	eShop	80	6	4.9	7.2	24x1,5	eShop	140	18	14.5	22.5
8x1	eShop	90	6	4.9	7	26x1,5	eShop	140	18	14.5	24.5
10x1	eShop	90	7	5.5	9	28x1,5	eShop	140	20	16	26.5
12x1	eShop	100	9	7	11	30x1,5	eShop	150	22	18	28.5
12x1,5	eShop	100	9	7	10.5						



Blind hole machine tap

13 7161 – **Tolerance class: ISO 3X/6GX.**

For components which are **galvanised** or shrink slightly when hardened.

13 7162 – With extra long shank.

13 7170 – **HOLEX Pro Tap general-purpose tap.**

Sturdy design suitable for a wide spectrum of materials.

Improved HSS-E tool material with low-friction TiN coating.

13 7160–7162 – **GARANT Master Tap Universal taps,**

designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for maximum wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

Advantage:

13 7162 – Designed for tapping threads where access is difficult.



HSS E-PM
DIN 374
ISO 2X 6HX

13 7160



HSS E-PM
DIN 374
ISO 3X 6GX

13 7161



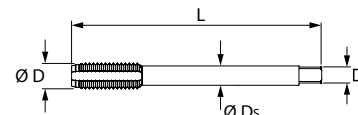
HSS E-PM
Standard
ISO 2X 6HX

13 7162



HSS E
DIN 374
ISO 2 6H

13 7170



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
13 7160/7161	30	35	20	30	30	25	12	8						10	8	20	20	●	●	●			
13 7162	24	28	16	24	24	20	10	6						8	6	16	16	●	●	●			
13 7170	24	25	10	24	20	15	8							8			15	●	●	●			

MF	13 7160	13 7161	13 7162	13 7170	L	Ø D _s	□	Tapping hole Ø
	Garant			HOLEX				
	Garant Master Tap machine tap			HOLEX Pro Tap machine tap				
	HSS-E-PM 6HX	HSS-E-PM 6GX	extra long HSS-E-PM 6HX	HSS-E 6H	13 7160 13 7161 13 7170	13 7162		
	AITiX	AITiX	AITiX	TiN	mm	mm	mm	mm
2,5x0,35	eShop	—	—	—	50	—	1.8	2.15
2,6x0,35	eShop	—	—	—	50	—	1.8	2.25
3x0,35	eShop	—	—	eShop	56	—	2.2	2.65
3,5x0,35	eShop	—	—	—	56	—	2.2	3.15
4x0,35	eShop	—	—	—	63	—	2.8	3.65
4x0,5	eShop	—	—	eShop	63	—	2.8	3.5
4,5x0,5	eShop	—	—	—	70	—	3.5	4
5x0,5	eShop	eShop	—	eShop	70	—	3.5	4.5
6x0,5	eShop	—	—	eShop	80	—	4.5	5.5
6x0,75	eShop	eShop	—	eShop	80	—	4.5	5.2
6,5x0,75	eShop	—	—	eShop	80	—	5.5	5.8
7x0,5	eShop	—	—	—	80	—	5.5	6.5
8x0,75	eShop	—	—	eShop	80	—	6	7.2
8x1	eShop	eShop	eShop	eShop	90	180	6	7
9x1	eShop	—	—	—	90	—	7	8
10x0,75	eShop	—	—	—	90	—	7	9.25
10x1	eShop	eShop	eShop	eShop	90	180	7	9
10x1,25	eShop	—	eShop	eShop	100	200	7	8.8
11x1	eShop	—	—	—	90	—	8	10
12x0,5	eShop	—	—	—	100	—	9	11.5
12x0,75	eShop	—	—	—	100	—	9	11.25
12x1	eShop	eShop	—	eShop	100	—	9	11
12x1,25	eShop	—	eShop	eShop	100	200	9	10.8
12x1,5	eShop	eShop	eShop	eShop	100	200	9	10.5
13x1	eShop	—	—	—	100	—	11	12
14x1,5	eShop	eShop	—	eShop	100	—	11	12.5
16x1,5	eShop	eShop	eShop	eShop	100	200	12	14.5
18x1	eShop	—	—	—	110	—	14	17
18x1,5	eShop	—	—	eShop	110	—	14	16.5
20x1,5	eShop	—	eShop	eShop	125	250	16	18.5
20x2	eShop	—	—	—	140	—	16	18
22x1,5	eShop	—	—	eShop	125	—	18	20.5
24x1,5	eShop	—	—	eShop	140	—	18	22.5
24x2	eShop	—	—	—	140	—	18	22
26x1,5	eShop	—	—	eShop	140	—	18	24.5
30x1,5	eShop	—	—	eShop	150	—	22	28.5



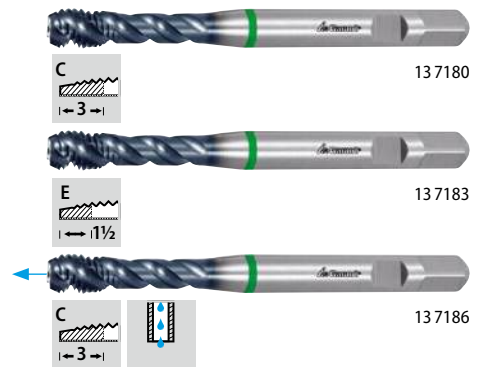
Garant Synchronised blind hole machine tap with internal coolant supply

Sturdy version with right-hand helix and shank to DIN 1835-B. Special geometry for **general-purpose use** on machines with **synchronised spindle drive**. The tap is controlled by the synchronising spindle of the machine. Special **TiAlN-S coating** for optimum tool life. For use with **emulsion** (fat content minimum 8%).

13 7183 – **Form E** (lead chamfer: 1.5 - 2 turns) for the deepest possible thread depths.

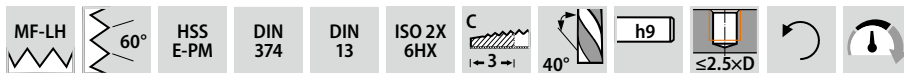
13 7186 – With **internal coolant supply** for maximum tool life.

Note: For use on **synchronised spindles**, the **GARANT** quick-change tapping chuck No. **338100 – 338121** with **minimum length adjustment (MLA)** ensures very high process reliability.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 7180–13 7186	32	32	32	33	32	20	12	7						11	9		30						

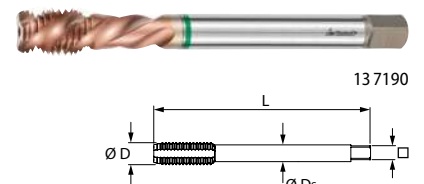
MF	13 7180	13 7183	13 7186	L	Ø D _s		Tapping hole Ø
	Machine tap for synchronised spindles						
	HSS-E-PM Form C	HSS-E-PM Form E	HSS-E-PM IC / Form C				
	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm
8×1	eShop	eShop	eShop	90	8	6.2	7
10×1	eShop	eShop	eShop	90	10	8	9
10×1,25	eShop	eShop	eShop	100	10	8	8.8
12×1	eShop	eShop	eShop	100	12	9	11
12×1,25	eShop	eShop	eShop	100	12	9	10.8
12×1,5	eShop	eShop	eShop	100	12	9	10.5
14×1,5	eShop	eShop	eShop	100	12	9	12.5
16×1,5	eShop	eShop	eShop	100	12	9	14.5
20×1,5	eShop	eShop	eShop	125	16	12	18.5



Garant GARANT Master Tap blind hole machine tap, left-hand thread

Universal taps, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for a high degree of wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
13 7190	30	35	20	30	30	25	12	8						10	8	20	20						

MF-LH	13 7190	L	Ø D _s		Tapping hole Ø
	GARANT Master Tap machine tap				
	Left-hand thread				
	AITIX	mm	mm	mm	mm
8×1	eShop	90	6	4.9	7
10×1	eShop	90	7	5.5	9
10×1,25	eShop	100	7	5.5	8.8
12×1,25	eShop	100	9	7	10.8
12×1,5	eShop	100	9	7	10.5
16×1,5	eShop	100	12	9	14.5
20×1,5	eShop	125	16	12	18.5
24×1,5	eShop	140	18	14.5	22.5



GARANT Master Tap Alu blind hole machine tap

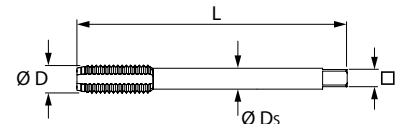
High-performance tap, specially developed for **aluminium and non-ferrous alloys**. **Dynamic helical pitch** of the clamping slots ensures **optimum chip evacuation** and **process reliability**.

- **HSS-E-PM tool material** for high cutting edge stability.
- **Ultra-smooth DLC coating** for wear resistance and avoidance of edge build-up.
- **Dynamic helical pitch of the flutes**.
- **Short lead chamfer form E**.

Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connection).

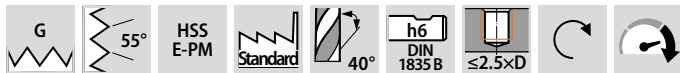


13 7310



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
13 7310	35	32	20	20		18	18										18	25					

G	13 7310	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap Alu machine tap						
	DLC		mm	mm	mm	mm	mm
G1/8	eShop	28	9.73	90	7	5.5	8.8
G1/4	eShop	19	13.16	100	11	9	11.8
G3/8	eShop	19	16.66	100	12	9	15.25
G1/2	eShop	14	20.96	125	16	12	19
G3/4	eShop	14	26.44	140	20	16	24.5
G1	eShop	11	33.25	160	25	20	30.75



GARANT Synchronised blind hole machine tap with internal coolant supply

Sturdy version with right-hand helix and shank to DIN 1835-B. Special geometry for use on machines with **synchronised spindle drives**. The tap is controlled by the synchronising spindle of the machine. With the latest generation of special **DLC coating sp²**. For use with **emulsion** (fat content minimum 8%).

13 7345 – **Form E** (lead chamfer: 1.5 - 2 turns) for the deepest possible thread depths.

13 7346 – With **internal coolant supply** for maximum tool life.

Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connection).

Note: For use on **synchronised spindles**, the **GARANT** quick-change tapping chuck **No. 338100 – 338121** with **minimum length adjustment (MLA)** ensures very high process reliability.



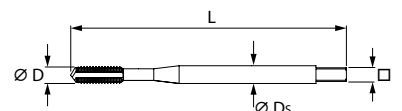
13 7344



13 7345

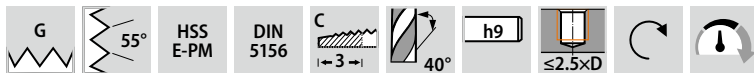


13 7346



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
13 7344–13 7346	30	35	20	25								20	25				55	35					

G	13 7344	13 7345	13 7346	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	Machine tap for synchronised spindles								
	HSS-E-PM Form C	HSS-E-PM Form E	HSS-E-PM IC / Form C						
	DLC	DLC	DLC		mm	mm	mm	mm	mm
G1/8	eShop	eShop	eShop	28	9.73	90	8	6.2	8.8
G1/4	eShop	eShop	eShop	19	13.16	100	12	9	11.8
G3/8	eShop	eShop	eShop	19	16.66	100	12	9	15.25
G1/2	eShop	eShop	eShop	14	20.96	125	16	12	19



GARANT Master Tap Steel^{HT} blind hole machine tap

High-performance tap, specially developed for use in **steels with high tensile strength** and for **difficult-to-machine materials**.

Sturdy design with **optimised guide thread to avoid chips jamming**.

■ **HSS-E-PM tool material** – for **very high cutting edge stability**.

■ **Optimised honed cutting edges**.

■ **TiAlN coating** – for **maximum wear protection**.

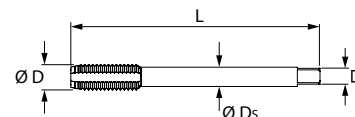
Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connection).

Recommendation: For **TOOLOX** materials we recommend deviating from the DIN data (see table) by **selecting a larger tapping hole Ø**.

Note: For **TOOLOX** materials: Do not exceed the maximum thread depth of 2xD!



13 7425



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 50 HRC	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX > 900 N	Ti > 850 N						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	H	M	S						
13 7425					30	20	15	12	5						15	5	7	5						
G	13 7425																		Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	GARANT Master Tap Steel ^{HT} machine tap																							
	HSS-E-PM Form C																							
	TiAlN																			mm	mm	mm	mm	mm
G1/8	eShop																		28	9.73	90	7	5.5	8.8
G1/4	eShop																		19	13.16	100	11	9	11.8
G3/8	eShop																		19	16.66	100	12	9	15.25
G1/2	eShop																		14	20.96	125	16	12	19
G3/4	eShop																		14	26.44	140	20	16	24.5
G1	eShop																		11	33.25	160	25	20	30.75

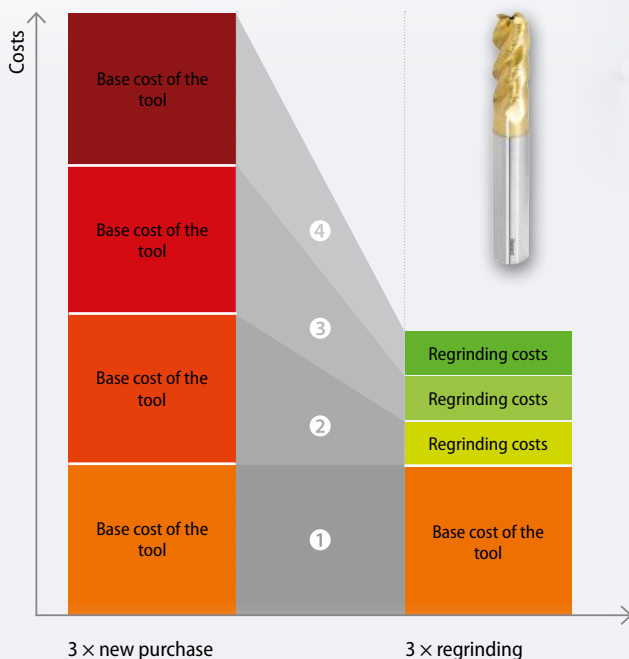


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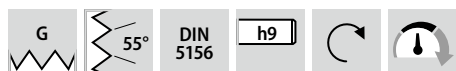
13

Garant GARANT Master Tap INOX

Developed for very high performance in stainless steel.

Discover the outstanding characteristics of the GARANT Master Tap INOX.

- **TOP chip formation**
due to optimised cutting edges.
- **TOP chip evacuation**
due to the special flute geometry.
- **TOP wear resistance**
due to high-quality HSS-E-PM tool material.
- **TOP efficiency**
due to the special micro-geometry.
- **TOP tool life**
due to the most modern TiAlN multilayer coating.


Garant MASTER TAP INOX

Garant Blind hole machine tap for stainless and acid-resistant steels

13 7450 – Surface vaporised for reduced edge build-up.

13 7752 – **Form E** (1.5-2 turns lead chamfer).

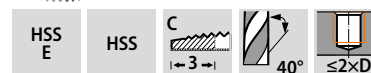
13 7750/7752 – **GARANT Master Tap INOX:**

High-performance tap, specially developed for **good process reliability in stainless and acid-resistant steels and duplex materials.**

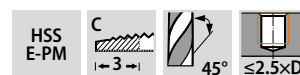
The **45° helix angle** of the chip flutes facilitates chip formation especially in ductile austenitic CrNi steels.

- **HSS-E-PM tool material** for maximum wear resistance
- The latest generation of **TiAlN multi-layer coating**
- **Parameterised flute geometry** for optimum chip formation and **torsional rigidity**

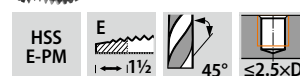
Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connection).



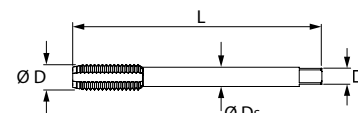
13 7450



13 7750

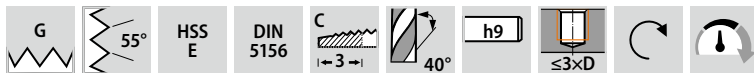


13 7752



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP	Oil	Water	Emulsion	Chamber	Chip
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
13 7450		13		15	15	15								6									
13 7750/7752		28			23	23	12							11	9		13						

G	13 7450	13 7750	13 7752	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	Machine tap	GARANT Master Tap INOX machine tap							
	HSS-E Form C vaporised	HSS-E-PM Form C TiAlN	HSS-E-PM Form E TiAlN		mm	mm	mm	mm	mm
G1/8	eShop	eShop	eShop	28	9.73	90	7	5.5	8.8
G1/4	eShop	eShop	eShop	19	13.16	100	11	9	11.8
G3/8	eShop	eShop	eShop	19	16.66	100	12	9	15.25
G1/2	eShop	eShop	eShop	14	20.96	125	16	12	19
G5/8	—	eShop	—	14	22.91	125	18	14.5	21
G3/4	eShop	eShop	eShop	14	26.44	140	20	16	24.5
G1	eShop	eShop	—	11	33.25	160	25	20	30.75



Garant GARANT Vap Tap blind hole machine tap

GARANT Vap Tap general-purpose tap.

Can be used **reliably** in a **wide range of materials**.

Optimised **neck and flute length** for **improved chip evacuation** when working on **deep threads**.

High-performance **HSS-E tool material** with higher **vanadium content** for improved **wear resistance**.

Surface vaporised for reduced edge build-up.

13 7765 – **Tolerance class ISO 228 + 0.05 mm.**

Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connection).

13 7765 – For components which are **galvanised**, or shrink slightly when hardened.

Recommendation:

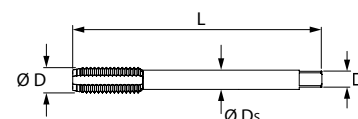
13 7765 – We recommend **deviating from the DIN data** (see table) by drilling the tapping hole **Ø 0.05mm larger**.



13 7755



13 7765



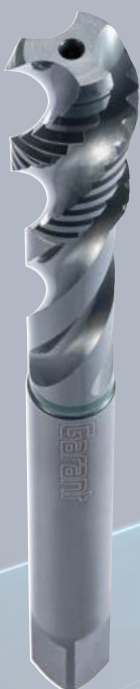
Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 7755/7765	18	13		18	15	15	6							6			15						

G	13V	13 7755	13V	13 7765	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
		GARANT Vap Tap machine tap								
		HSS-E		HSS-E						
		vaporised		ISO 228 +0.05 mm						
		vaporised		vaporised		mm	mm	mm	mm	mm
G1/8		eShop		eShop	28	9.73	90	7	5.5	8.8
G1/4		eShop		eShop	19	13.16	100	11	9	11.8
G3/8		eShop		eShop	19	16.66	100	12	9	15.25
G1/2		eShop		eShop	14	20.96	125	16	12	19
G3/4		eShop		eShop	14	26.44	140	20	16	24.5
G1		eShop		—	11	33.25	160	25	20	30.75
G1.1/8		eShop		—	11	37.9	170	28	22	35.5
G1.1/4		eShop		—	11	41.91	170	32	24	39.5
G1.1/2		eShop		—	11	47.8	190	36	29	45.25
G2		eShop		—	11	59.61	220	45	32.5	57

13

Garant

GARANT VAP TAP – THE RELIABLE SOLUTION FOR A WIDE RANGE OF MATERIALS.



- **Optimised neck and flute lengths** for improved chip evacuation when working on deep threads.
- **High-performance HSS-E tool material with higher vanadium content** for improved wear resistance.
- **A reliable process** in a wide range of materials.
- **For use across a wide spectrum of materials**, thus reducing the variety of tools that have to be stocked.

GARANT Vap Tap

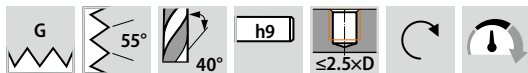
available as a set (M3; M4; M5; M6; M8; M10; M12) in a handy plastic case.

For through hole No. 14 6437 M3-12, for blind hole No. 14 6737 M3-12.



14 6437

14 6737



Blind hole machine tap

13 7806 – **HOLEX Pro Tap general-purpose tap**. Sturdy design suitable for a wide spectrum of materials. **Improved HSS-E tool material with low-friction TiN coating**.

13 7807 – With extra long shank.

13 7808 – **Form E** (1.5 – 2 turns lead chamfer).

13 7805/7808/7807 – **GARANT Master Tap Universal taps**, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for maximum wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum swarf evacuation.

Advantage:

13 7807 – Designed for tapping threads where access is difficult.

Application: For Whitworth parallel pipe threads DIN-ISO 228/1 (threads that do not form a seal within the connection).



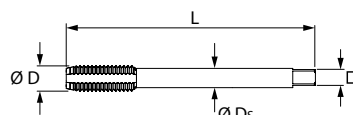
13 7805



13 7808



13 7807



13 7806

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si											INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
13 7805/7808	30	35	20	30	30	25	12	8						10	8	20	20	●	●	●			
13 7806	24	25	10	24	20	15	8							8			15	●	●	●			
13 7807	24	28	16	24	24	20	10	6						8	6	16	16	●	●	●			

G	13 7805	13 7808	13 7807	13 7806	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	Garant			HOLEX						
	GARANT Master Tap machine tap			HOLEX Pro Tap machine tap						
	HSS-E-PM Form C	HSS-E-PM Form E	extra long HSS-E-PM Form C	HSS-E Form C			13 7805 13 7808 13 7806	13 7807		
	AlTiX	AlTiX	AlTiX	TiN		mm	mm	mm	mm	mm
G1/16	eShop	—	—	—	28	7.72	90	—	6	4.9
G1/8	eShop	eShop	eShop	eShop	28	9.73	90	180	7	5.5
G1/4	eShop	eShop	eShop	eShop	19	13.16	100	200	11	9
G3/8	eShop	eShop	eShop	eShop	19	16.66	100	200	12	9
G1/2	eShop	eShop	eShop	eShop	14	20.96	125	250	16	12
G5/8	eShop	—	—	eShop	14	22.91	125	—	18	14.5
G3/4	eShop	eShop	eShop	eShop	14	26.44	140	280	20	16
G1	eShop	eShop	eShop	eShop	11	33.25	160	280	25	20

Thread gauges – Volume 2

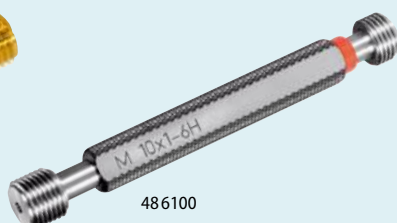


Our comprehensive ex-stock thread gauge range for many different types of threads and all popular sizes can be found in catalogue **Volume 2 – Product Group 48**.

Thread gauges for non-standard pitches, for left-hand threads and for other thread forms are available on request.



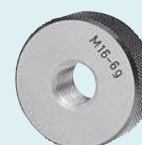
48 6008



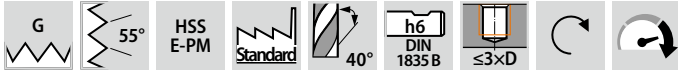
48 6100



48 6140



48 6010



Garant Synchronised blind hole machine tap with internal coolant supply

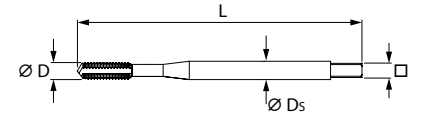
Sturdy version with right-hand helix and shank to DIN 1835-B.
Special geometry for **general-purpose use** on machines with **synchronised spindle drive**.
The tap is controlled by the synchronising spindle of the machine.
Special **TiAlN-S coating** for optimum tool life.
For use with **emulsion** (fat content minimum 8%).

13 7813 – **Form E** (lead chamfer: 1.5 - 2 turns) for the deepest possible thread depths.

13 7816 – With **internal coolant supply** for maximum tool life.

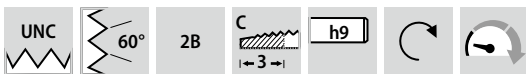
Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connection).

Note: For use on **synchronised spindles**, the **GARANT** quick-change tapping chuck **No. 338100 – 338121** with **minimum length adjustment (MLA)** ensures very high process reliability.



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	Alu cast < 65 HRC	Alu cast < 67 HRC	Alu cast < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni	Oil	Water	Emulsion	Graphite	CRP
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 7810–13 7816	32	32	32	33	32	20	12	7						11	9	30							

G	TH	13 7810	TH	13 7813	TH	13 7816	Threads per inch	Thread Ø	L	Ø D _i	□	Tapping hole Ø
		HSS-E-PM Form C		HSS-E-PM Form E		HSS-E-PM IC/ Form C		mm	mm	mm	mm	mm
		TiAlN		TiAlN		TiAlN						
G1/8		eShop		eShop		eShop	28	9.73	90	8	6.2	8.8
G1/4		eShop		eShop		eShop	19	13.16	100	12	9	11.8
G3/8		eShop		eShop		eShop	19	16.66	100	12	9	15.25
G1/2		eShop		eShop		eShop	14	20.96	125	16	12	19



Blind hole machine tap

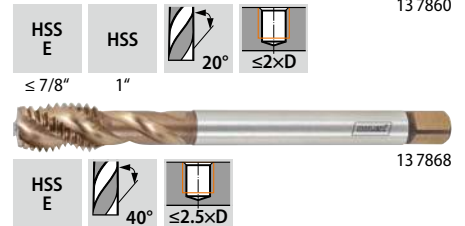
13 7860 – **Sturdy design, with 20° right-hand chip flutes.**

13 7868 – **HOLEX Clever Tap:**

Sturdy tap for conventional standard applications.
High-quality HSS-E tool material and geometry for steels.
Surface: Bronze-coloured tempered thread profile.

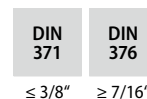
Application: For **UNC uniform coarse threads** ASME – B1.1.

DIN 371
DIN 376
≤ 3/8" ≥ 7/16"



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	Alu cast < 65 HRC	Alu cast < 67 HRC	Alu cast < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite CRP	Oil	Water	Emulsion	Graphite	CRP
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
13 7860			13	15	15																	
13 7868		13	13	12	12	6																

UNC	TH	13 7860	TH	13 7868	Threads per inch	Thread Ø	L	Ø D _i	□	Tapping hole Ø
		Garant		HOLEX		mm	mm	mm	mm	mm
		Machine tap		HOLEX Clever Tap machine tap						
4-40		eShop		eShop	40	2.84	56	3.5	2.7	2.35
5-40		eShop		–	40	3.17	56	3.5	2.7	2.65
6-32		eShop		eShop	32	3.51	56	4	3	2.85
8-32		eShop		eShop	32	4.16	63	4.5	3.4	3.5
10-24		eShop		eShop	24	4.83	70	6	4.9	3.9
12-24		eShop		–	24	5.49	80	6	4.9	4.5
1/4-20		eShop		eShop	20	6.35	80	7	5.5	5.1
5/16-18		eShop		eShop	18	7.94	90	8	6.2	6.6
3/8-16		eShop		eShop	16	9.53	100	9	7	8
7/16-14		eShop		eShop	14	11.11	100	8	6.2	9.4
1/2-13		eShop		eShop	13	12.7	110	9	7	10.8
9/16-12		eShop		–	12	14.29	110	11	9	12.2
5/8-11		eShop		eShop	11	15.88	110	12	9	13.5
3/4-10		eShop		eShop	10	19.05	125	14	11	16.5
7/8-9		eShop		–	9	22.23	140	18	14.5	19.5
1-8		eShop		–	8	25.4	160	20	16	22.25



UNC	 13 7857	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø	UNC	 13 7857	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
GARANT Master Tap INOX machine tap								GARANT Master Tap INOX machine tap							
HSS-E-PM								HSS-E-PM							
TiAIN								TiAIN							
2-56	eShop 	56	2.18	45	2.8	2.1	1.85	5/16-18	eShop 	18	7.94	90	8	6.2	6.6
4-40	eShop 	40	2.84	56	3.5	2.7	2.35	3/8-16	eShop 	16	9.53	100	9	7	8
5-40	eShop 	40	3.17	56	3.5	2.7	2.65	7/16-14	eShop 	14	11.11	100	8	6.2	9.4
6-32	eShop 	32	3.51	56	4	3	2.85	1/2-13	eShop 	13	12.7	110	9	7	10.8
8-32	eShop 	32	4.16	63	4.5	3.4	3.5	5/8-11	eShop 	11	15.88	110	12	9	13.5
10-24	eShop 	24	4.83	70	6	4.9	3.9	3/4-10	eShop 	10	19.05	125	14	11	16.5
12-24	eShop 	24	5.49	80	6	4.9	4.5	7/8-9	eShop 	9	22.23	140	18	14.5	19.5
1/4-20	eShop 	20	6.35	80	7	5.5	5.1	1-8	eShop 	8	25.4	160	18	14.5	22.2



13787

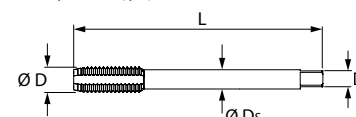
HSS E-PM 2BX DIN 371 DIN 376

$\leq 3/8"$ $\geq 1/2"$



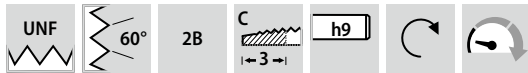
HSS E 2B DIN 371 DIN 376

$\leq 1/4"$ $\geq 5/16"$



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast Si 									INOX	INOX	GG(G)	CuZn	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N					
13 7870	30	35	20	30	30	25	12	8						10	8	20	20	●	●	●		
13 7910	24	25	10	24	20		8							8		15	15	●	●	●		

UNC	11	13 7870	12	13 7910	Threads per inch	Thread Ø	L	Ø D _s		□		Tapping hole Ø
												
	GARANT Master Tap machine tap		HOLEX Pro Tap machine tap									
	HSS-E-PM	HSS-E										
	AiTX	TiN			mm	mm	13 7870	13 7910	13 7870	13 7910	mm	
2-56	eShop 	eShop 	56	2.18	46	2.8	2.8	2.1	2.1	1.85		
3-48	eShop 	—	48	2.51	50	2.8	—	2.1	—	2.1		
4-40	eShop 	eShop 	40	2.84	56	3.5	3.5	2.7	2.7	2.35		
5-40	eShop 	—	40	3.17	56	3.5	—	2.7	—	2.7		
6-32	eShop 	eShop 	32	3.51	56	4	4	3	3	2.85		
8-32	eShop 	eShop 	32	4.16	63	4.5	4.5	3.4	3.4	3.5		
10-24	eShop 	eShop 	24	4.83	70	6	6	4.9	4.9	3.9		
12-24	eShop 	eShop 	24	5.49	80	6	6	4.9	4.9	4.5		
1/4-20	eShop 	eShop 	20	6.35	80	7	7	5.5	5.5	5.1		
5/16-18	eShop 	eShop 	18	7.94	90	8	6	6.2	4.8	6.6		
3/8-16	eShop 	eShop 	16	9.53	100	10	7	8	5.5	8		
1/2-13	eShop 	eShop 	13	12.7	110	9	9	7	7	10.8		
5/8-11	eShop 	eShop 	11	15.88	110	12	12	9	9	13.5		
3/4-10	eShop 	eShop 	10	19.05	125	14	14	11	11	16.5		
7/8-9	eShop 	eShop 	9	22.23	140	18	18	14.5	14.5	19.5		
1-8	eShop 	—	8	25.4	160	18	—	14.5	—	22.25		



Blind hole machine tap

13 8000 – **Sturdy design, with 20° right-hand chip flutes.**

13 8004 – **HOLEX Clever Tap:**

Sturdy tap for conventional standard applications.
High-quality HSS-E tool material and geometry for steels.
Surface: Bronze-coloured tempered thread profile.

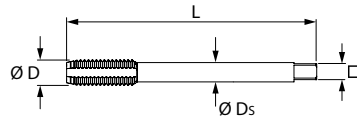
Application: For UNF uniform fine threads ASME – B1.1.



HSS E	HSS		DIN 371	DIN 374		13 8000
≤ 7/8"	1"	≤ 2.5xD	≤ 1/4"	≥ 5/16"	20°	

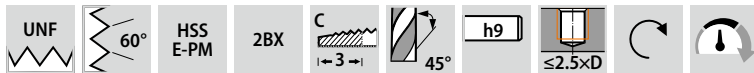


HSS E		DIN 371	DIN 374		13 8004
	≤ 2.5xD			40°	
		≤ 3/8"	≥ 7/16"		



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
13 8000					15	15	15	15	15	15	15	15	15	15	15	15	15	15					
13 8004		13	13		12	12	12	12	12	12	12	12	12	12	12	12	12	12					

UNF	1H	13 8000	12H	13 8004	Threads per inch	Thread Ø	L	Ø D _s		□		Tapping hole Ø
												
		Machine tap		HOLEX Clever Tap machine tap					13 8000	13 8004	13 8000	
					mm	mm	mm	mm	mm	mm	mm	mm
10-32		eShop		eShop	32	4.83	70	6	6	4.9	4.9	4.1
12-28		eShop		—	28	5.49	80	6	—	4.9	—	4.7
1/4-28		eShop		eShop	28	6.35	80	7	7	5.5	5.5	5.5
5/16-24		eShop		eShop	24	7.94	90	6	8	4.9	6.2	6.9
3/8-24		eShop		eShop	24	9.53	100	7	9	5.5	7	8.5
7/16-20		eShop		eShop	20	11.11	100	8	8	6.2	6.2	9.9
1/2-20		eShop		eShop	20	12.7	100	9	9	7	7	11.5
9/16-18		eShop		eShop	18	14.29	100	11	11	9	9	12.9
5/8-18		eShop		eShop	18	15.88	100	12	12	9	9	14.5
3/4-16		eShop		eShop	16	19.05	110	14	14	11	11	17.5
7/8-14		eShop		eShop	14	22.23	125	18	18	14.5	14.5	20.4
1-12		eShop		—	12	25.4	140	20	—	16	—	23.25



DIN 371	DIN 374
≤ 3/8"	≥ 7/16"

GARANT Master Tap INOX blind hole machine tap for stainless and acid-resistant steels

High-performance tap, specially developed for **good process reliability** in **stainless and acid-resistant steels** and **duplex materials**.

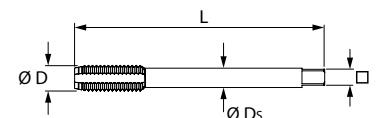
The **45° helix angle** of the flutes facilitates chip formation especially in ductile austenitic CrNi steels.

- **HSS-E-PM tool material** for maximum wear resistance
- The latest generation of **TiAlN multi-layer coating**
- **Parameterised flute geometry** for optimum chip formation and **rigidity**

Application: For UNF uniform fine threads ASME – B1.1.



13 8007



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 8007		28			23	23	12	12	12	12	12	12	12	12	11	9								

UNF	13 8007 GARANT Master Tap INOX machine tap	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø	UNF	13 8007 GARANT Master Tap INOX machine tap	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø
	HSS-E-PM TiAlN		mm	mm	mm	mm	mm		HSS-E-PM TiAlN		mm	mm	mm	mm	mm
2-64	eShop	64	2.18	45	2.8	2.1	1.85	5/16-24	eShop	24	7.94	90	8	6.2	6.9
4-48	eShop	48	2.84	56	3.5	2.7	2.4	3/8-24	eShop	24	9.53	100	9	7	8.5
5-44	eShop	44	3.17	56	3.5	2.7	2.7	7/16-20	eShop	20	11.11	100	8	6.2	9.9
6-40	eShop	40	3.51	56	4	3	2.95	1/2-20	eShop	20	12.7	100	9	7	11.5
8-36	eShop	36	4.16	63	4.5	3.4	3.5	5/8-18	eShop	18	15.88	100	12	9	14.5
10-32	eShop	32	4.83	70	6	4.9	4.1	3/4-16	eShop	16	19.05	110	14	11	17.5
12-28	eShop	28	5.49	80	6	4.9	4.7	7/8-14	eShop	14	22.23	125	18	14.5	20.4
1/4-28	eShop	28	6.35	80	7	5.5	5.5	1-12	eShop	12	25.4	140	18	14.5	23.25



Machine tap for tapered NPT pipe threads

13 8095 – HOLEX Clever Tap:

Sturdy tap for conventional standard applications. High-quality HSS-E tool material and geometry for steels. Surface: Bronze-coloured tempered thread profile.

13 8100 – For the highest performance demands.

For use with **emulsion** (fat content minimum 8%).

13 8110 – A special TiAlN coating for long tool life.

Due to **interrupted** guide thread: **reduced tapping torque** and **improved distribution of lubricant**. For use with **emulsion** (fat content minimum 8%).

Application: Tapered pipe threads (NPT) to ANSI B1.20.1, for threads with sealants. See the table for the specified minimum size of the tapping hole.

Recommendation: Tapping hole Ø A:

Pre-drill a plain hole **without using a reamer**.

Tapping hole Ø B:

Pre-drill a plain hole and then **ream it using a 1:16 taper reamer (see No. 162650)**.

The taper bore Ø can then be checked laterally by reference to the $D_{\max}$ check dimension (see table). **Variant B** for drilling the tapping hole offers the best process reliability for the tapping operation.



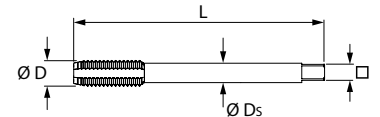
13 8095



13 8100



13 8110



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	HARDOX® 500 < 1600 N	INOX < 900 N	GG(G)	CuZn					
ISO code	N	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	K	N					
13 8095		13	13		12	12	6																
13 8100							23	13	7				4	3	2								
13 8110	13		18		17	15	12									5	14	16					

NPT	12H	11H	11H	Threads per inch	L		Ø D _s	□					
	13 8095	13 8100	13 8110		Tapping hole Ø A				Tapping hole Ø B	Thread gauge Ø D _{max} + 0.05	Tapping hole minimum depth		
	HOLEX HOLEX Clever Tap machine tap	Garant Machine tap											
	HSS-E	HSS-E-PM	HSS-E		13 8095 13 8100	13 8110							
		TiAlN	TiAlN		mm	mm	mm	mm	mm	in	mm	mm	mm
1/16-27	—	—	eShop	27	—	90	6	4.9	6.15	—	5.95	6.39	12
1/8-27	eShop	eShop	eShop	27	90	100	7	5.5	8.5	—	8.25	8.74	12
1/4-18	eShop	eShop	eShop	18	100	100	11	9	11.1	—	10.75	11.36	17.5
3/8-18	eShop	eShop	eShop	18	100	110	12	9	—	9/16	14.1	14.8	17.6
1/2-14	eShop	eShop	eShop	14	125	140	16	12	17.85	—	17.5	18.32	22.9
3/4-14	eShop	eShop	eShop	14	140	150	20	16	23.3	—	22.7	23.67	23
1-11,5	eShop	eShop	eShop	11.5	160	170	25	20	29	—	28.6	29.69	27.4



GARANT Master Tap machine tap for tapered NPT pipe threads

Universal taps, designed for use in a wide spectrum of materials with high process reliability.

- HSS-E-PM tool material for maximum wear resistance.
- Reduced coefficient of friction due to the new high-performance coating.
- Special geometry for optimum chip evacuation.

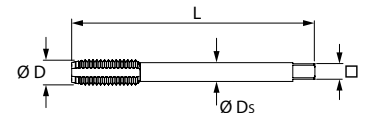
Application: Tapered pipe threads (NPT) to ANSI B1.20.1, for threads with sealants. See the table for the specified minimum size of the tapping hole.

Recommendation: Tapping hole Ø A:

Pre-drill a plain hole **without using a reamer**.

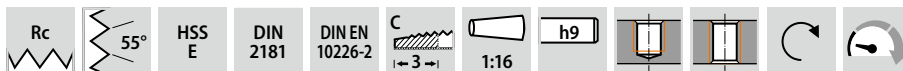
Tapping hole Ø B:

Pre-drill a plain hole and then **ream it using a 1:16 taper reamer (see No. 162650)**. The taper bore Ø can then be checked laterally by reference to the D_{max} check dimension (see table). **Variant B** for drilling the tapping hole offers the best process reliability for the tapping operation.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N							
13 8105	30	35	20	30	30	25	12	8						10	8	20	20	●	●	●				

NPT	13 8105	Threads per inch	L	Ø D _s	□					
	GARANT Master Tap machine tap					Tapping hole Ø A	Tapping hole Ø B	Thread gauge Ø D _{max} + 0.05	Tapping hole minimum depth	
	HSS-E-PM		mm	mm	mm	mm	mm	mm	mm	
	AITiX					in				
1/16-27	eShop 	27	90	6	4.9	6.15	—	5.95	6.39	12
1/8-27	eShop 	27	90	7	5.5	8.5	—	8.25	8.74	12
1/4-18	eShop 	18	100	11	9	11.1	—	10.75	11.36	17.5
3/8-18	eShop 	18	110	12	9	14.29	9/16	14.1	14.8	17.6
1/2-14	eShop 	14	125	16	12	17.85	—	17.5	18.32	22.9
3/4-14	eShop 	14	140	20	16	23.3	—	22.7	23.67	23
1-11.5	eShop 	11.5	160	25	20	29	—	28.6	29.69	27.4



GARANT Machine tap for tapered Whitworth pipe thread

The **short shank overhangs less and hence is more stable**.

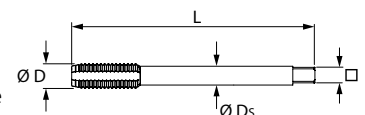
Application: For use as machine tap or for cleaning existing threads by hand. **Tapered Whitworth pipe thread (BSPT)** to ISO 7/1 and **BS21**, for joints with sealant in the thread. See the table for the specified minimum size of the tapping hole.

Recommendation: Tapping hole Ø A:

Pre-drill a plain hole **without using a reamer**. **Variant A** can be used if there is no risk of sealing problems.

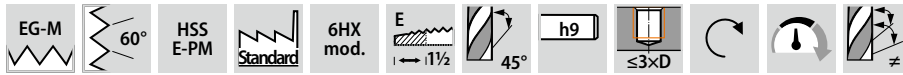
Tapping hole Ø B:

Pre-drill a plain hole and then **ream it using a 1:16 taper reamer (see No. 162650)**. The taper bore Ø can then be checked laterally by reference to the D_{max} check dimension (see table). **Variant B** for drilling the tapping hole offers the best process reliability for the tapping operation and at the same time ensures the most reliable seal in the thread.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	Alu cast < 65 HRC	Alu cast < 67 HRC	Alu cast < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
13 8120	9	9		7	6	5										5	9					

Rc	13 8120	Threads per inch	L	Ø D _s	□	Tapping hole Ø A	Tapping hole Ø B	Thread gauge Ø D _{max} JS11	Tapping hole mini- mum depth
	Machine tap		mm	mm	mm	mm	mm	mm	mm
1/8-28	eShop	28	63	7	5.5	8.15	8.1	8.57	11.1
1/4-19	eShop	19	63	11	9	10.85	10.75	11.45	16.3
3/8-19	eShop	19	70	12	9	14.3	14.25	14.95	16.7
1/2-14	eShop	14	80	16	12	17.8	17.7	18.63	22.3
3/4-14	eShop	14	100	20	16	23.2	23.1	24.12	23.6
1-11	eShop	11	110	25	20	29.2	29.1	30.29	28.3



GARANT Master Tap Alu blind hole machine tap for wire inserts

High-performance tap, specially developed for **aluminium and non-ferrous alloys**.

Dynamic helical pitch of the flutes ensures **optimum chip evacuation** and **process reliability**.

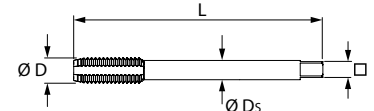
- **HSS-E-PM tool material** – for high cutting edge stability.
- **Ultra-smooth DLC coating** for wear resistance and avoidance of edge build-up.
- **Dynamic helical pitch of the flutes.**
- **Short lead chamfer form E.**

Application: For production of EG mounting thread according to metric ISO thread **DIN 8140** for **STI wire thread inserts** (Screw Thread Insert).

Note: Please be sure to observe the correct **tapping hole $\varnothing$** (see table)!
Size EG-M2 – Suitable up to thread depth $2.5 \times D$.



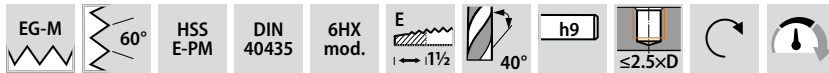
13 8205



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn				
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
13 8205	35	32	20	20		18	18										18	25				

EG-M	13 8205	Thread pitch	L	$\varnothing D_s$	$\square$	Tapping hole $\varnothing$
	GARANT Master Tap Alu machine tap for wire thread inserts					
	DLC	mm	mm	mm	mm	mm
EG-M2	eShop	0.4	50	2.8	2.1	2.15
EG-M2,5	eShop	0.45	56	3.5	2.7	2.65
EG-M3	eShop	0.5	63	4.5	3.4	3.15
EG-M4	eShop	0.7	70	6	4.9	4.2
EG-M5	eShop	0.8	80	6	4.9	5.25

EG-M	13 8205	Thread pitch	L	$\varnothing D_s$	$\square$	Tapping hole $\varnothing$
	GARANT Master Tap Alu machine tap for wire thread inserts					
	DLC	mm	mm	mm	mm	mm
EG-M6	eShop	1	90	8	6.2	6.3
EG-M8	eShop	1.25	105	10	8	8.4
EG-M10	eShop	1.5	115	9	7	10.5
EG-M12	eShop	1.75	120	11	9	12.5
EG-M16	eShop	2	140	14	11	16.5



GARANT Master Tap blind hole machine tap for wire inserts

Tap to DIN 40435 (similar to DIN 371 / DIN 376).

GARANT Master Tap Universal taps, designed for use in a wide spectrum of materials with high process reliability.

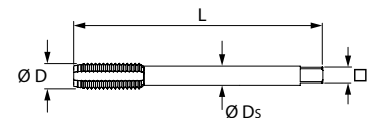
- **HSS-E-PM tool material** for maximum wear resistance.
- **Reduced coefficient of friction** due to the new high-performance coating.
- **Special geometry** for optimum swarf evacuation.

Application: For production of AC mounting thread to metric ISO threads **DIN 8140** for **STI** (Screw Thread Insert) wire thread inserts.

Note: Please ensure without fail the correct **tapping drill $\varnothing$** (see table)!



13 8210



Suitable for/ v_c [m/min]	Alu	Alu	Alu																			
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N					
13 8210	30	35	20	30	30	25	12	8						10	8	20	20					

EG-M	13 8210	Thread pitch	L	$\varnothing D_s$	$\square$	Tapping hole $\varnothing$
	GARANT Master Tap machine tap for wire thread inserts					
	HSS-E-PM					
	AITIX	mm	mm	mm	mm	mm
EG-M2	eShop	0.4	50	2.8	2.1	2.15
EG-M2,5	eShop	0.45	56	3.5	2.7	2.65
EG-M3	eShop	0.5	63	4.5	3.4	3.15
EG-M4	eShop	0.7	70	6	4.9	4.2
EG-M5	eShop	0.8	80	6	4.9	5.25
EG-M6	eShop	1	90	8	6.2	6.3

EG-M	13 8210	Thread pitch	L	$\varnothing D_s$	$\square$	Tapping hole $\varnothing$
	GARANT Master Tap machine tap for wire thread inserts					
	HSS-E-PM					
	AITIX	mm	mm	mm	mm	mm
EG-M8	eShop	1.25	100	10	8	8.4
EG-M10	eShop	1.5	100	9	7	10.5
EG-M12	eShop	1.75	110	11	9	12.5
EG-M16	eShop	2	125	14	11	16.5
EG-M20	eShop	2.5	160	18	14.5	20.75



Fluteless machine tap without oil grooves

DIN 2174 (≈ DIN 371 ≤ M10; ≈ DIN 376 ≥ M12).

13 9135/9143 – **Tolerance class:** ISO 3X / 6GX = **Oversize 0.02 – 0.04 mm.**

13 9115/9125/9135 – The **innovative polygon form** permits a wide application spectrum. The **multi-function layer structure** achieves **maximum service life** even in **high-tensile materials**.

13 9125/9130 – Size M1–M1.4 – **tolerance class:** ISO 1X / 4HX.

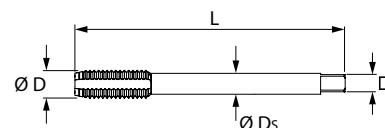
Size M1,7; M2,3; M2,6 – with old DIN profile.

13 9130/9143 – **HOLEX Pro Form:** High-performance fluteless tap for use in a **wide range of materials**.

- HSS-E-PM tool material for **high wear resistance**.
- The latest-generation **optimised HIPIMS TiN coating**.

Application:

13 9135/9143 – For components which are **galvanised after threading** or which shrink slightly when hardened.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 9115				32	27	22	17							12	7		22	●	●				
13 9125/9135	42	42		37	32	27	22	17						12			22	●	●				
13 9130/9143	20	20		27	25	25	10							8			20	●	●				

M	TH 13 9115	TH 13 9125	12 13 9130	TH 13 9135	12 13 9143	Thread pitch	L	Ø D _s	□	Tapping hole Ø guide value
	Garant		HOLEX	Garant	HOLEX					
	Fluteless machine tap without oil grooves		Pro Form fluteless machine tap without oil grooves	Fluteless machine tap without oil grooves	Pro Form fluteless machine tap without oil grooves					
	6HX TiN	6HX TiN	6HX TiN	6GX TiN	6GX TiN	mm	mm	mm	mm	mm
M1	–	eShop	eShop	–	–	0.25	40	2.5	2.1	0.9
M1,2	–	eShop	eShop	–	–	0.25	40	2.5	2.1	1.1
M1,4	–	eShop	eShop	–	–	0.3	40	2.5	2.1	1.25
M1,6	–	eShop	eShop	–	–	0.35	40	2.5	2.1	1.45
M1,7	–	eShop	eShop	–	–	0.35	40	2.5	2.1	1.55
M2	eShop	eShop	eShop	eShop	eShop	0.4	45	2.8	2.1	1.85
M2,3	–	eShop	eShop	–	–	0.4	45	2.8	2.1	2.1
M2,5	eShop	eShop	eShop	–	–	0.45	50	2.8	2.1	2.3
M2,6	–	eShop	eShop	–	–	0.45	50	2.8	2.1	2.4
M3	eShop	eShop	eShop	eShop	eShop	0.5	56	3.5	2.7	2.8
M3,5	eShop	eShop	eShop	–	–	0.6	56	4	3	3.25
M4	eShop	eShop	eShop	eShop	eShop	0.7	63	4.5	3.4	3.7
M5	eShop	eShop	eShop	eShop	eShop	0.8	70	6	4.9	4.65
M6	eShop	eShop	eShop	eShop	eShop	1	80	6	4.9	5.55
M8	eShop	eShop	eShop	eShop	eShop	1.25	90	8	6.2	7.45
M10	eShop	eShop	eShop	eShop	eShop	1.5	100	10	8	9.35
M12	eShop	eShop	eShop	eShop	eShop	1.75	110	9	7	11.2
M16	eShop	eShop	eShop	–	–	2	110	12	9	15.1



Fluteless machine tap with oil grooves

DIN 2174 (≈ DIN 371 ≤ M10; ≈ DIN 376 ≥ M12). With oil grooves; optimum lubrication effect even in deeper threads.

13 9171 – Special **TiAlN** coating, highly suitable for **aluminium alloys**.

13 9195 – **Tolerance class:** ISO 3X / 6GX = **Oversize 0.02 – 0.04 mm**.

13 9171–9180 – **Tolerance class:** ISO 2X/6HX.

13 9171/9175 – The **innovative polygon form** permits a wide application spectrum. The **multi-function layer structure** achieves **maximum service life** even in **high-tensile materials**.

13 9180/9195 – **HOLEX Pro Form:** High-performance fluteless tap for use in a **wide range of materials**.

■ HSS-E-PM cutting medium for **high wear resistance**.

■ The latest-generation **optimised HIPIMS TiN** coating.

Application:

13 9195 – For components which are **galvanised after threading** or which shrink slightly when hardened.



13 9171



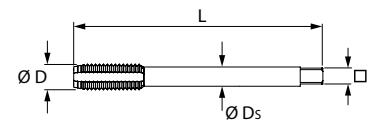
13 9175



13 9180



13 9195



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni	Oil	Water	Chips	Swarf
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
13 9171	42	42	28	32										12	7		22		●	●	●	●
13 9175				32	27	22	17							8			20		●	●	●	●
13 9180/9195	20	20		27	25	25	10											●				

M	TH 13 9171	TH 13 9175	TH 13 9180	TH 13 9195	Thread pitch	L	Ø D _s	□	Tapping hole Ø guide value
	Garant		HOLEX						
	Fluteless machine tap with oil grooves		HOLEX Pro Form fluteless machine tap with oil grooves						
	6HX TiAlN	6HX TiN	6HX TiN	6GX TiN	mm	mm	mm	mm	mm
M2	eShop	eShop	eShop	eShop	0.4	45	2.8	2.1	1.85
M2,5	eShop	eShop	eShop	–	0.45	50	2.8	2.1	2.3
M2,6	–	–	eShop	–	0.45	50	2.8	2.1	2.4
M3	eShop	eShop	eShop	eShop	0.5	56	3.5	2.7	2.8
M3,5	–	eShop	eShop	–	0.6	56	4	3	3.25
M4	eShop	eShop	eShop	eShop	0.7	63	4.5	3.4	3.7
M5	eShop	eShop	eShop	eShop	0.8	70	6	4.9	4.65
M6	eShop	eShop	eShop	eShop	1	80	6	4.9	5.55
M8	eShop	eShop	eShop	eShop	1.25	90	8	6.2	7.45
M10	eShop	eShop	eShop	eShop	1.5	100	10	8	9.35
M12	eShop	eShop	eShop	eShop	1.75	110	9	7	11.2
M14	–	eShop	–	–	2	110	11	9	13.1
M16	eShop	eShop	eShop	–	2	110	12	9	15.1



GARANT Master Form Steel fluteless machine tap with oil grooves

The latest generation of **high-performance fluteless taps**, specially developed for **use in steel materials**.

- Optimised polygon geometry for a **lower torque**.
- Multi-layer HIPIMS coating for **high wear resistance**.
- HSS-E-PM substrate for **exceptional process reliability**.

13 9198 – **Form E** (lead-in 1.5 – 2 turns) for **deep threads with short run-out**.

The thread is tapped almost to the bottom of the hole.

13 9202 – **With internal coolant feed laterally from the grooves**.

Permits the longest possible tool life when machining through holes and blind holes.

13 9205 – **Tolerance class: ISO 3X/6GX**.

13 9207 – **Tolerance class: 7GX**.

13 9194–9202/9208 – **Tolerance class: ISO 2X/6HX**.

13 9208 – With extra long shank.

13 9194–9207 – **DIN 2174** ($\approx$ DIN 371 $\leq$ M10; $\approx$ DIN 376 $\geq$ M12).

Advantage:

13 9208 – Ideal for thread forming where access is difficult.

Application:

13 9205/9207 – For components which are **galvanised**, or shrink slightly when hardened.



13 9194



13 9198



13 9202



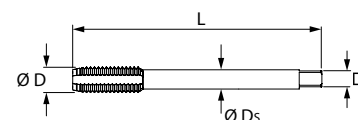
13 9205



13 9207



13 9208



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
13 9194 / 9198 13 9205 / 9207		38		37	35	27	18	12						12	7		22		●	●	●		
13 9202		42		40	38	29	20	15						15	8		25		●	●	●		
13 9208		34		33	32	24	16	10						10			20		●	●	●		

M	13 9194	13 9198	13 9202	13 9205	13 9207	13 9208	Thread pitch	L	Ø D _s	□	Tapping hole Ø guide value
	HSS-E-PM Form C 6HX	HSS-E-PM Form E 6HX	HSS-E-PM IC / Form C 6HX	HSS-E-PM Form C 6GX	HSS-E-PM Form C 7GX	extra long HSS-E-PM Form C 6HX					
	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN					
M2	eShop	eShop	—	eShop	—	—	0.4	45	—	2.8	1.85
M2,5	eShop	eShop	—	—	—	—	0.45	50	—	2.8	2.3
M3	eShop	eShop	—	eShop	eShop	eShop	0.5	56	112	3.5	2.8
M3,5	eShop	eShop	—	—	—	—	0.6	56	—	4	3.25
M4	eShop	eShop	—	eShop	eShop	eShop	0.7	63	126	4.5	3.7
M5	eShop	eShop	eShop	eShop	eShop	eShop	0.8	70	140	6	4.65
M6	eShop	eShop	eShop	eShop	eShop	eShop	1	80	160	6	5.55
M7	eShop	—	—	—	—	—	1	80	—	7	6.6
M8	eShop	eShop	eShop	eShop	eShop	eShop	1.25	90	180	8	7.45
M10	eShop	eShop	eShop	eShop	eShop	eShop	1.5	100	200	10	9.35
M12	eShop	eShop	eShop	eShop	eShop	eShop	1.75	110	220	9	11.2
M14	eShop	—	—	—	—	—	2	110	—	11	13.1
M16	eShop	eShop	eShop	eShop	—	eShop	2	110	220	12	15.1
M20	eShop	eShop	eShop	eShop	—	—	2.5	140	—	16	18.9



Garant HSS-E-PM synchronised fluteless machine tap with oil grooves

Special polygon geometry and shank to DIN 1835-B for machines with **synchronised spindle drive**.

With oil grooves; optimal lubrication effect even in deeper threads.

The **innovative polygon form** permits a wide application spectrum.

The **multi-function layered coating** achieves **maximum service life**

even in **high-tensile materials** in **fixed** applications.

139215 – **Form E** (lead-in: 1.5 – 2 turns) **for deep threads with short run-out.**

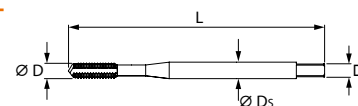
13 9230 – **With internal coolant supply laterally from the grooves; permits maximum tool life.**

Note: For use on synchronised spindles, the GARANT quick-change tapping chuck No. 338100 – 338121 with minimum length adjustment (MLA) ensures the highest process reliability.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast Si 												INOX	INOX	Ti	CuZn	Uni					
ISO code	N	N	N % Si	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N						
13 9210/9215	45	45	40	45	37	35	32	22							10			35	●	●	●			
13 9230	48	48	40	50	42	40	37	27							10			40	●	●	●			

M	11H	13 9210	11H	13 9215	11H	13 9230	Thread pitch	L	Ø D _s	□	Tapping hole Ø guide value
	Synchronised fluteless machine tap with oil grooves										
	HSS-E-PM Form C		HSS-E-PM Form E		HSS-E-PM IC/ Form C						
	TiN		TiN		TiN						
		mm		mm		mm	mm	mm	mm	mm	mm
M2,5	eShop		eShop		—		0.45	70	6	4.9	2.3
M3	eShop		eShop		—		0.5	70	6	4.9	2.8
M4	eShop		eShop		eShop		0.7	70	6	4.9	3.7
M5	eShop		eShop		eShop		0.8	70	6	4.9	4.65
M6	eShop		eShop		eShop		1	80	6	4.9	5.55
M8	eShop		eShop		eShop		1.25	90	8	6.2	7.45
M10	eShop		eShop		eShop		1.5	100	10	8	9.35
M12	eShop		eShop		eShop		1.75	110	12	9	11.2
M16	eShop		eShop		eShop		2	110	12	9	15.1



Garant Solid carbide synchronised fluteless machine tap with oil grooves

Special polygon geometry and shank to DIN 6535-HA for use on machines with **synchronised spindle drives**.

With oil grooves; optimal lubrication effect even in deeper threads.

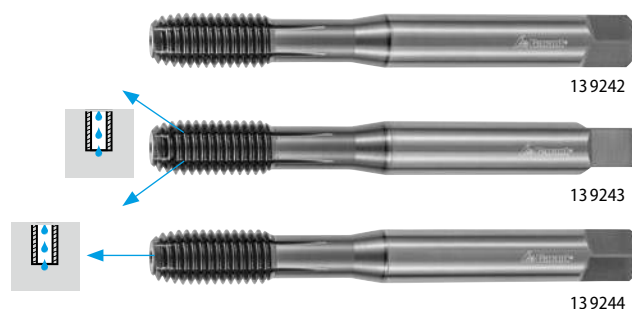
Special solid carbide tool material for high cutting speeds and long tool life.

TiAlN and anti-friction coating ensure low wear and low tendency to edge build-up.

13 9243 – **With internal coolant supply laterally from the grooves; recommended for through and blind holes.**

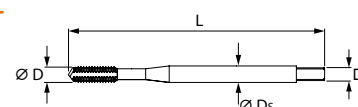
13 9244 – **With axial internal coolant supply;**
advantageous / sufficient for **blind hole** machining.

Note: For use on synchronised spindles, the GARANT quick-change tapping chuck No. 338100 – 338121 with minimum length adjustment (MLA) ensures very high process reliability.



Suitable for/ v _c [m/min]	Alu <i>plastics</i>	Alu <i>cast</i>	Alu cast > 10 % Si												INOX	INOX	Ti	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	H	M	M	S	N							
13 9242	50	50	48	52	48	45	40	33												●	●			
13 9243/9244	53	53	50	55	50	47	43	36												●	●			

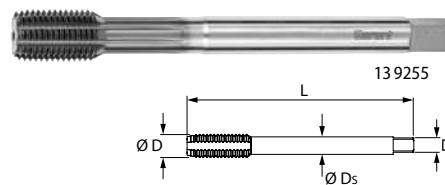
M	1H	1H	1H	Thread pitch	L	Ø D _s	□	Tapping hole Ø guide value
	13 9242	13 9243	13 9244					
	Synchronised fluteless machine tap with oil grooves							
	Solid carbide	Solid carbide IC	Solid carbide IC					
	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm
M2,5	eShop	—	—	0.45	50	6	4.9	2.3
M3	eShop	—	—	0.5	56	6	4.9	2.8
M4	eShop	—	—	0.7	63	6	4.9	3.7
M5	eShop	eShop	eShop	0.8	70	6	4.9	4.65
M6	eShop	eShop	eShop	1	80	6	4.9	5.55
M8	eShop	eShop	eShop	1.25	90	8	6.2	7.45
M10	eShop	eShop	eShop	1.5	100	10	8	9.35
M12	eShop	eShop	eShop	1.75	110	12	9	11.2





- Optimised polygon geometry for a **lower torque**.
- Multi-layer HIPIMS coating for **high wear resistance**.
- HSS-E-PM substrate for **exceptional process reliability**.

DIN 2174 ($\approx$ DIN 371 $\leq$ M10; $\approx$ DIN 376 $\geq$ M12).

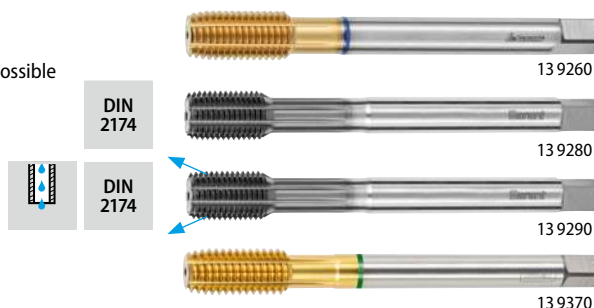


M-LH	11 13 9255 GARANT Master Form Steel fluteless machine tap with oil grooves Left-hand thread HSS-E-PM Form C 6HX TiAlN	Thread pitch	L	Ø D _s	□	Tapping hole Ø guide value
M2	eShop	0.4	45	2.8	2.1	1.85
M3	eShop	0.5	56	3.5	2.7	2.8
M4	eShop	0.7	63	4.5	3.4	3.7
M5	eShop	0.8	70	6	4.9	4.65
M6	eShop	1	80	6	4.9	5.55

M-LH	11 13 9255 GARANT Master Form Steel fluteless machine tap with oil grooves Left-hand thread HSS-E-PM Form C 6HX TiAlN	Thread pitch	L	Ø D _s	□	Tapping hole Ø guide value
M8	eShop	1.25	90	8	6.2	7.45
M10	eShop	1.5	100	10	8	9.35
M12	eShop	1.75	110	9	7	11.2
M16	eShop	2	110	12	9	15.1



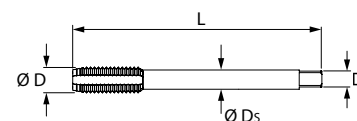
- 13 9260 – The **innovative polygon form** for a wide application spectrum. Particularly suitable for nickel-chrome steels.
- 13 9290 – With internal coolant feed laterally from the grooves. Permits the longest possible tool life when machining through holes and blind holes.
- 13 9370 – **GARANT Master Form Steel:**
The latest generation of **high-performance fluteless taps** are specially developed for **use in steels**.
- Optimised polygon geometry for a **reduced torque**.
 - Multi-layer HIPIMS coating for **high wear resistance**.
 - HSS-E-PM substrate for **top process reliability**.
- 
- A technical diagram of a tap with a polygonal cross-section. It shows a central coolant passage and lateral coolant inlets through the grooves of the flutes. A blue arrow indicates the direction of coolant flow from the center and through the side grooves. The diagram is labeled with 'GARANT' and '13 9370'.



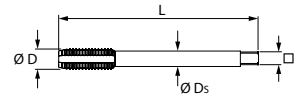
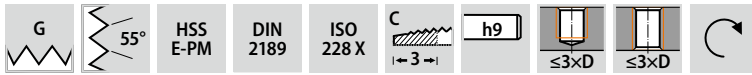
13 9260/9370 – Satisfies DIN 374.

13 9280/9290 – **GARANT Master Form Steel:**
High power fluteless taps of the latest generation, specially developed for **use in steels**.

- Optimised polygon geometry for a **reduced torque**.
- Multi-layer HIPIMS coating for **high wear resistance**.
- HSS-E-PM substrate for **top process reliability**.
- **DIN 2174** ($\approx$ **DIN 371** $\leq$ M10; **DIN 376** $\geq$ M12).



MF	11H	13 9260	11I	13 9280	11J	13 9290	12I	13 9370	L	Ø D _s	□	Tapping hole Ø guide value		
		Fluteless machine tap with oil grooves		Garant GARANT Master Form Steel fluteless machine tap with oil grooves				HOLEX HOLEX Pro Form fluteless machine tap with oil grooves						
		HSS-E-PM		HSS-E-PM		HSS-E-PM IC		HSS-E-PM		13 9260 13 9370	13 9280 13 9290	13 9260 13 9370	13 9280 13 9290	
		TiN		TiAIN		TiAIN		TiN	mm	mm	mm	mm	mm	mm
4×0,5		—		eShop		—		—	63	—	4.5	—	3.4	3.8
5×0,5		—		eShop		eShop		—	70	—	6	—	4.9	4.8
6×0,75		—		eShop		eShop		eShop	80	4.5	6	3.4	4.9	5.65
8×1		eShop		eShop		eShop		eShop	90	6	8	4.9	6.2	7.55
10×1		eShop		eShop		eShop		eShop	90	7	10	5.5	8	9.55
12×1		eShop		eShop		eShop		eShop	100	9	9	7	7	11.55
12×1,5		eShop		eShop		eShop		eShop	100	9	9	7	7	11.35
14×1,5		—		eShop		eShop		—	100	—	11	—	9	13.3
16×1,5		eShop		eShop		eShop		eShop	100	12	12	9	9	15.35
18×1,5		—		eShop		—		eShop	110	14	14	11	11	17.35
20×1,5		eShop		eShop		—		eShop	125	16	16	12	12	19.35



Fluteless machine tap with oil grooves

DIN 2189 (≈ DIN 5156). With oil grooves; optimum lubrication effect even in deeper threads.

13 9395 – Special **TiAlN coating**, highly suitable for **aluminium alloys**.

13 9425 – **With internal coolant feed** laterally from the grooves.

Permits the longest possible tool life when machining through holes and blind holes.

13 9475 – **HOLEX Pro Form**:

High-performance fluteless tap for use in a **wide range of materials**.

■ HSS-E-PM tool material for **high wear resistance**.

■ The latest-generation **optimised HiPIMS TiN coating**.

13 9395/9400 – The **innovative polygon form** permits a wide application spectrum. The **multi-function layer structure** achieves **maximum service life** even in **high-tensile materials**.

13 9415/9425 – **GARANT Master Form Steel**:

The latest generation of high-performance fluteless taps, specially developed for **use in steels**.

■ Optimised polygon geometry for a **lower torque**.

■ Multi-layer HIPIMS coating for **high wear resistance**.

■ HSS-E-PM substrate for **top process reliability**.

Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connection).



13 9395



13 9400



13 9415



13 9425



13 9475

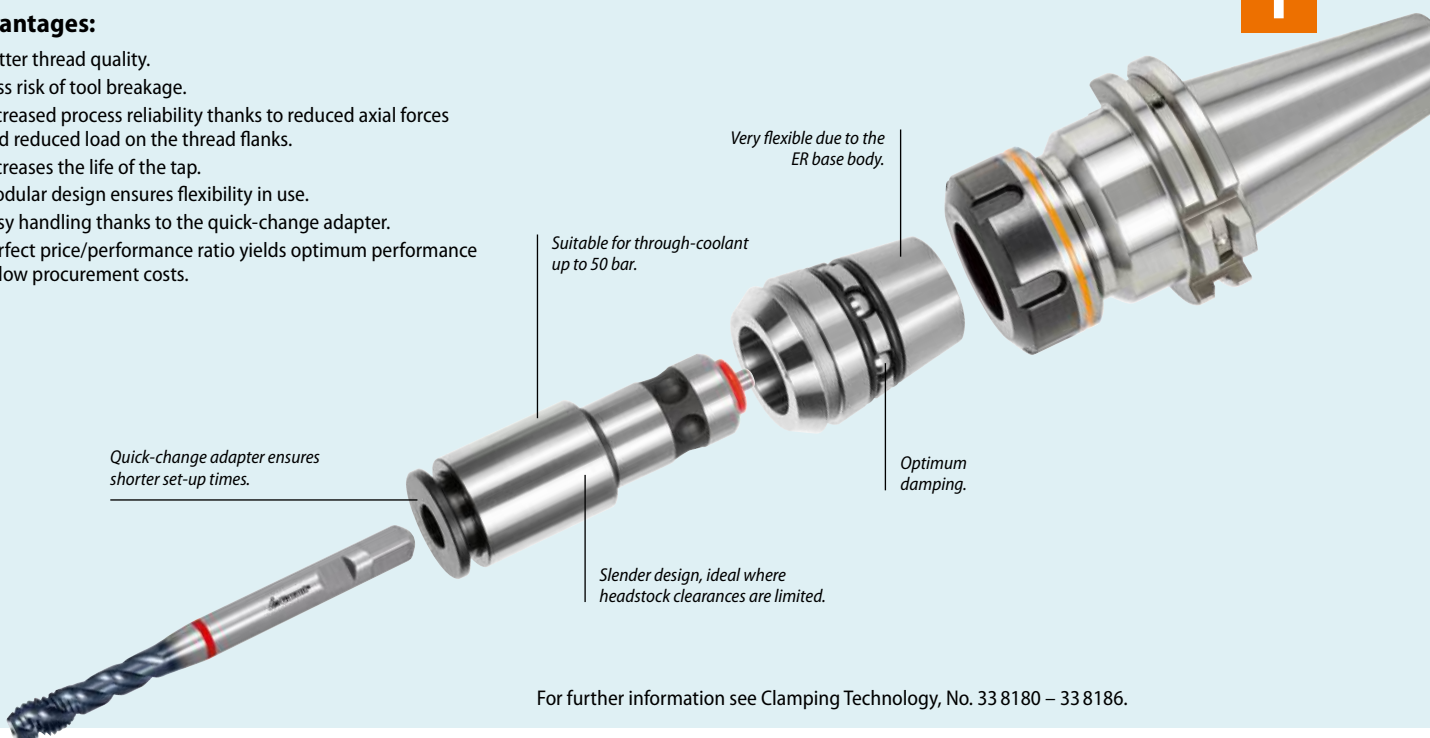
Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
13 9395	42	42	28	32																			
13 9400				32	27	22	17							12	7		22						
13 9415		38		37	35	27	18	12						12	7		22						
13 9425		42		40	38	29	20	15						15	8		25						
13 9475	20	20		27	25	25	10							8			20						

G	13 9395	13 9400	13 9415	13 9425	13 9475	Threads per inch	Thread Ø	L	Ø D _s	□	Tapping hole Ø guide value
	Garant		Garant Master Form Steel		HOLEX						
	Fluteless machine tap with oil grooves		Fluteless machine tap with oil grooves		Fluteless machine tap with oil grooves						
	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E-PM IC	HSS-E-PM						
	TiAlN	TiN	TiAlN	TiAlN	TiN		mm	mm	mm	mm	mm
G1/8	eShop	eShop	eShop	eShop	eShop	28	9.73	90	7	5.5	9.25
G1/4	eShop	eShop	eShop	eShop	eShop	19	13.16	100	11	9	12.55
G3/8	eShop	eShop	eShop	eShop	eShop	19	16.66	100	12	9	16.05
G1/2	eShop	eShop	eShop	eShop	eShop	14	20.96	125	16	12	20.05

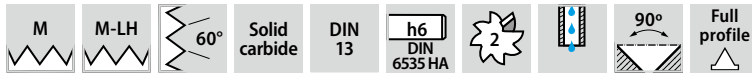
Synchro insert with ER collet base body

Advantages:

- Better thread quality.
- Less risk of tool breakage.
- Increased process reliability thanks to reduced axial forces and reduced load on the thread flanks.
- Increases the life of the tap.
- Modular design ensures flexibility in use.
- Easy handling thanks to the quick-change adapter.
- Perfect price/performance ratio yields optimum performance at low procurement costs.



For further information see Clamping Technology, No. 33 8180 – 33 8186.



Garant Micro-grain solid carbide drill thread milling cutter with countersink

Corrected thread profile for milling **exact internal threads** (ensure stable clamping conditions).

Incorporating a countersink profile for a 90° countersink. A stronger core diameter, two narrow geometrically optimised chip flutes and a special drill point result in good chip formation and low cutting pressure.

Size M4–M12 – **Internal coolant feed.**

Advantage: Drilling, countersinking and thread milling all with a single tool!

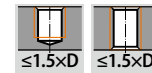
Note: HB and HE shanks are available at the same price as HA.

13 9511 – **HB** shank: order with No. **139511 + 12900 HB.**

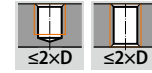
HE shank: order with No. **139511 + 12900 HE.**

13 9516 – **HB** shank: order with No. **139516 + 12900 HB.**

HE shank: order with No. **139516 + 12900 HE.**



13 9511



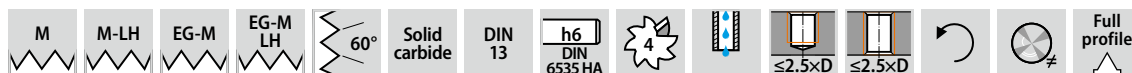
13 9516

Feed rate reference values for drilling (for aluminium castings with > 10° Si)

Size = M	M4	M5	M6	M8	M10.	M12
f = mm/rev	0.1	0.15	0.2	0.25	0.27	0.3

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	Alu cast < 65 HRC	Alu cast < 67 HRC	Alu cast < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Alu cast > 10% Si	Alu cast > 10% Si
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N		
13 9511/9516	220	220															120	330		

M	11	13 9511	11	13 9516	Thread pitch	Ø D _c	L _c		L _s		L	Ø D _s	Ø D ₁	Programming value for countersink L ₁		Width of groove e ₁	Alu cast > 10 % Si f _z
	Drill thread milling cutter						13 9511	13 9516	13 9511	13 9516				13 9511	13 9516		
	1.5×D	2×D															
	TIAlN	TIAlN															
M3	eShop	eShop	0.5	2.45	4.9	6.9	43	43	54	6	4.5	5.36	7.36	0.5	0.03		
M4	eShop	eShop	0.7	3.24	6.8	8.9	43	40	54	6	4.5	7.41	9.5	0.7	0.03		
M5	eShop	eShop	0.8	4.1	8.6	10.4	36	36	54	6	5.5	9.35	11.75	0.8	0.04		
M6	eShop	eShop	1	4.85	10.7	13.7	40	40	62	8	6.6	11.6	14.6	1	0.05		
M8	eShop	eShop	1.25	6.45	13.6	17.3	40	40	74	10	9	14.8	18.5	1.25	0.065		
M10	eShop	eShop	1.5	8.08	17.6	22.15	48	45	80	12	11	19.18	23.68	1.5	0.065		
M12	eShop	eShop	1.75	9.74	20.4	25.6	48	45	90	14	13.5	22.26	27.46	1.75	0.08		



Garant GARANT Master TM end cutting thread mill

The special front cutter geometry with **unequal spacing** permits **process-reliable circular thread milling** across a **wide spectrum of materials**. The **side cooling grooves** on the shank ensure **outstanding coolant feed** without weakening the tool core and thus offer **maximum process reliability even in unstable conditions**. All tools have left-hand cutting and are suitable for **right-hand and left-hand threads**.

- **Significantly reduced vibrations** due to **irregular cutting edge spacing**.
- **New coating** for optimum **wear resistance**.
- **Cooling grooves** on the shank for targeted **coolant feed**.
- **Corrected thread profile** for avoidance of profile distortions.

Note: HB and HE shanks are available at the same price as HA.

HB shank: order with No. **139526 + 129100 HB.**

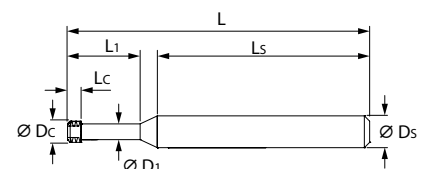
HE shank: order with No. **139526 + 129100 HE.**

Size M6 – Can also be used for thread size MF7×1 and MF8×1.

Size M10 – Can also be used for thread size MF12×1.5.



13 9526



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	TOOLOX 33 HRC	TOOLOX 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni	Alu cast > 10% Si	Alu cast > 10% Si
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N			
13 9526	220	220	180	140	130	120	90	80			85	50	82	75	50	120	200			

M	13 9526	Thread pitch	Ø D _c	L _c	L ₁	L _s	L	Ø D _s	Ø D ₁	Programming radius	Alu cast < 750 N f _z
	GARANT Master TM end cutting thread mill 2.5xD										
	AlCn	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
M3	eShop	0.5	2.33	1	8	36	58	6	1.65	1.135	0.015
M4	eShop	0.7	3.1	1.4	10.7	36	58	6	2.15	1.515	0.02
M5	eShop	0.8	3.9	1.6	13.3	36	58	6	2.8	1.913	0.025
M6	eShop	1	4.7	2	16.5	36	58	6	3.35	2.305	0.03
M8	eShop	1.25	6.4	2.5	21.25	36	62	8	4.7	3.152	0.04
M10	eShop	1.5	8.1	3	26.5	40	76	10	6.05	3.996	0.05
M12	eShop	1.75	9.8	3.5	31.75	40	76	10	7.45	4.84	0.06

Garant

Producible threads with single-profile thread mill 139620 and 139625



Article number	ISO coarse thread	ISO fine thread	UNF	UNEF	UN-16	UN-20	UNS
139620 M1 139625 M1	M1X0.25; M1.1X0.25; M1.2X0.25	M1X0.2; M1.1X0.2; M1.2X0.2					
139620 M1.4 139625 M1.4	M1.4X0.3	M1.4X0.2; M1.4X0.25					
139620 M1.6 139625 M1.6	M1.6X0.35; M1.7X0.35; M1.8X0.35	M1.6X0.2; M1.6X0.25; M1.8X0.2; M1.8X0.25					
139620 M2 139625 M2	M2X0.4; M2.3X0.4	M2X0.2; M2X0.25; M2X0.35; M2.2X0.2; M2.2X0.25; M2.2X0.35	No. 2-64				
139620 M2.5 139625 M2.5	M2.5X0.45; M2.6X0.45	M2.5X0.2; M2.5X0.25; M2.5X0.35					
139620 M3 139625 M3	M3X0.5	M3X0.2; M3X0.25; M3X0.35					No. 10-56; No. 12-56
139620 M3.5 139625 M3.5	M3.5X0.6	M3.5X0.35; M3.5X0.5					No. 10-48; No. 12-48
139620 M4 139625 M4	M4X0.7	M4X0.35; M4.5X0.35; M4X0.5; M4.5X0.5					No. 10-40; No. 12-40
139620 M5 139625 M5	M5X0.8	M5X0.35; M5X0.5		No. 12-32			No. 12-36; 1/4"-56
139620 M6 139625 M6	M6X1; M7X1	M6X0.5; M6X0.75; M6.5X0.75; M7X0.5; M8X0.5	1/4"-28	1/4"-32; 5/16"-32			1/4"-27; 1/4"-36; 1/4"-40; 1/4"-48; 5/16"-27; 5/16"-36; 5/16"-40; 5/16"-48; 3/8"-36; 3/8-40
139625 M8	M8X1.25; M9X1.25	M8X1; M9X1	3/8"-24	3/8"-32			3/8"-27; 7/16"-24; 7/16"-27
139625 M10	M10X1.5; M11X1.5	M10X0.75; M10X1; M10X1.25; M11X0.75; M11X1; M11X1.25	7/16"-20; 1/2"-20	7/16"-28; 1/2"-28			7/16"-18; 1/2"-18; 1/2"-24; 1/2"-27; 5/8"-27
139625 M12	M12X1.75	M12X1; M12X1.25; M12X1.5; M13X1; M14X1	9/16"-18; 5/8"-18	9/16"-24; 5/8"-24; 11/16"-24	1/2"-16; 9/16"-16	9/16"-20	9/16"-27; 3/4"-24; 3/4"-27; 7/8"-24; 7/8"-27; 1"-24; 1"-27
139625 M14	M14X2; M16X2	M14X1.25; M14X1.5; M14X1.75; M15X1; M16X1.5; M18X1.5; M18X2; M20X1.5; M20X2	3/4"-16; 7/8"-14	3/4"-20; 13/16"-20; 7/8"-20; 15/16"-20; 1"-20	5/8"-16; 11/16"-16; 13/16"-16; 7/8"-16; 15/16"-16; 1"-16	5/8"-20; 11/16"-20	9/16"-14; 5/8"-14; 3/4"-14; 3/4"-18; 7/8"-18; 1"-14; 1"-18



Garant

GARANT Master TM solid carbide single profile thread mill

Solid carbide thread milling cutters with irregular cutting edge spacing and an increased number of cutting edges. Due to the irregular cutting edge spacing they achieve very smooth cutting action and long tool life.

Newly developed universal geometry and high-performance coating for use across a wide spectrum of materials.

■ Significantly reduced vibration due to irregular cutting edge spacing.

■ Increased number of cutting edges.

■ Latest-generation AlTiN-based HIPIMS coating.

■ Corrected thread profile for avoidance of profile distortions.

Size M1–M3,5 – Parallel coolant channels.

Size M4–M6 – Axial cooling grooves on the shank.

Advantage: Significantly less radial pressure than with multi-tooth thread mills.

The tool can also be used for additional thread profiles (UN; UN-LH) for various pitches and diameters. See overview for possible threads.

Note: HB and HE shanks are available at the same price as HA.

HB shank: order with No. 139620 + 129100 HB.

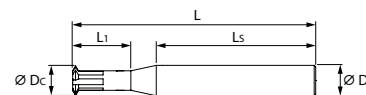
HE shank: order with No. 139620 + 129100 HE.



139620_M3



139620_M6



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 500 N	Alu cast < 500 N	Alu cast < 750 N	Alu cast < 900 N	Alu cast < 1100 N	Alu cast < 1400 N	Alu cast < 55 HRC	Alu cast < 60 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	GRP	CRP	Graphite	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	M	M	S	N	N	N	N						
139620	220	220	180	140	130	120	90	80	45	35	82	75	50	200	100	100	150						

M	11D	13 9620	Thread pitch range	Ø D _c	L _c	L _s	L ₁	L	Ø D _s	No. of teeth Z		
	GARANT Master TM solid carbide single profile thread mill											
	2xD											
	AlTiN											
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
M1		eShop	0.1 – 0.25	0.69	0.33	42	2	58	6	4	0.005	0.003
M1,4		eShop	0.14 – 0.3	1.03	0.39	42	3	58	6	4	0.008	0.004
M1,6		eShop	0.14 – 0.35	1.17	0.46	42	3.8	58	6	4	0.008	0.005
M2		eShop	0.15 – 0.4	1.51	0.53	42	4.2	58	6	4	0.008	0.007
M2,5		eShop	0.17 – 0.45	1.94	0.59	42	5.2	58	6	4	0.008	0.01
M3		eShop	0.18 – 0.5	2.38	0.66	42	6.3	58	6	4	0.01	0.02
M3,5		eShop	0.22 – 0.6	2.71	0.79	42	7.3	58	6	4	0.01	0.025
M4		eShop	0.26 – 0.7	3.1	0.93	46	8.4	58	6	6	0.02	0.03
M5		eShop	0.35 – 0.8	3.9	1.06	44.5	10.4	58	6	6	0.03	0.04
M6		eShop	0.5 – 1	4.7	1.33	42.9	12.5	58	6	6	0.04	0.05



Garant GARANT Master TM solid carbide single profile thread mill

Solid carbide thread milling cutters **with irregular cutting edge spacing and an increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth cutting action** and **long tool life**.

Newly developed universal geometry and **high-performance coating** for use across a wide spectrum of materials.

■ **Significantly reduced vibration** due to **irregular cutting edge spacing**.

■ **Increased number of cutting edges**.

■ **Latest-generation AlTiN-based HiPIMS coating**.

■ **Corrected thread profile** for avoidance of profile distortions.

Size M1–M3,5 – **Parallel coolant channels**.

Size M4–M14 – **Axial cooling grooves on the shank**.

Advantage: Significantly **less radial pressure** than with multi-tooth thread mills. The tool can also be used for additional thread profiles (UN; UN-LH) **for various pitches and diameters**. See overview for possible threads.

Note: HB and HE shanks are available at the same price as HA.

HB shank: order with No. **139625 + 129100 HB**.

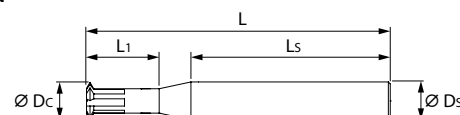
HE shank: order with No. **139625 + 129100 HE**.



139625_M3



139625_M6



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 900 N	> 900 N	> 850 N	CuZn	GRP	CRP	Graphite	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	M	M	S	N	N	N	N						
139625	200	190	160	125	115	110	80	70	45	35	75	70	45	175	100	100	150						

M	139625	Thread pitch range	Ø D _c	L _s	L ₁	L	Ø D _s	No. of teeth Z		CRP
	GARANT Master TM solid carbide single profile thread mill 3xD AlTiN	mm	mm	mm	mm	mm	mm		f _z	f _z
M1	eShop	0.1 – 0.25	0.69	42	3	58	6	4	0.005	0.003
M1,4	eShop	0.14 – 0.3	1.03	42	4.4	58	6	4	0.008	0.004
M1,6	eShop	0.14 – 0.35	1.17	42	5.6	58	6	4	0.008	0.005
M2	eShop	0.15 – 0.4	1.51	42	6.2	58	6	4	0.008	0.007
M2,5	eShop	0.17 – 0.45	1.94	42	7.7	58	6	4	0.008	0.01
M3	eShop	0.18 – 0.5	2.38	42	9.3	58	6	4	0.01	0.02
M3,5	eShop	0.22 – 0.6	2.71	42	10.8	58	6	4	0.01	0.025
M4	eShop	0.26 – 0.7	3.1	42	12.4	58	6	6	0.02	0.03
M5	eShop	0.35 – 0.8	3.9	39.5	15.4	58	6	6	0.03	0.04
M6	eShop	0.5 – 1	4.7	36.9	18.5	58	6	6	0.04	0.05
M8	eShop	0.75 – 1.25	5.95	37.6	24.6	64	6	6	0.05	0.06
M10	eShop	0.75 – 1.5	7.95	37.2	30.8	70	8	6	0.07	0.08
M12	eShop	0.8 – 1.75	9.8	42.7	36.9	82	10	6	0.08	0.1
M14	eShop	1.25 – 2	11.5	46	49	98	12	6	0.09	0.12

UNIVERSAL AND POWERFUL.

GARANT Master TM thread mill.

Unequal spacing of the cutting edges, the HiPIMS coating technology and suitable for use in a wide range of materials: these are the hallmarks of the GARANT Master TM range.

Thanks to the **innovative geometry**, the GARANT Master TM products ensure **extremely smooth cutting** and **reduced cutting forces** in the thread milling process.

These decisive advantages lead to **extremely high performance combined with absolute process reliability**. Whether in stainless steel, cast materials or high-tensile steels – thanks to their general-purpose characteristics, the GARANT Master TM family is always the **right choice for your thread milling process**.



Scan now!

You can find more information and a product demonstration on our website:
<https://hog.tools/master-tm>



Garant MASTER TM

Overview of the family



With core hole preparation



Without core hole preparation



Garant GARANT Master TM solid carbide three-profile thread mill

Solid carbide thread milling cutters **with irregular cutting edge spacing and an increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth cutting action** and **long tool life**. **Newly developed universal geometry** and **high-performance coating** for use across a wide spectrum of materials.

- **Significantly reduced vibration** due to **irregular cutting edge spacing**.
- **Increased number of cutting edges**.
- **Latest-generation AlTiN-based HIPIMS coating**.
- **Corrected thread profile** for avoidance of profile distortions.

Size M3 – **Parallel coolant channels**.

Size M4–M14 – **Axial cooling grooves on the shank**.

Advantage: Significantly **less radial pressure** than with multi-tooth thread mills.

Note: HB and HE shanks are available at the same price as HA.

HB shank: order with No. **139630 + 129100 HB**.

HE shank: order with No. **139630 + 129100 HE**.

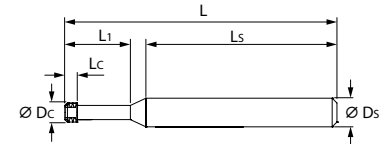
Size M14 – Can also be used for thread size M16.



13 9630_M3

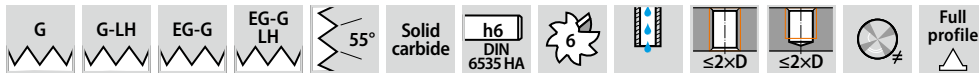


13 9630_M6



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast Si 10% 							INOX	INOX	Ti	CuZn	GRP	CRP	Graphite	Uni					
ISO code	N	N	N	P	P	P	P	P	H	M	M	S	N	N	N	N						
13 9630	200	190	160	125	115	110	80	70	45	35	75	70	45	175	100	100	150	●	●	●	●	●

M	13 9630	Thread pitch	Ø D _c	L _c	L _s	L ₁	L	Ø D _s	No. of teeth Z	CRP
	GARANT Master TM solid carbide three-profile thread mill 3×D AlTiN	mm	mm	mm	mm	mm	mm	mm		
M3	eShop	0.5	2.33	1.8	42	9.2	58	6	4	0.01
M4	eShop	0.7	3.1	2.1	42	12.3	58	6	6	0.02
M5	eShop	0.8	3.9	2.4	39.6	15.4	58	6	6	0.03
M6	eShop	1	4.7	3	36.9	18.5	58	6	6	0.04
M8	eShop	1.25	5.95	3.75	37.6	24.6	64	6	6	0.05
M10	eShop	1.5	7.95	4.5	37.2	30.7	70	8	6	0.07
M12	eShop	1.75	9.8	5.25	42.7	36.9	82	10	6	0.08
M14	eShop	2	11.5	6	46	49	98	12	6	0.09



Garant GARANT Master TM solid carbide three-profile thread mill

Solid carbide thread milling cutters **with irregular cutting edge spacing and an increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth cutting action** and **long tool life**. **Newly developed universal geometry** and **high-performance coating** for use across a wide spectrum of materials.

- **Significantly reduced vibration** due to **irregular cutting edge spacing**.
- **Increased number of cutting edges**.
- **Latest-generation AlTiN-based HIPIMS coating**.
- **Corrected thread profile** for avoidance of profile distortions.

Advantage: Significantly **less radial pressure** than with multi-tooth thread mills.

Axial cooling grooves on the shank for optimum chip evacuation.

Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connections). **Suitable for internal and external threads**.

Note: HB and HE shanks are available at the same price as HA.

HB shank: order with No. **139631 + 129100 HB**.

HE shank: order with No. **139631 + 129100 HE**.

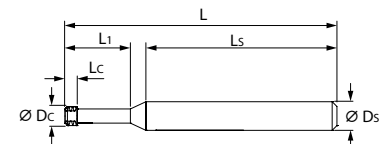
Size G1/4 – Can also be used for thread size G3/8

Size G1/2 – Can also be used for thread size G5/8 - G7/8

Size G1 – Can also be used for thread size up to ≤G2

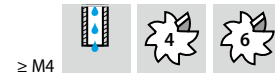
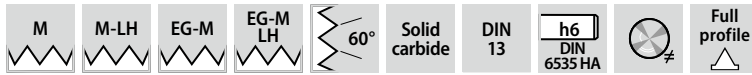


13 9631



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	GRP	CRP	Graphite	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	M	M	S	N	N	N	N						
13 9631	200	190	160	125	115	110	80	70	45	35	75	70	45	175	100	100	150	●	●	●	●	●	

G	13 9631	Threads per inch	Ø D _c	L _c	L _s	L	Ø D _s	No. of teeth Z	CRP
	GARANT Master TM solid carbide three-profile thread mill 2×D AlTiN		mm	mm	mm	mm	mm		
G1/16	eShop	28	5.95	2.72	40.6	58	6	6	0.05
G1/8	eShop	28	7.95	2.72	48.6	70	8	6	0.06
G1/4	eShop	19	9.95	4.01	53.2	82	10	6	0.08
G1/2	eShop	14	13.95	5.44	45.9	95	14	6	0.1
G1	eShop	11	15.95	6.93	49.6	112	16	6	0.12



Garant GARANT Master TM solid carbide plain shank thread mill

Solid carbide thread milling cutters with **irregular cutting edge spacing and an increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth running and long tool life**.

Newly developed universal geometry and high-performance coating for use across a wide spectrum of materials.

- **Significantly reduced vibration** due to **irregular cutting edge spacing**.
 - **Increased number of cutting edges**.
 - **The latest generation of AlTiN-based HiPIMS coating**.
 - **Corrected thread profile** for avoidance of profile distortions.
- Through-coolant feed ≥ M4**

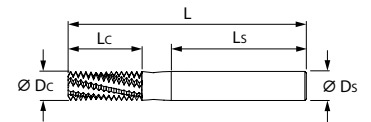
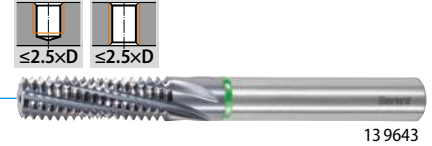
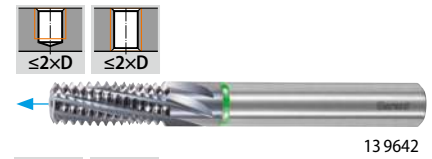
Note: HB and HE shanks are available at the same price as HA.

13 9642 – Order **HB** shank: with **No. 139642 + 129100 HB**.

Order **HE** shank: with **No. 139642 + 129100 HE**.

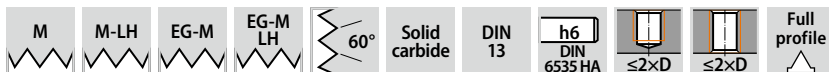
13 9643 – Order **HB** shank: with **No. 139643 + 129100 HB**.

Order **HE** shank: with **No. 139643 + 129100 HE**.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni						
ISO code	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N							
13 9642	220	220	180	140	130	120	90	80	45		85	50	82	75	50	120	200	●	●	●	●	●	
13 9643	200	190	160	125	115	110	80	70				75	70	45	105	175	●	●	●	●	●	●	

M	12J	13 9642	12J	13 9643	Thread pitch	Ø D _c	L _c	L _s	L	Ø D _s	No. of teeth Z	f _z
		GARANT Master TM plain shank thread mill										
		2xØ		2.5xØ								
		AlTiN		AlTiN	mm	mm	mm	mm	mm	mm		mm
M3		eShop		eShop	0.5	2.33	6.25	7.73	41.8	58	4	0.01
M4		eShop		eShop	0.7	3.1	8.05	10.13	38	58	4	0.02
M5		eShop		eShop	0.8	3.9	36.08	13.17	36.1	58	4	0.035
M6		eShop		eShop	1	4.7	12.5	15.47	40.9	64	4	0.05
M8		eShop		eShop	1.25	5.95	16.88	20.58	37.4	64	4	0.06
M10		eShop		eShop	1.5	7.95	20.25	26.2	36.6	68	6	0.075
M12		eShop		eShop	1.75	9.8	25.38	30.75	44	82	6	0.09
M14		eShop		eShop	2	11.5	29	37.08	49	92	6	0.1
M16		eShop		eShop	2	11.95	33	40.93	45.4	92	6	0.11
M20		eShop		eShop	2.5	13.95	41.25	51.15	45.9	102	6	0.13
M24		eShop		eShop	3	19.95	49.5	61.41	53.2	120	6	0.15



HOLEX Micro-grain solid carbide plain shank thread mill

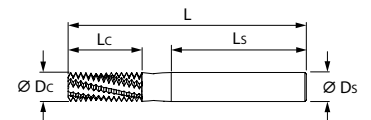
Corrected thread profile for milling **exact internal threads** (ensure stable clamping conditions).

Size M8–M20 – **Internal coolant feed**.

Note: HB and HE shanks are available at the same price as HA.

Order **HB** shank: with **No. 139651 + 129100 HB**.

Order **HE** shank: with **No. 139651 + 129100 HE**.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si 										INOX 	INOX 	Ti 	GG(G) 	CuZn 	Uni 					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
13 9651	220	220	170	170	150	120	80						80	60	60	120	180	●	●	●	●	●	

M	12J	13 9651	Thread pitch	Ø D _c	L _c	L _s	L	Ø D _s	No. of teeth Z	f _z
		Plain shank thread mill								
		2xØ								
		AlTiN	mm	mm	mm	mm	mm	mm		mm
M3		eShop	0.5	2.4	6.25	28	42	4	2	0.01
M4		eShop	0.7	3.15	8.75	36	55	6	3	0.012
M5		eShop	0.8	4	10.8	36	55	6	3	0.015
M6		eShop	1	4.8	12.5	36	55	6	3	0.02
M8		eShop	1.25	5.95	16.85	36	60	6	3	0.035
M10		eShop	1.5	7.95	21.75	36	70	8	3	0.035
M12		eShop	1.75	9.9	27.1	40	75	10	4	0.04
M14		eShop	2	11.6	31	45	85	12	4	0.045
M16		eShop	2	11.95	35	45	85	12	4	0.05
M20		eShop	2.5	13.95	41.25	48	90	16	4	0.055



Garant GARANT Master TM solid carbide plain shank thread mill with countersink

Solid carbide thread milling cutters **with irregular cutting edge spacing and an increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth running** and **long tool life**.

Newly developed universal geometry and **high-performance coating** for use across a wide spectrum of materials.

■ **Significantly reduced vibration** due to **irregular cutting edge spacing**.

■ **Increased number of cutting edges**.

■ **Latest-generation AlTiN-based HiPIMS coating**.

■ **Corrected thread profile** for avoidance of profile distortions.

Advantage: Incorporating a countersink profile for a 90° countersink and thread milling in a single operation.

Note: HB and HE shanks are available at the same price as HA.

13 9663 – Order **HB** shank: with **No. 139663 + 129100 HB**.

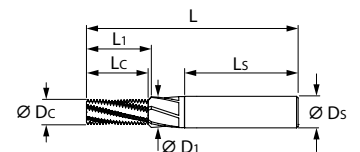
Order **HE** shank: with **No. 139663 + 129100 HE**.

13 9664 – Order **HB** shank: with **No. 139664 + 129100 HB**.

Order **HE** shank: with **No. 139664 + 129100 HE**.

13 9666 – Order **HB** shank: with **No. 139666 + 129100 HB**.

Order **HE** shank: with **No. 139666 + 129100 HE**.



13

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N							
13 9663/9666	220	220	180	140	130	120	90	80	45		85	50	82	75	50	120	200	●	●	●	●	●	
13 9664	200	190	160	125	115	110	80	70				75	70	45	105	175	●	●	●	●	●		

M	11D	13 9666	11D	13 9663	11D	13 9664	Ø D _c	L _c			L		Ø D _s	Ø D ₁	Programming value for countersink L ₁			No. of teeth Z	
	GARANT Master TM plain shank thread mill with countersink																		f _z
	1.5xD		2xD		2.5xD		13 9666	13 9663	13 9664	13 9666	13 9664				13 9666	13 9663	13 9664		
	AlTiN		AlTiN		AlTiN		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
M4	eShop		eShop		eShop		3.1	6.63	8.05	10.15	58	58	6	5	7.33	8.75	10.85	4	0.02
M5	eShop		eShop		eShop		3.9	7.57	10.8	13.2	58	64	6	5.75	8.37	11.6	14	4	0.035
M6	eShop		eShop		eShop		4.7	9.47	12.5	15.5	68	68	8	7	10.37	13.4	16.4	4	0.05
M8	eShop		eShop		eShop		6.4	13.8	16.88	20.63	75	75	10	9	14.85	17.93	21.68	4	0.06
M10	eShop		eShop		eShop		8.1	15.7	20.25	26.25	82	92	12	11	16.9	21.45	27.45	6	0.075
M12	eShop		eShop		eShop		9.8	18.32	25.38	30.63	94	94	14	13	19.67	26.73	31.98	6	0.09
M14	eShop		eShop		eShop		11.5	22.94	29	35	106	106	16	15	24.44	30.5	36.5	6	0.1
M16	eShop		eShop		eShop		13.4	24.94	33	41	108	108	18	17	26.49	34.55	42.55	6	0.11



Garant GARANT Master TM solid carbide plain shank thread mill

Solid carbide thread milling cutters with **irregular cutting edge spacing** and an **increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth running** and **long tool life**.

Newly developed universal geometry and **high-performance coating** for use across a wide spectrum of materials.

- **Significantly reduced vibration** due to **irregular cutting edge spacing**.
- **Increased number of cutting edges**.
- **The latest generation of AlTiN-based HiPIMS coating**.
- **Corrected thread profile** for avoidance of profile distortions.

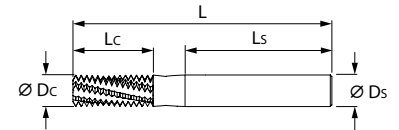
Through-coolant feed $\geq 4 \times 0.5$

Note: HB and HE shanks are available at the same price as HA.
Order **HB** shank: with No. **139675 + 129100 HB**.
Order **HE** shank: with No. **139675 + 129100 HE**.

Size 20x1,5 – Can also be used for thread size M24 x 1.5 and M30 x 1.5.

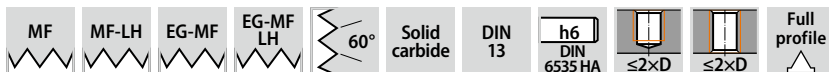


139675



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
139675	220	220	180	140	130	120	90	80	45	45	85	50	82	75	50	120	200						

MF	11D	139675	Ø D _c	L _c	L _s	L	Ø D _s	No. of teeth Z	f _z
		GARANT Master TM plain shank thread mill							
		2xD							
		AlTiN	mm	mm	mm	mm	mm		mm
3x0,35		eShop	2.45	6.13	41.8	58	6	4	0.01
4x0,5		eShop	3.29	8.25	38.1	58	6	4	0.02
5x0,5		eShop	4.1	10.25	37.1	58	6	4	0.035
6x0,75		eShop	4.9	12.38	36.5	58	6	4	0.05
8x0,75		eShop	5.95	16.13	38.7	64	6	4	0.06
8x1		eShop	5.95	16.5	38	64	6	4	0.06
10x1		eShop	7.95	20.5	36.4	68	8	6	0.075
10x1,25		eShop	7.95	20.63	36.4	68	8	6	0.075
12x1		eShop	9.95	24.5	45.7	82	10	6	0.09
12x1,5		eShop	9.95	24.75	45	82	10	6	0.09
14x1,5		eShop	11.95	29.25	49.6	92	12	6	0.1
16x1,5		eShop	13.9	32.25	47.7	94	14	6	0.11
18x1,5		eShop	15.9	36.75	54.4	106	16	6	0.11
20x1,5		eShop	15.95	41.25	49.9	106	16	6	0.13



HOLEX Micro-grain solid carbide plain shank thread mill

Corrected thread profile for milling **exact internal fine threads** (ensure stable clamping conditions).

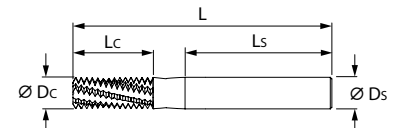
Size 8x1–20x1,5 – **Internal coolant feed**.

Note: HB and HE shanks are available at the same price as HA.
Order **HB** shank: with No. **139680 + 129100 HB**.
Order **HE** shank: with No. **139680 + 129100 HE**.

Size 20x1,5 – Can also be used for thread size M24 x 1.5.

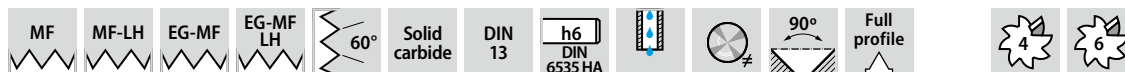


139680



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
139680	220	220	170	170	150	120	80						80	60	60	120	180						

MF	12J	139680	Ø D _c	L _c	L _s	L	Ø D _s	No. of teeth Z	f _z
		Plain shank thread mill							
		2xD							
		AlTiN	mm	mm	mm	mm	mm		mm
5x0,5		eShop	4	10.25	36	55	6	3	0.018
6x0,75		eShop	4.8	12.38	36	55	6	3	0.02
8x1		eShop	5.95	16.5	36	60	6	3	0.035
10x1		eShop	7.95	20.5	36	70	8	3	0.035
10x1,25		eShop	7.95	20.6	36	70	8	3	0.035
12x1		eShop	7.95	26.5	40	75	10	4	0.04
12x1,5		eShop	9.9	26.2	40	75	10	4	0.04
14x1,5		eShop	11.6	30.7	45	85	12	4	0.045
16x1,5		eShop	11.95	33.7	45	85	12	4	0.05
18x1,5		eShop	13.95	41.2	45	90	14	4	0.05
20x1,5		eShop	15.95	41.2	48	90	16	4	0.055



Garant GARANT Master TM solid carbide plain shank thread mill with countersink

Solid carbide thread milling cutters **with irregular cutting edge spacing and an increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth running** and **long tool life**.

Newly developed universal geometry and **high-performance coating** for use across a wide spectrum of materials.

- **Significantly reduced vibration** due to **irregular cutting edge spacing**.
- **Increased number of cutting edges**.
- **The latest generation of AlTiN-based HiPIMS coating**.
- **Corrected thread profile** for avoidance of profile distortions.

Advantage: Incorporating a countersink profile for a 90° countersink and thread milling in a single operation.

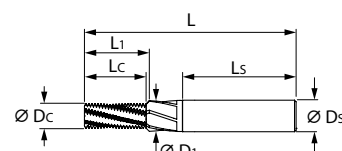
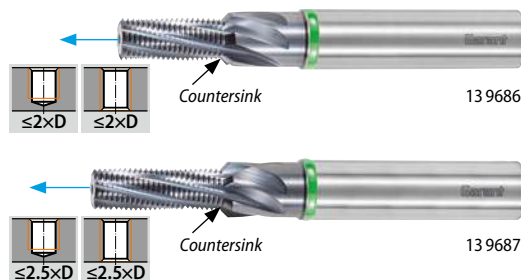
Note: HB and HE shanks are available at the same price as HA.

13 9686 – Order **HB** shank: with **No. 139686 + 129100 HB**

Order **HE** shank: with **No. 139686 + 129100 HE**

13 9687 – Order **HB** shank: with **No. 139687 + 129100 HB**

Order **HE** shank: with **No. 139687 + 129100 HE**



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast 10% Si 							TOOLX [®] 33 HRC	TOOLX [®] 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
13 9686	220	220	180	140	130	120	90	80	45	85	50	82	75	50	120	200						
13 9687	200	190	160	125	115	110	80	70				75	70	45	105	175						

MF	11D	13 9686	11D	13 9687	Ø D _c	L _c			L _s		L		Ø D _s	Ø D ₁	Programming value for countersink L ₁		No. of teeth Z	 f _z
	GARANT Master TM plain shank thread mill with countersink					13 9686	13 9687	13 9686	13 9687	13 9686	13 9687	13 9686			13 9687			
	2×D		2.5×D															
	AITIN		AITIN															
					mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm
4×0,5		eShop		eShop	3.29	8.25	10.25	38.1	36.2	58	58	6	5	8.86	10.86	4	0.02	
5×0,5		eShop		eShop	4.1	10.25	13.25	37.1	40.1	58	64	6	5.75	10.95	13.95	4	0.035	
6×0,75		eShop		eShop	4.9	12.38	15.38	42.3	39.3	68	68	8	7	13.18	16.18	4	0.05	
8×0,75		eShop		eShop	6.8	16.13	20.63	43	40	75	75	10	9	16.98	21.48	4	0.06	
8×1		eShop		eShop	6.6	16.5	20.5	43.7	40	75	75	10	9	17.45	21.45	4	0.06	
10×1		eShop		eShop	8.5	20.5	25.5	45.7	50.7	82	92	12	11	21.5	26.5	6	0.075	
12×1		eShop		eShop	10.4	24.5	30.5	52.8	46.8	94	94	14	13	25.55	31.55	6	0.09	
12×1,5		eShop		eShop	10	24.75	30.75	52	46	94	94	14	13	26	32	6	0.09	
16×1.5		eShop		eShop	13.9	32.25	41.25	57.1	48.1	108	108	18	17	33.55	42.55	6	0.11	

Garant **GARANT MASTER TM THREAD MILLS IN PERFECTION**

Thanks to their unequal spacing of cutting edges, the new GARANT Master TM solid carbide thread milling cutters set new standards for thread milling.

Green ring

- For general applications.

Innovative coating

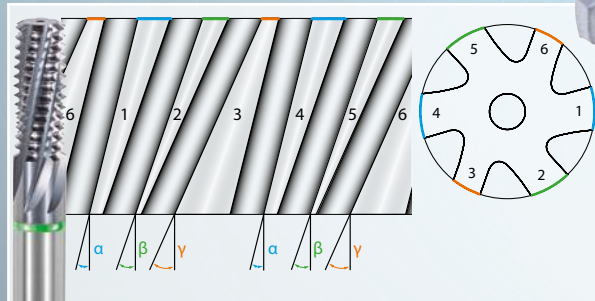
- The latest coating technology for optimum protection against wear.
- High performance over a wide spectrum of materials.

Corrected thread profile

- Avoidance of profile distortion.
- Threads true to gauge and true to standard.

Unequal spacing

- Significant reduction in vibration.
- Very smooth cutting action.
- Reduction in the cutting forces avoids tool displacement.



**Optimised
solid carbide substrate**

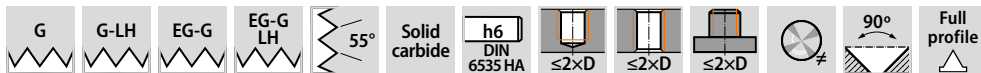
- Improved bending strength.
- High tool strength.

Increased number of cutting edges

- More efficiency due to increased contour feed rate.

Your advantages at a glance:

- Long tool life due to optimum cutting characteristics.
- Shorter machining times due to more cutting edges.
- Optimum protection against wear due to new high-performance coating.
- High surface quality of the thread.
- Precise threads due to profile correction.
- Reduction in the variety of tools required, thanks to good general-purpose capabilities.



GARANT Master TM solid carbide plain shank thread mill with countersink

Solid carbide thread milling cutters **with irregular cutting edge spacing and an increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth running and long tool life**.

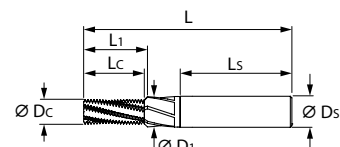
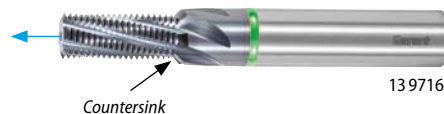
Newly developed universal geometry and high-performance coating for use across a wide spectrum of materials.

- **Significantly reduced vibration** due to **irregular cutting edge spacing**.
- **Increased number of cutting edges**.
- **The latest generation of AlTiN-based HiPIMS coating**.
- **Corrected thread profile** for avoidance of profile distortions.

Advantage: Incorporating a countersink profile for a 90° countersink and thread milling in a single operation.

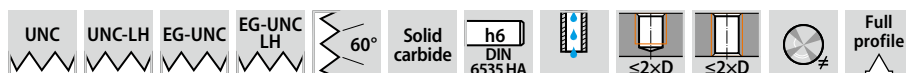
Application: For **Whitworth parallel pipe threads** DIN-ISO 228/1 (threads that do not form a seal within the connections). **Suitable for internal and external threads**.

Note: HB and HE shanks are available at the same price as HA.
Order **HB** shank: with No. **139716 + 129100 HB**.
Order **HE** shank: with No. **139716 + 129100 HE**.



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si								TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
	220	220	180	140	130	120	90	80	45		85	50	82	75	50	120	200	●		●	●		●

G	11D	13 9716	Threads per inch	Ø D _c	L _c	L _s	L	Ø D _s	Ø D ₁	Programming val- ue for countersink L ₁	No. of teeth Z	 < 750 N f _z
		GARANT Master TM plain shank thread mill with countersink										
		2xD										
		AlTiN		mm	mm	mm	mm	mm	mm	mm		mm
G1/8		eShop	28	8.1	19.5	47	82	12	11	22.57	4	0.075
G1/4		eShop	19	11	27.41	50.4	94	14	13.8	28.74	6	0.1
G3/8		eShop	19	14.4	34.09	55.8	108	18	17.5	35.47	6	0.11



GARANT Master TM solid carbide plain shank thread mill

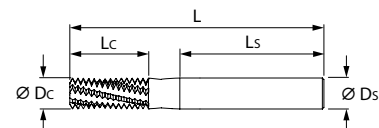
Solid carbide thread milling cutters **with irregular cutting edge spacing and an increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth running and long tool life**.

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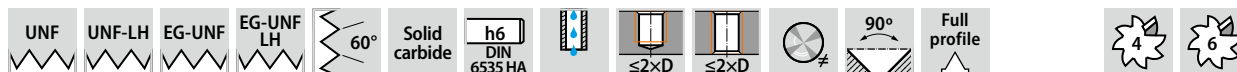
Application: For **UNC unified coarse threads** ASME-B1.1.

Note: HB and HE shanks are available at the same price as HA.
Order **HB** shank: with No. **139732 + 129100 HB**.
Order **HE** shank: with No. **139732 + 129100 HE**.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 50 HRC	 < 55 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
13 9732	220	220	180	140	130	120	90	80	45		85	50	82	75	50	120	200	●		●	●		●

UNC	11D	13 9732	Threads per inch	Ø D _c	L _c	L _s	L	Ø D _s	No. of teeth Z	 < 750 N f _z
		GARANT Master TM plain shank thread mill								
		2xD								
		AlTiN		mm	mm	mm	mm	mm		mm
10-24		eShop	24	3.55	10.02	36.2	58	6	4	0.03
1/4-20		eShop	20	4.7	13.29	39.8	64	6	4	0.05
5/16-18		eShop	18	5.95	16.18	38	64	6	4	0.06
3/8-16		eShop	16	7.5	19.8	36.5	68	8	4	0.07
7/16-14		eShop	14	7.95	22.6	36	70	8	6	0.08
1/2-13		eShop	13	9.95	26.31	43.1	82	10	6	0.09
9/16-12		eShop	12	11.6	28.51	49.6	92	12	6	0.1
5/8-11		eShop	11	11.95	33.39	45	92	12	6	0.11
3/4-10		eShop	10	13.95	39.31	47.8	102	14	6	0.13
7/8-9		eShop	9	15.95	46.43	48	110	16	6	0.14
1-8		eShop	8	19.95	52.26	50.3	120	20	6	0.15



Garant GARANT Master TM solid carbide plain shank thread mill with countersink

Solid carbide thread milling cutters **with irregular cutting edge spacing and an increased number of cutting edges**. Due to the **irregular cutting edge spacing** they achieve very **smooth running** and **long tool life**.

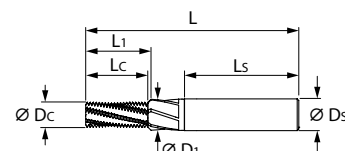
Newly developed universal geometry and **high-performance coating** for use across a wide spectrum of materials.

- **Significantly reduced vibration** due to **irregular cutting edge spacing**.
- **Corrected thread profile** for avoidance of profile distortions.
- **Increased number of cutting edges**.
- **The latest generation of AlTiN-based HiPIMS coating**.

Advantage: Incorporating a countersink profile for a 90° countersink and thread milling in a single operation.

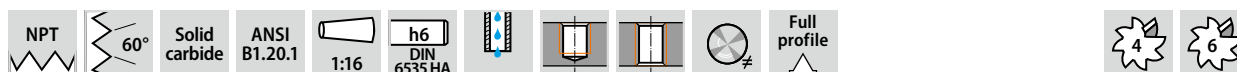
Application: For **UNF unified fine threads** ASME-B1.1.

Note: HB and HE shanks are available at the same price as HA
Order **HB** shank: with **No. 139738 + 129100 HB**
Order **HE** shank: with **No. 139738 + 129100 HE**



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast Si > 10% 	Alu cast Si > 10% 							TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX ≤ 900 N	INOX ≥ 900 N	Ti ≥ 850 N	GG(G) K	CuZn N	Uni ●					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	S	S	K	N	●					
13 9738	220	220	180	140	130	120	90	80	45	85	50	82	75	50	120	200	●	●	●	●	●	●

UNF	TID	13 9738	Threads per inch	Ø D _c	L _c	L _s	L	Ø D _s	Ø D ₁	Programming value for countersink L ₁	No. of teeth Z	 f_z < 750 N
		GARANT Master TM plain shank thread mill with countersink										
		2xD										
		AlTiN										
				mm	mm	mm	mm	mm	mm	mm		mm
10-32		eShop	32	3.81	9.1	36.8	58	6	5.75	9.86	4	0.04
1/4-28		eShop	28	5.1	13.12	41.4	68	8	7	14	4	0.05
5/16-24		eShop	24	6.5	16.36	43.7	75	10	9	17.33	4	0.07
3/8-24		eShop	24	8	19.54	46.3	82	12	11	20.55	4	0.08
7/16-20		eShop	20	9.3	23.45	53.4	92	12	11.75	24.61	6	0.09
1/2-20		eShop	20	10.9	25.99	51.8	94	14	13.5	27.14	6	0.1
9/16-18		eShop	18	12.3	27.88	59.4	106	16	15	29.12	6	0.1
5/8-18		eShop	18	13.9	33.11	56.3	108	18	17	34.35	6	0.11
3/4-16		eShop	16	16.8	38.85	62.7	120	20	19.75	40.23	6	0.13



Garant GARANT Master TM solid carbide plain shank thread mill

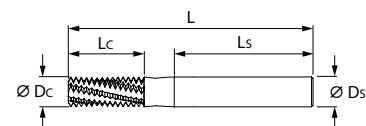
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- **Corrected thread profile** for avoidance of profile distortions.

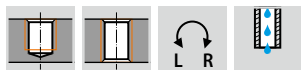
Application: Tapered pipe threads (NPT) to ANSI B1.20.1, for threads with sealants.

Note: HB and HE shanks are available at the same price as HA.
Order **HB** shank: with **No. 139739 + 129100 HB**.
Order **HE** shank: with **No. 139739 + 129100 HE**.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast Si 								TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX HRC	INOX HRC	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	S	K	N						
13 9739	220	220	180	140	130	120	90	80	45		85	50	82	75	50	120	200	●	●	●	●	●	●

NPT	11D	Threads per inch	Ø D _c	L _c	L _s	L	Ø D _s	No. of teeth Z	 < 750 N f _z
	13 9739								
	GARANT Master TM plain shank thread mill								
	AITiN		mm	mm	mm	mm	mm		mm
1/16-27	eShop	27	5.39	8.93	39.3	58	6	4	0.08
1/8-27	eShop	27	7.39	8.93	48.1	68	8	6	0.09
1/4-18	eShop	18	9.11	13.39	49	75	10	6	0.1
3/8-18	eShop	18	11.11	13.38	55	82	12	6	0.11
1/2-14	eShop	14	12.88	17.2	61.9	94	14	6	0.13

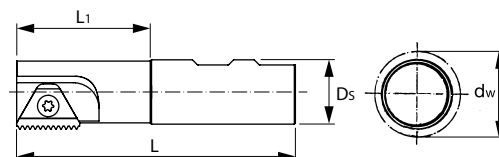


Garant Indexable thread mill

- Application:**
- For parallel **internal** and **external threads**; other inserts and taper thread tools available on request.
 - For threads in **through holes** and **blind holes**.
 - For universal use cutting **left-hand** and **right-hand threads**.
 - No chip clearance problems, since only short chips are produced.
 - Low cutting pressure.

Note:

Size 22/25–37/98 – Version with double HB drive flat.



Effective $\varnothing D_w$ / Overhang L_1	21R	21 8000	Insert size	L	$\varnothing D_s$	Clamping screw
mm		Indexable thread mill Weldon shank		mm	mm	
11,5/12		eShop	11	70	12	219923
11,5/20		eShop	11	85	20	219923
17/22		eShop	16	90	16	279810 5
20/43		eShop	16	95	20	279810 5
22/25		eShop	16	125	25	279810 5
30/52		eShop	27	110	25	219925
30/92		eShop	27	150	25	219925
37/58		eShop	27	120	32	219925
37/98		eShop	27	160	32	219925

Full
profile

Garant Thread milling inserts for thread mill No. 218000

Sturdy inserts. **Two usable edges**.

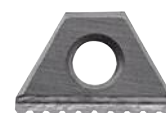
- Wide range of applications thanks to universal chip breaker geometry.
- High repetition accuracy.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
21 8005–21 8024	140	120	80	120	110	100	80	60						80	70	70	120	●	●				



Application:

- 21 8005 Size 2 – **For metric internal coarse threads** to DIN / ISO (DIN 13) **M14, M16**.
 21 8015 – **For metric external threads** to DIN / ISO (DIN 13) tolerance class 6g.
 21 8005–8009 – **For metric internal threads** to DIN / ISO (DIN 13) tolerance class 6H.

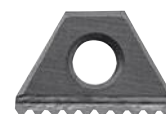


Pitch	mm	0,5	1	1,25	1,5	1,75	2	2,5	3	3,5	4	Insert size mm	INOX < 1100 N f_z mm	INOX < 900 N f_z mm
21D 21 8005		eShop	eShop	–	eShop	–	eShop	–	–	–	–	11	0.1	0.05
21D 21 8007	Thread milling insert for internal threads 60°	–	eShop	eShop	eShop	eShop	eShop	–	–	–	–	16	0.1	0.05
21D 21 8009		–	–	–	eShop	–	eShop	eShop	eShop	eShop	eShop	27	0.1	0.05
21D 21 8015	Thread milling insert for external threads 60°	–	eShop	eShop	eShop	–	eShop	–	–	–	–	16	0.1	0.05

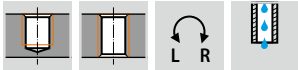


Application:

For internal and external threads 55° to standard BS 84: 1956, DIN 259, ISO 228/1:1982. Tolerance medium, class A.



Threads per inch		11	14	19	Insert size mm	INOX < 1100 N f_z mm	INOX < 900 N f_z mm
21D 21 8020		–	eShop	eShop	11	0.1	0.05
21D 21 8022	Thread milling insert for internal and external threads 55°	eShop	eShop	–	16	0.1	0.05
21D 21 8024		eShop	–	–	27	0.1	0.05



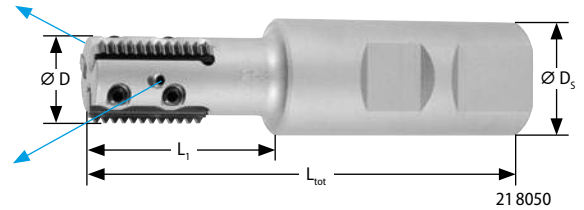
Garant High performance indexable thread mills HPC

HPC thread milling cutters for reduced machining times.

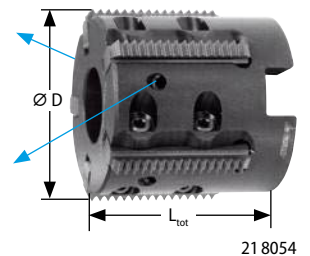
Application:

21 8050 – For general use on **right-hand and left-hand internal and external threads**. For threads in **through holes** and **blind holes**.

Note: Thread mill No. 218050 sizes 17/26 and 17/36 suitable for pitches up to and including 2.5 mm.
Thread mill No. 218050 sizes 30/65 suitable for pitches up to < 5.



Effective Ø D / Overhang L ₁	21R 21 8050 High performance indexable thread mill	Insert size	Number of cutting edges Z	L _{tot}	Ø D _s	Clamping screw	Fixing screw
mm	Weldon shank			mm	mm		
10/20	eShop	19	1	68	12	—	219859
11,7/25,5	eShop	19	1	73.5	12	—	219859
13,6/26	eShop	24	1	82	20	—	219926
15,1/30	eShop	24	1	85	20	—	219926
16/28	eShop	24	2	83	20	—	219926
17/26	eShop	25	2	85	25	—	219926
17/36	eShop	25	2	95	25	—	219926
19/44	eShop	25	2	104	25	—	219926
20,5/37	eShop	25	3	96	25	—	219926
22/43	eShop	25	3	102	25	—	219926
30/55	eShop	25	5	115	25	—	219926
24,5/43	eShop	41	2	104	25	219928	219927
30/65	eShop	41	3	128.5	32	219928	219927
36/65	eShop	41	4	128	32	219928	219927



Effective Ø D	21R 21 8054 High performance indexable thread milling head	Insert size	Number of cutting edges Z	L _{tot}	Mounting bore Ø H7	Fixing screw
mm	with bore			mm	mm	
36	eShop	25	5	33.5	16	219926

TOOL Scout

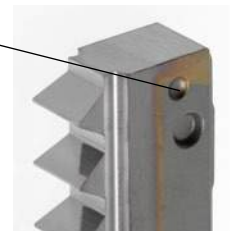
- Quick application-related tool selection
- Direct ordering in the eShop
- Tool selection not restricted to specific standards or manufacturers
- Cutting data - direct selection
- Tool information for reliable engineering

You can find optimum cutting data, machining strategy and NC programs for your machine programming in the ThreadScout.



Full
profile**Garant** Milling inserts for HPC indexable thread mills No. 218050 / 218054**Sturdy** milling inserts for **high feed rates** and **high productivity**.**Note:** Always fit the thread milling inserts with the marks matching, otherwise the thread will be distorted! (Sides have either a mark or no mark).Feed f_z = HB 7720 in steel < 750 N/mm² = 0.25 mm / tooth.Feed f_z = HB 7735 in INOX > 900 N/mm² = 0.15 mm / tooth.

Marking

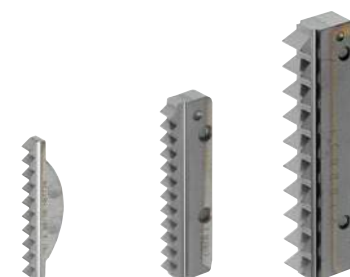


Suitable for/ v_c [m/min]	Alu plastics 	Alu cast 	Alu cast Si 								INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N					
HB 7720 -	140	120	80	120	110	100	80	60				80	70	40	70	120	120	●	○	●	●	○
HB 7735 -				120	110	100	80	60	25	20		80	70		70	120			○	●	●	○



21 8055–8058 – Single-edged

21 8060–8071 – Double-edged

Application:21 8055–8064 – **For metric internal threads 60°** to DIN / ISO R 262 (DIN 13) tolerance class 6H.21 8070/8071 – **For metric external threads 60°** to DIN / ISO R 262 (DIN 13) tolerance class 6g.

218055_2

218061_2

218063_4

Pitch	mm	0,5	0,75	1	1,25	1,5	1,75	2	2,5	3	3,5	4	4,5	5	5,5	6	Insert size mm
21D 21 8055	HB7720	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	–	–	–	–	–	–	2
21D 21 8056	HB7735	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	–	–	–	–	–	–	2
21D 21 8057	HB7720	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	–	–	–	–	–	–	2
21D 21 8058	HB7735	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	–	–	–	–	–	–	2
21D 21 8060	HB7720	–	–	eShop	–	eShop	–	eShop	eShop	eShop	–	–	–	–	–	–	2
21D 21 8061	HB7735	–	–	eShop	–	eShop	–	eShop	eShop	eShop	–	–	–	–	–	–	2
21D 21 8063	HB7720	–	–	–	–	–	–	–	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	2
21D 21 8064	HB7735	–	–	–	–	–	–	–	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	2
21D 21 8070	HB7720	–	–	eShop	–	eShop	–	eShop	eShop	eShop	–	–	–	–	–	–	2
21D 21 8071	HB7735	–	–	eShop	–	eShop	–	eShop	eShop	eShop	–	–	–	–	–	–	2



21 8077/8078 – Single-edged.

21 8080/8081 – Double-edged.

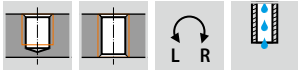
Application:**For internal and external threads 55°** to standard BS 84: 1956, DIN 259, ISO 228/1: 1982.

Tolerance class Medium Class A.



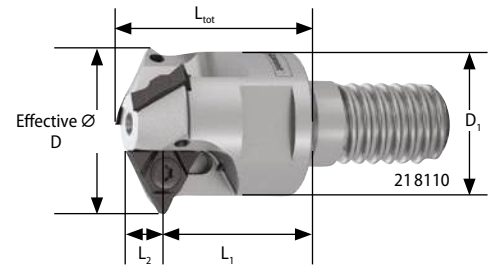
21 8080

Threads per inch	11	14	19	Insert size mm
21D 21 8077	HB7720	–	eShop	2
21D 21 8078	HB7735	–	eShop	2
21D 21 8080	HB7720	eShop	–	2
21D 21 8081	HB7735	eShop	–	2



Garant Indexable thread milling head for deep holes

- Application:**
- For large and deep threads.
 - For parallel internal threads; other inserts and carriers available on request.
 - For threads in through holes and blind holes.
 - For universal use on left-hand and right-hand threads.
 - Low cutting pressure.



Ø D	2TR 21 8110	Insert size	Number of cutting edges Z	Mounting thread	Effective Ø D	Ø D ₁	L _{tot}	L ₁	L ₂	Insert screw
mm	Thread milling head with threaded shank				mm	mm	mm	mm	mm	
15	eShop	11	1	M6	14.75	10.6	20.2	15	5.2	279810 4 (TX8; 1.02 Nm)
17	eShop	11	1	M8	16.75	13	22.2	17	5.2	279810 4 (TX8; 1.02 Nm)
21	eShop	11	2	M8	20.75	14.1	19.2	14	5.2	279810 4 (TX8; 1.02 Nm)
23	eShop	11	2	M10	23.3	18	19.2	14	5.2	279810 4 (TX8; 1.02 Nm)
26	eShop	11	3	M12	26.5	21	25.2	20	5.2	279810 4 (TX8; 1.02 Nm)
31	eShop	11	4	M12	30.9	25	28	22.8	5.2	279810 4 (TX8; 1.02 Nm)
36	eShop	16	3	M16	36.5	29	32.95	25	7.95	279810 2 (TX10; 1.58 Nm)
42	eShop	16	4	M16	42	32	32.95	25	7.95	279810 5 (TX10; 1.7 Nm)

Garant Milling head and insert overview



Select the right milling head and insert for the thread application area.

Milling head	D	Internal thread 21 8122 / 21 8124 Partial profile 60°				Internal and external thread 21 8131 / 21 8133 Partial profile 55°	
		ISO coarse thread	ISO fine thread	UNC	UN/UNF/UNEF/UNS	BSP(G)	BSW / BSF
21 8110_15	14,75	M24×3.0	M16×0.5; M16×0.75; M16×1.0; M17×1.25; M17×1.5	3/4–10	5/8–32UN; 5/8–28UN; 5/8–27UN; 11/16–24UN; 11/16–20UN; 11/16–16UN; 3/4–14UNS; 3/4–12UN	3/8–19; 1/2–14; 1–11	11/16–14; 3/4–12; 7/8–11; 3/4–10; 7/8–9; 1–8; 1 1/8–7
21 8110_17	16,75	M24×3.0	M18×0.5; M18×0.75; M18×1.0; M19×1.25; M19×1.5	–	3/4–32UN; 3/4–28UN; 7/8–27UN; 3/4–24UN; 3/4–20UN; 3/4–16UNF; 3/4–14UNS; 13/16–12UN; 7/8–10UN	1/2–14; 1–11	13/16–12; 7/8–11; 1–10; 7/8–9; 1–8; 1 1/8–7
21 8110_21	20,75	M30×3.5	M22×0.5; M22×0.75; M22×1.0; M23×1.5	1 1/8–7; 1 3/8–6	7/8–32UN; 7/8–28UN; 7/8–27UN; 7/8–24UNS; 7/8–20UNEF; 1–18UNS; 15/16–16UN; 1–14UNS; 1–10UNS	3/4–14; 1–11	1–26; 1–20; 1–16; 1–12; 1–10; 1 1/8–9; 1–8; 1 1/8–7
21 8110_23	23,3	M36×4.0	M24×0.5; M24×0.75; M25×1.0; M25×1.25; M26×1.5; M26×2.0		1–32UN; 1–28UN; 1–27UN; 1–24UNS; 1–20UNEF; 1–18UNS; 1–16UN; 1 1/8–10UNS	3/4–14; 1–11	1–26; 1–20; 1–16; 1 1/16–12; 1 1/8–9; 1 1/8–7
21 8110_26	26,5	M33×2.5; M36×4.0	M28×0.5; M28×0.75; M28×1.0; M28×1.25; M29×1.5		1 1/8–28UN; 1 1/8–24UNS; 1 1/8–18UNEF; 1 1/8–16UN; 1 1/4–14UNS; 1 3/16–12UN; 1 1/4–10UNS	7/8–14; 1–11	1 1/8–26; 1 1/8–20; 1 3/8–16; 1 3/8–12; 1 3/8–8; 1 1/4–7
21 8110_31	30,9		M32×0.5; M32×0.75; M33×1.0; M33×1.25; M33×1.5; M34×2.0		1 5/16–28UN; 1 3/8–24UNS; 1 5/16–20UN; 1 5/16–18UNEF; 1 5/16–16UN; 1 3/8–14UNS; 1 3/8–12UNF	11/8–11	1 3/8–26; 1 3/8–20; 1 3/8–16; 1 3/8–12; 1–10; 1 7/16–8
21 8110_36	36,5	M56×5.5; M64×6.0	M39×1.5; M39×2.0; M40×2.5	2 1/4–4	1 9/16–16UN; 1 5/8–14UNS; 1 9/16–12UN; 1 5/8–10UNS	11/4–11	1 5/8–16; 1 5/8–12; 1 5/8–8; 1 7/8–6; 1 3/4–5
21 8110_42	42,0	M56×5.5; M64×6.0	M45×1.5; M45×2.0; M46×2.5; M48×3.5	2 1/2–4	1 3/4–16UN; 1 3/4–14UNS; 1 13/16–12UN	11/2–11	1 7/8–16; 1 7/8–12; 1 7/8–8; 2 1/4–6; 2–4.5

Garant MODULAR THREAD MACHINING

The GARANT thread milling range

Ideal for making large and deep threads.

The standard connection thread allows the thread mill to be optimally adapted to the machining depth and the performance to be increased.

Standard connection thread

for adaptive extension

Short overall length

to prevent displacement

Stable insert seating



Partial
profile
△

Garant Thread milling inserts for thread milling heads with connection thread No. 218110

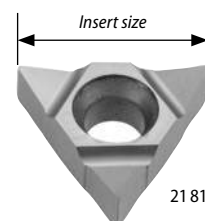
Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	≤ 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
21 8122–21 8133	140	120	80	120	110	100	80	60					80	70	40	70	120	●	●				



21 8122 – Insert size 11.

21 8124 – Insert size 16.

Application: For metric internal threads with 60° flank to DIN / ISO R 262 (DIN 13).



21 8122

Pitch	mm	0,5-1,5	1,5-2,0	2,5-3,5	2,5-4,0	4,0-6,0	Insert size		
							mm	< 1100 N f _z mm	INOX < 900 N f _z mm
2D 21 8122	Thread milling insert for internal threads 60°	HB7720	eShop	eShop	–	eShop	11	0.1	0.03
2D 21 8124		HB7720	–	eShop	eShop	–	16	0.1	0.03



21 8131 – Insert size 11.

21 8133 – Insert size 16.

Application: For internal and external threads with 55° flank to standard BS 84: 1956, DIN 259, ISO 228/1: 1982.



21 8131

Threads per inch		48-16	16-12	11-7	6-4	Insert size		
						mm	< 1100 N f _z mm	INOX < 900 N f _z mm
2D 21 8131	Thread milling insert	HB7720	eShop	eShop	–	11	0.05	0.03
2D 21 8133		HB7720	–	eShop	eShop	16	0.05	0.03



Dies

Closed, pre-slit form. $\geq M3$ with **tapered lead chamfer** on both sides for easy start to the threading action and clean swarf evacuation in the direction of cutting.

1 3/4 turns lead chamfer.

14 0350 – Tolerance zone 6e = **with undersize approx. 0.03 – 0.04 mm.**

For tolerance class “medium”, when studs are provided with a **galvanic protection coating**.

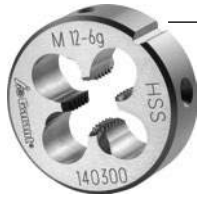
14 0300 Size M1–M1,4 – Tolerance zone 6h.

DIN 13
6h

$\leq M 1.4$

DIN 13
6g

$\leq M 1.6$



14 0300

Pre-slit:
If different thread
tolerances are required,
the die can be
split here.

DIN 13
6e



14 0350

DIN 13
6g



14 0330

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
14 0300–14 0350		O		●	●														●				○

M	14 0300	14 0350	14 0330	Pitch	External $\varnothing$	Height	M	14 0300	14 0350	14 0330	Pitch	External $\varnothing$	Height
	Garant		HOLEX					Garant		HOLEX			
	Die		Die					Die		Die			
	6g	6e	6g	mm	mm	mm		6g	6e	6g	mm	mm	mm
M1	eShop	–	–	0.25	16	5	M8	eShop	eShop	eShop	1.25	25	9
M1,2	eShop	–	–	0.25	16	5	M9	eShop	–	–	1.25	25	9
M1,4	–	–	–	0.3	16	5	M10	eShop	eShop	eShop	1.5	30	11
M1,6	–	–	–	0.35	16	5	M12	eShop	eShop	eShop	1.75	38	14
M1,7	–	–	–	0.35	16	5	M14	eShop	–	–	2	38	14
M2	–	–	–	0.4	16	5	M16	eShop	–	eShop	2	45	18
M3	–	eShop	eShop	0.5	20	5	M18	eShop	–	eShop	2.5	45	18
M3,5	eShop	–	–	0.6	20	5	M20	eShop	–	eShop	2.5	45	18
M4	eShop	eShop	eShop	0.7	20	5	M22	eShop	–	eShop	2.5	55	22
M5	eShop	eShop	eShop	0.8	20	7	M24	eShop	–	eShop	3	55	22
M6	eShop	eShop	eShop	1	20	7	M27	eShop	–	eShop	3	65	25
M7	eShop	–	–	1	25	9	M30	eShop	–	eShop	3.5	65	25



Dies for stainless and high-tensile steel

Closed, pre-slit form. $\geq M3$ with **tapered lead chamfer** on both sides for easy start to the threading action and clean swarf evacuation in the direction of cutting.

2 turns lead chamfer.

Lapped and nitrided, rake approx. 15°.

14 0400 Size M2,3; M2,6 – with old DIN profile.



14 0400



14 0460

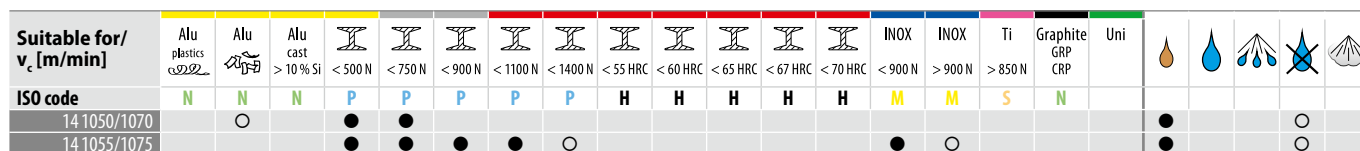
Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
14 0400/0460				●	●	●	●	●	●	●	●	●	●	●	●	●	●		●				○

M	14 0400	14 0460	Pitch	External $\varnothing$	Height	M	14 0400	14 0460	Pitch	External $\varnothing$	Height
	Garant	HOLEX					Garant	HOLEX			
	Die	Die					Die	Die			
			mm	mm	mm				mm	mm	mm
M2	eShop	–	0.4	16	5	M7	eShop	eShop	1	25	9
M2,2	eShop	–	0.45	16	5	M8	eShop	eShop	1.25	25	9
M2,3	eShop	–	0.4	16	5	M10	eShop	eShop	1.5	30	11
M2,5	eShop	–	0.45	16	5	M12	eShop	eShop	1.75	38	14
M2,6	eShop	–	0.45	16	5	M14	eShop	eShop	2	38	14
M3	eShop	eShop	0.5	20	5	M16	eShop	eShop	2	45	18
M3,5	eShop	eShop	0.6	20	5	M20	eShop	eShop	2.5	45	18
M4	eShop	eShop	0.7	20	5	M24	eShop	eShop	3	55	22
M5	eShop	eShop	0.8	20	7	M27	eShop	eShop	3	65	25
M6	eShop	eShop	1	20	7	M30	eShop	eShop	3.5	65	25



14 1050/1070 – **1¾ turns lead chamfer.**

14 1055/1075 – **2 turns lead chamfer. Lapped and nitrided**, rake approx. 15°. **For stainless and high-tensile steels.**



MF	11K	14 1050	11K	14 1055	12K	14 1070	12K	14 1075	External Ø	Height
	Garant				HOLEX					
	Die									
	HSS	HSS-E	HSS	HSS-E	mm	mm				
4×0,5	eShop	—	—	—	20	5				
5×0,5	eShop	—	—	—	20	5				
6×0,5	eShop	—	—	—	20	5				
6×0,75	eShop	eShop	—	eShop	20	7				
7×0,75	eShop	—	—	—	25	9				
8×0,5	eShop	—	—	—	25	9				
8×0,75	eShop	eShop	—	eShop	25	9				
8×1	eShop	eShop	eShop	eShop	25	9				
9×1	eShop	—	—	—	25	9				
10×0,75	eShop	—	—	—	30	11				
10×1	eShop	eShop	eShop	eShop	30	11				
10×1,25	eShop	eShop	—	eShop	30	11				
11×1	eShop	—	—	—	30	11				
12×1	eShop	eShop	eShop	eShop	38	10				
12×1,25	eShop	eShop	—	eShop	38	10				
12×1,5	eShop	eShop	eShop	eShop	38	10				
14×1	eShop	eShop	—	eShop	38	10				
14×1,25	eShop	—	—	—	38	10				
14×1,5	eShop	eShop	eShop	eShop	38	10				
15×1	eShop	—	—	—	38	10				
16×1	eShop	eShop	—	eShop	45	14				
16×1,5	eShop	eShop	eShop	eShop	45	14				
18×1	eShop	—	—	—	45	14				
18×1,5	eShop	eShop	eShop	eShop	45	14				
20×1	eShop	—	—	—	45	14				
20×1,5	eShop	eShop	eShop	eShop	45	14				
22×1	eShop	—	—	—	55	16				
22×1,5	eShop	—	eShop	—	55	16				
24×1	eShop	—	—	—	55	16				
24×1,5	eShop	—	eShop	—	55	16				
24×2	eShop	—	—	—	55	16				
25×1,5	eShop	—	—	—	55	16				
26×1,5	eShop	—	—	—	55	16				
27×1,5	eShop	—	—	—	65	18				
27×2	eShop	—	—	—	65	18				
28×1,5	eShop	—	—	—	65	18				
30×1	(eShop)	—	—	—	65	18				
30×1,5	eShop	—	—	—	65	18				
30×2	eShop	—	—	—	65	18				
32×1,5	eShop	—	—	—	65	18				

Die sets in a case

EN
22568DIN 13
6g14 2700/2725 – Die set **HSS**, 7 pieces (M3–M12) in a case.14 2710/2735 – Die set **HSS-E**, 7 pieces (M3–M12) in a case.

HSS

HSS
E

for metric threads		M3-12	Content:
11K 14 2700	Die set HSS	eShop	1 each die No. 140300 size M3; M4; M5; M6; M8; M10; M12.
11K 14 2710	Die set HSS-E	eShop	1 each die No. 140400 size M3; M4; M5; M6; M8; M10; M12.
12K 14 2725	Die set HSS	eShop	1 each die No. 140330 size M3; M4; M5; M6; M8; M10; M12.
12K 14 2735	Die set HSS-E	eShop	1 each die No. 140460 size M3; M4; M5; M6; M8; M10; M12.



Suitable for: Dies M3–M12

for metric threads		M3-12
11K 14 2740	Empty case for dies	eShop
12K 14 2745		eShop

Thread cutting set in a sheet metal case

14 5114–5314 – **Strong sheet metal case** with carrying handle and 2 offset catches. Each tool is securely stored and protected in a foam insert and is immediately ready to hand. The taps are raised up vertically when the lid is opened. For more detailed descriptions of the content see individual products.



14 5114_M3-12



14 5114_M3-20

for metric threads		M3-12	M3-20
11K 14 5114	Thread cutting set with tap sets, 3 pieces	eShop	eShop
12K 14 5119		eShop	eShop
11K 14 5314	Thread cutting set with spiral point taps	eShop	—
Content:			
1 each tap set, 3 pieces, No. 130150 (14 5114)		Size M3; M4; M5; M6; M8; M10; M12	Size M3; M4; M5; M6; M8; M10; M12; M14; M16; M18; M20
1 each tap set, 3 pieces, No. 130250 (14 5119)		Size M3; M4; M5; M6; M8; M10; M12	Size M3; M4; M5; M6; M8; M10; M12; M14; M16; M18; M20
3 each spiral point taps No. 131450 (14 5314)		Size M3; M4; M5; M6; M8; M10; M12	—
1 each die No. 140300 (14 5114, 14 5314)		Size M3; M4; M5; M6; M8; M10; M12	Size M3; M4; M5; M6; M8; M10; M12; M14; M16; M18; M20
1 each die No. 140330 (14 5119)		Size M3; M4; M5; M6; M8; M10; M12	Size M3; M4; M5; M6; M8; M10; M12; M14; M16; M18; M20
1 each jobber drill No. 114150 (14 5114, 14 5314)		Size 2.5; 3.3; 4.2; 5; 6.8; 8.5; 10.2	—
1 each adjustable tap wrench No. 148410		Size 1; 2	Size 1.1/2; 3
1 each jobber drill No. 114031 (14 5119)		Size 2.5; 3.3; 4.2; 5; 6.8; 8.5; 10.2	—
1 each die stock No. 149310		Size 20×5; 20×7; 25×9; 30×11; 38×14	Size 20×5; 20×7; 25×9; 30×11; 38×14; 45×18
1 toolholder with ratchet No. 148701		Size 85	Size 85; 110
1 thread gauge No. 477000			
1 screwdriver No. 664300			
		Size M/W	
		Size 3×60	
for metric threads		M3-12	M3-20
11K 14 5607	Sheet metal case empty for thread cutting set	eShop	eShop
12K 14 5612		eShop	eShop

Garant Fine thread cutting set – in a sheet metal case

14 5809 – **Sturdy sheet metal case** with carrying handle and 2 catches. Each tool is securely stored and protected in a foam insert and is immediately ready to hand. For more detailed descriptions of the content see individual products.



for metric fine threads	MF3-20
14 5809 Fine thread cutting set in a metal case	eShop
Content:	
1 set each hand tap No. 130470	Size 3×0.35; 4×0.5; 5×0.5; 6×0.75; 8×1; 10×1; 12×1.5; 14×1.5; 16×1.5; 18×1.5; 20×1.5;
1 each die No. 141050	Size 4×0.5; 5×0.5; 6×0.75; 8×1; 10×1; 12×1.5; 14×1.5; 16×1.5; 18×1.5; 20×1.5;
1 each adjustable tap wrench No. 148410	Size 1; 3
1 each die stock No. 149310	Size 20×5; 20×7; 25×9; 30×11; 38×10; 45×14
1 toolholder with ratchet No. 148701	Size 85; 110
1 thread gauge No. 477000	Size M/W
1 screwdriver No. 664300	Size 3×60
for metric fine threads	MF3-20
14 5817 Sheet metal case empty for fine thread cutting set	eShop



14 5809



Garant Pipe thread cutting set – in a case

Sturdy plastic case with carrying handle and 2 catches. Each tool is securely stored and protected in a foam insert and is immediately ready to hand. For more detailed descriptions of the content see individual products.

Application: For **Whitworth parallel pipe threads** DIN ISO 228/1

for parallel pipe threads	G1/8-1
14 5905 Pipe thread cutting set in a plastic case	eShop
Content:	
1 set each hand tap No. 130550	Size 5.5
1 each die No. 142050	Size 1/8; 1/4; 3/8; 1/2; 3/4; 1
1 each adjustable tap wrench No. 148410	Size 3; 5
1 each die stock No. 149310	Size 30×11; 38×10; 45×14; 55×16; 65×18
1 screwdriver No. 664122	Size 5.5



14 5905



Garant UNC thread cutting set in a case

Sturdy plastic case with carrying handle and 2 catches. Each tool is securely stored and protected in a foam insert and is immediately ready to hand. For more detailed descriptions of the content see individual products.

Application: For **UNC unified coarse threads** ASME–B1.1.

for UNC unified coarse threads	UNC1/4-3/4
14 5955 UNC thread cutting set in a plastic case	eShop
Content:	
1 set each hand tap No. 130700	Size 1/4; 5/16; 3/8; 7/16; 1/2; 5/8; 3/4
1 each die No. 142520	Size 1/4; 5/16; 3/8; 7/16; 1/2; 5/8; 3/4
1 each adjustable tap wrench No. 148410	Size 1.1/2; 2; 4
1 each die stock No. 149310	Size 20×7; 25×9; 30×11; 38×14; 45×18
1 screwdriver No. 664122	Size 5.5



14 5955



Garant UNF thread cutting set in a case

Sturdy plastic case with carrying handle and 2 catches. Each tool is securely stored and protected in a foam insert and is immediately ready to hand. For more detailed descriptions of the content see individual products.

Application: For **UNF unified fine threads** ASME–B1.1.

for UNF unified fine threads	UNF1/4-3/4
14 5965 UNF thread cutting set in a plastic case	eShop
Content:	
1 set each hand tap No. 130750	Size 1/4; 5/16; 3/8; 7/16; 1/2; 5/8; 3/4
1 each die No. 142620	Size 1/4; 5/16; 3/8; 7/16; 1/2; 5/8; 3/4
1 each adjustable tap wrench No. 148410	Size 1.1/2; 2; 4
1 each die stock No. 149310	Size 20×7; 25×9; 30×11; 38×10; 45×14
1 screwdriver No. 664122	Size 5.5



14 5965



Hand tap and spiral point tap sets in a case

When the case is opened, the tools raise up vertically and can easily be selected.

14 6260 – Consisting of spiral point taps M3; M4; M5; M6; M8; M10; M12, tapping drills size 2.5; 3.3; 4.2; 5; 6.8; 8.5; 10.2 and tap wrench size 1.1/2.

14 6350 – Consisting of spiral point taps M3; M4; M5; M6; M8; M10; M12, tapping drills size 2.5; 3.3; 4.2; 5; 6.8; 8.5; 10.2.

14 6050/6060 – Consisting of 3-piece hand tap sets M3; M4; M5; M6; M8; M10; M12.

14 6150/6175 – Consisting of 3-piece hand tap sets M3; M4; M5; M6; M8; M10; M12 and tapping drills size 2.5; 3.3; 4.2; 5; 6.8; 8.5; 10.2.

Hand tap sets, 3 pieces



for metric threads		M3-12	Content:
11K 14 6050	Garant	eShop	1 set each M3 – M12 hand taps 3 pieces No. 130150
12K 14 6060	HOLEX	eShop	1 set each M3 – M12 hand taps 3 pieces No. 130250

Hand tap sets, 3 pieces, with tapping drill



for metric threads		M3-12	Content:
11K 14 6150	Garant	eShop	1 pc. each 3-piece set of M3 – M12 hand taps No. 130150 and tapping drill No. 114150
12K 14 6175	HOLEX	eShop	1 pc. each 3-piece set of M3 – M12 hand taps No. 130250 and tapping drill No. 114031

Spiral point tap sets, short, with tapping drill



for metric threads		M3-12	Content:
11K 14 6260	Garant	eShop	1 pc. each spiral point tap M3 – M12 No. 131450, tapping drill No. 114150 and tap wrench No. 148410
11K 14 6350		eShop	1 pc. each spiral point tap M3 – M12 No. 134650 and tapping drill No. 114150

DIN
371DIN
376

Through hole machine tap sets in a case

When the case is opened, the tools raise up vertically and can easily be selected.

Through hole machine tap sets

Consisting of machine taps M3; M4; M5; M6; M8; M10; M12.



14 6435

14 6440

for metric threads		M3-12	Content:
^{11I} 14 6435	Garant	eShop	1 each machine tap M3 – M12 No. 132721
^{13V} 14 6437			1 each machine tap M3 – M12 No. 132642
^{12I} 14 6440	HOLEX	eShop	1 each machine tap M3 – M12 No. 132680
^{12K} 14 6445			1 each machine tap M3 – M12 No. 132645



Through hole machine tap sets, with tapping drill

Consisting of machine taps M3; M4; M5; M6; M8; M10; M12 and tapping drills size 2.5; 3.3; 4.2; 5; 6.8; 8.5; 10.2.



14 6650

14 6724

for metric threads		M3-12	Content:
^{11K} 14 6450	Garant	eShop	1 pc. each machine tap M3 – M10 No. 131150, 1 machine tap M12 No. 131200 and tapping drill No. 114150
^{11K} 14 6550		eShop	1 pc. each machine tap with oil groove M3 – M12 No. 131850 and tapping drill No. 114150
^{11K} 14 6650		eShop	1 pc. each machine tap M3 – M12 No. 132150 and tapping drill No. 114400
^{13V} 14 6721	HOLEX	eShop	1 pc. each machine tap M3 – M12 No. 132642 and tapping drill No. 114580
^{12H} 14 6724		eShop	1 pc. each machine tap M3 – M12 No. 131265 and tapping drill No. 114031.
^{12K} 14 6725		eShop	1 pc. each machine tap M3 – M12 No. 132645 and tapping drill No. 114405

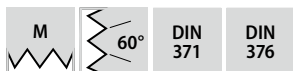


14

Blind hole machine tap sets in a case

When the case is opened, the tools raise up vertically and can easily be selected.

Blind hole machine tap sets

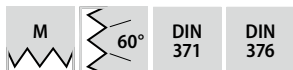


Consisting of machine taps M3; M4; M5; M6; M8; M10; M12.



for metric threads			M3-12	Content:	
11I	14 6735		GARANT Master Tap blind hole machine taps	eShop	1 pc. each machine tap M3 – M12 No. 135960
13V	14 6737		GARANT Vap Tap blind hole machine taps	eShop	1 pc. each machine tap M3 – M12 No. 135805
12I	14 6742		HOLEX Pro Tap blind hole machine taps	eShop	1 pc. each machine tap M3 – M12 No. 135910
12K	14 6745		Blind hole machine taps	eShop	1 pc. each machine tap M3 – M12 No. 135855

Blind hole machine tap sets, with tapping drill



Consisting of machine taps M3; M4; M5; M6; M8; M10; M12 and tapping drills size 2.5; 3.3; 4.2; 5; 6.8; 8.5; 10.2.



for metric threads			M3-12	Content:	
11K	14 6950		Blind hole machine taps + tapping drills	eShop 	1 pc. each machine tap M3 – M12 No. 135450 and tapping drill No. 114400
13V	14 6955		Blind hole machine taps + tapping drills	eShop	1 pc. each machine tap M3 – M12 No. 135450 and tapping drill No. 114400
12H	14 6924		HOLEX Clever Tap blind hole machine taps + tapping drills	eShop	1 pc. each machine tap M3 – M12 No. 135255 and tapping drill No. 114031
12K	14 6925		Blind hole machine taps + tapping drills	eShop 	1 pc. each machine tap M3 – M12 No. 135855 and tapping drill No. 114405

Empty cases



Type	1	2	3	4	5
11K 14 6960	Garant				
12K 14 6961	HOLEX				
Empty case					
for taps M3–M12	Sets, 3 pieces DIN 352	Sets, 3 pieces DIN 352	Spiral point DIN 352	Machine taps DIN 371/376	Machine taps DIN 371/376
for 1 each tapping drill	–	Size M3–M12	Size M3–M12	Size M3–M12	–
for 1 adjustable tap wrench No. 148410	–	–	No. 1.1/2	–	–

Garant Toolholder with ratchet

With two-jaw chuck for clamping square shanks.

Moveable T-handle with a groove centred and at each end for engaging the retaining ball.

Holder with stainless steel sheath.

Ratchet is reversible and can also be locked. **All-steel construction** for high torque applications. Clamping jaws milled and hardened for high toughness and optimum surface hardness.

14 8701 Size 117 – **Heavy-duty version** for taps up to M20.

With head-side hexagon with 22 mm jaw width.

14 8706 – **Adaptor** with 1/4 inch hexagon shank to DIN 3126, in all-steel version, for holding small taps (M3 – M10).

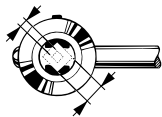
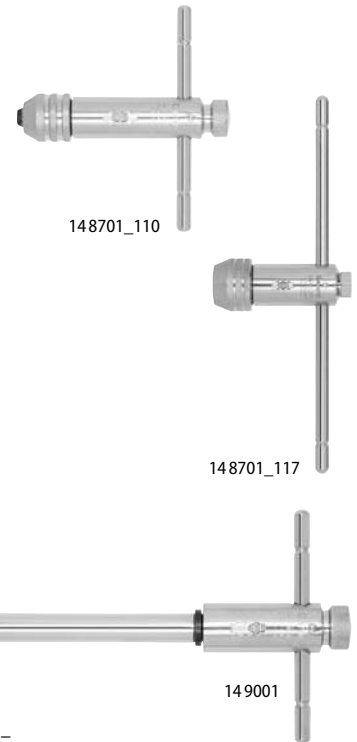
Application:

14 8701 – Suitable for tapping holes where access is difficult.

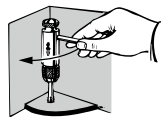
14 8706 – Ideal for repair and assembly work in mobile situations.

14 9001 – Suitable for tapping holes where access is difficult.

Note: The square sizes of other tap and reamer sizes can be found in the tables in the respective Product Groups.



With 2 adjustable jaws.
The specified dimensions relate to the smallest and largest diameter.



With ratchet and adjustable T-handle – particularly useful for tapping holes where access is difficult.

Overall length	mm	85	110	117	250	300
14 8701 Toolholder with ratchet	All-steel	eShop	eShop	eShop	–	–
14 9001 Toolholder with ratchet long	All-steel	–	–	–	eShop	eShop
Capacity □	mm	2.5 – 5.5	4.5 – 8	8.5 – 12.5	2.5 – 5.5	4.5 – 8
for hand taps DIN 352		M3 – M10	M5 – M12	M13 – M20	M3 – M10	M5 – M12
Spare jaws No. 148712 size		85	110	117	85	110

Type		6,3C	6,3E
14 8706 Adapter for toolholder	All-steel	eShop	eShop
Capacity □	mm	2.5 – 5.5	
for hand taps DIN 352		M3 – M10	
Shank standard		DIN 3126 Form C	DIN 3126 Form E



14

HOLEX Pin vice

Serrated brass handle, nickel-plated with two interchangeable collets for different diameters.

With square clamping nut.

14 9150 Pin vice		eShop
Capacity □	mm	0 – 3
Overall length	mm	110

Serrated brass handle, nickel-plated.

Size 0-3 – With two collets for different diameters.

Size 0-1; 1-2 – With one collet.

Capacity □	mm	0-1	1-2	0-3
14 9160 Pin vice		eShop	eShop	eShop
Capacity □	mm	0 – 1	1 – 2	0 – 3
Overall length	mm	74	74	105



149150



149160_0-1/1-2



149160_0-3

Garant Adjustable micro tap wrench with round vial

Precision tap wrenches for exact axial guidance even with the smallest thread dimensions.

- Precisely eroded steel clamping jaws hardened.
- Lightweight design made of 3D printing plastic.
- Pre-centering of the tap using an integral retaining magnet.
- Easy clamping of taps by means of a bayonet lock.

Application: For exact perpendicular guidance, especially on small taps M1 – M3. Can also be used for direct mounting in a die stock No. 149310 25×9.

Note: Removable round vial with magnetic fixing.



14 8450



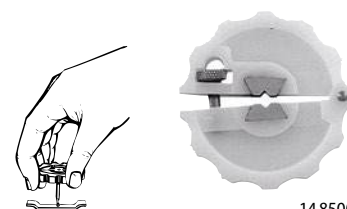
Type	M1-M3	External Ø mm	Capacity square up to mm
14 8450 Micro tap wrench with vial	eShop	25	1.6 – 2.7

HOLEX Adjustable circular tap wrench

Adjustable to tool square drive by means of a knurled adjusting screw. Hardened clamping jaws.

Application: For gentle cutting with small taps M1 – M2.6.

Type		External Ø mm	Capacity square up to mm
14 8500 Circular tap wrench	eShop	40	2.4



14 8500

Adjustable tap wrenches

With hardened jaws and steel grips. For use in confined spaces one steel handle can be unscrewed.

14 8200 – For **heavy** duties and **precision applications**. All dimensions with **high-quality forged steel base bodies** and integral fixed jaws. **Round vials** for straight application.

14 8350 – Strengthened version. All dimensions with high-quality steel housing and all-steel handles, optimised clamping mechanism.

14 8410 – For **standard** use: Zinc die-cast body.



14 8200

14 8350

14 8410

Type	14 8200	14 8350	14 8410	Capacity □	for hand taps DIN 352	for hand reamer Ø DIN 206	Overall length
	Garant		HOLEX				
	Tap wrench, adjustable						
	strengthened	strengthened		mm		mm	mm
0	eShop	eShop	eShop	2 – 5	M1 – M8	2.5 – 6.5	125
1	eShop	eShop	eShop	2 – 6.3	M1 – M10	2.5 – 7.5	175
1.1/2	eShop	eShop	eShop	2 – 8	M1 – M12	2.5 – 9.5	175
2	eShop	eShop	eShop	3 – 9	M4 – M12	5 – 10	265
3	eShop	eShop	eShop	4.9 – 12	M5 – M20	6.5 – 15	370
4	eShop	eShop	eShop	5.5 – 16	M9 – M27	7 – 20	480
5	eShop	eShop	eShop	7 – 20	M12 – M33	9 – 26	700
6	eShop	eShop	–	9 – 24	M16 – M42	11 – 32	1000
7	eShop	eShop	–	14.5 – 36	M25 – M58	20 – 45	1258
8	–	eShop	–	14.5 – 40	M25 – M68	20 – 50	1258

HOLEX Die stock

Steel handle can be unscrewed. With 5 screws to clamp the die. **Up to size 65×25** of die-cast zinc, **from size 75×20** of steel.

Application: For direct mounting of solid and adjustable dies to EN 22568.



14 9310

for die Ø × height	14 9310	Overall length	Number of fastening screws	for die Ø × height	14 9310	Overall length	Number of fastening screws
mm	Die stock	mm		mm	Die stock	mm	
16×5	eShop	160	4	50,8×15,9	eShop	560	3
20×5	eShop	175	4	55×16	eShop	495	5
20×7	eShop	175	4	55×22	eShop	495	5
25×9	eShop	210	5	65×18	eShop	630	5
25,4×9,5	eShop	225	3	65×25	eShop	630	5
30×11	eShop	260	5	75×20	eShop	700	5
38×10	eShop	310	5	75×30	eShop	700	5
38×14	eShop	310	5	90×22	eShop	900	5
38,1×12,7	eShop	315	3	90×36	eShop	900	5
45×14	eShop	440	5	105×22	eShop	930	5
45×18	eShop	440	5				

HOLEX Extensions for taps and hand reamers
DIN
377

Hardened and nickel-plated. Square drive and square socket the same size.

Application: For extending short taps (e.g. DIN 351 / 352 / 2181 / 5157), hand reamers and other tools with square shanks.

Note: Extensions for machine taps with shank, e.g. to DIN 371 / 374 / 376, can be found under **No. 338400**.



14 9400

Internal and external □	12L 14 9400	for metric taps DIN 352	Ø D	Overall length	Internal and external □	12L 14 9400	for metric taps DIN 352	Ø D	Overall length
mm	Extension		mm	mm	mm	Extension		mm	mm
2,1	eShop	M1 – M2.6	6	60	8	eShop	–	17	125
2,4	eShop	–	6	70	9	eShop	M13 – M16	19	130
2,7	eShop	M3	7	80	10	eShop	–	21	140
3	eShop	M3.5	7	90	11	eShop	M18	23	150
3,4	eShop	M4	8	95	12	eShop	M20	25	155
3,8	eShop	–	9	100	13	eShop	–	27	165
4,3	eShop	–	10	105	14,5	eShop	M22 – M24	29	175
4,9	eShop	M4.5 – M8	11	110	16	eShop	M27	30	180
5,5	eShop	M9 – M10	12	115	18	eShop	M30	33	200
6,2	eShop	M11	14	120	20	eShop	M33	36	220
7	eShop	M12	15	125					

Set of holders for cutting internal and external threads on conventional lathes

High-quality **holders** for taps and dies for use on conventional lathes.

Size 2Q – Set of holders with quick-change system for internal threads **M3 – M16** and external threads **M3 – M14**.

Size 3Q – Set of holders with quick-change system for internal threads **M4 – M24** and external threads **M16 – M24**.

Supplied with: Complete set of holders with bits and sockets, in a synthetic leather case.

Without cutting tools.

Note: A reducing adapter (see No. 343000) can be used to easily change the existing **MT3** face mill arbor on the machine to accept MT4 or larger. Further holder sets, reducer pieces and individual holders available on request.



14 9650

Type	2Q	3Q
14B 14 9650 Set of holders	eShop	eShop
Shank for dies	MT3	
for taps	M3 – M14 M3 – M16	M16 – M24 M4 – M24

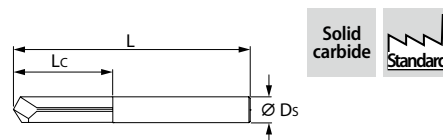
Garant Solid carbide tap drilling out tool

Strong plain shank with **hexagon** for mounting in a drill chuck and self-centring cutting edge.

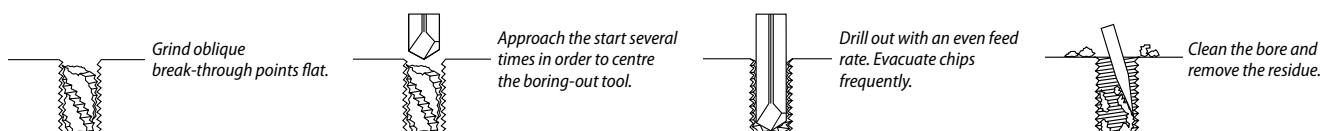
Application: For **drilling out broken off taps**.

Stable clamping is necessary, the hole must be dry and without cutting oil.

Note: v_c for material < 67 HRC 10 – 28 m/min.
Wear safety glasses.

Solid carbide
Standard

14 9830



for taps	12L 14 9830	L _c	L	Ø D _s
	Solid carbide tap drilling out tool plain shank with hexagon			
	TiAIN	mm	mm	mm
M3	eShop	10	38	3
M4	eShop	14	46	4
M5	eShop	19	50	5
M6	eShop	23	50	6
M8	eShop	23	60	7
M10	eShop	25	100	9
M12	eShop	35	100	11

Tap extractor set

Number of drilling-out tools

5

14 9831

Solid carbide tap drilling-out tool set in a case

TiAIN

eShop

Content:

1 each solid carbide tap drilling-out tool No. 14 9830

Sizes M3; M4; M5; M6; M8



14 9831

369

14



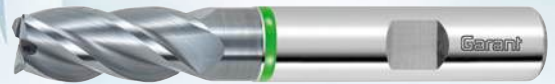
New products – Machining – milling

NEW

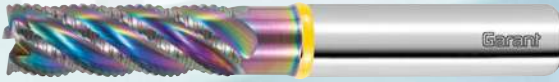
We use this symbol to tag new items
in our range of catalogue products



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GARANT **INOX** milling cutter with chip separators HPC/TPC



Page **472**
GARANT **Steel** solid carbide milling cutter with chip separators HPC



Page **495**
GARANT **Master ALU SlotMachine** solid carbide roughing end mill HPC/TPC



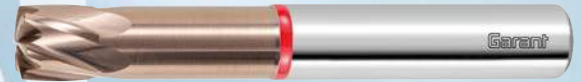
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GARANT **INOX SlotMachine** solid carbide roughing end mill HPC



Pages **490/528/536**
GARANT **Diabolo** solid carbide milling cutter HRC62
GARANT **Diabolo** solid carbide torus cutter HRC62
GARANT **Diabolo** solid carbide ball nose slot drill HRC62



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GARANT **GreenPlus** solid carbide milling cutter HPC



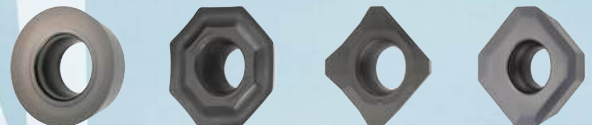
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GARANT solid carbide high feed rate milling cutter HSC



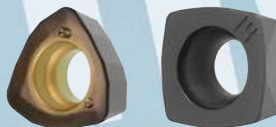
Page **641 – 643**
GARANT **Softcut**® 90° high-performance mill for inserts **AO.1104**
Chamfer mill/shoulder mill with Weldon shank, plain shank, with bore/porcupine mill



Pages **599, 631**
HOLEX inserts RD..1003, RD..12T3, SO..09T3



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GARANT inserts RD..05-..12, OF..05, SE..12, SD..09
with **diamond coating**



Pages **608/614 – 615**
GARANT **tool material update**
GARANT **Power Q**
and GARANT **Feeding**



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Haimer **DUO-LOCK** solid carbide extension

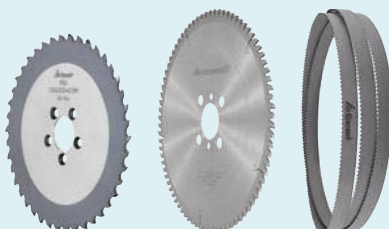


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Kennametal **tool material update** for steel machining

Machining – Milling



The whole catalogue of these brands
is available from the Hoffmann Group – just request it!



Garant



BAHCO



WITTMANN - KOMET

Re-Bo

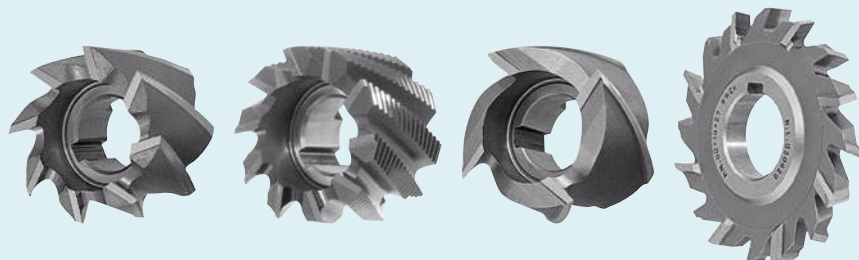


HOLEX

Metal band saw blades
and metal
circular saw blades,
saw system

17

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390

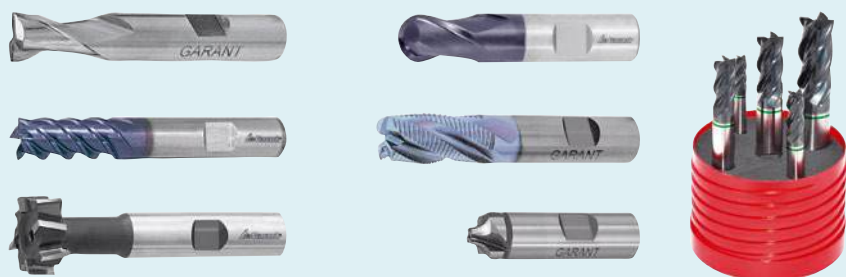


HPC
Milling cutters with
bore
HSS and solid carbide

Garant

18

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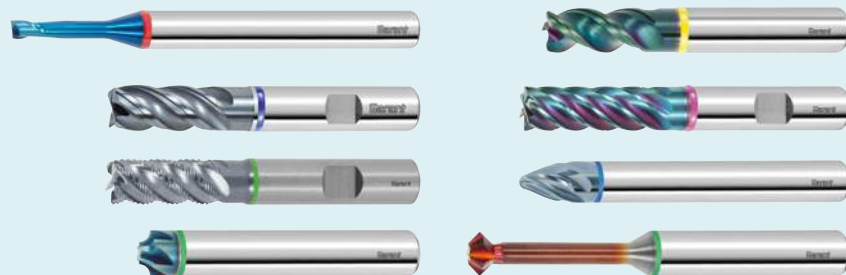
HPC / MTC
HSS milling
cutters, sets, Woodruff
keyseating cutters,
T-slot cutters, dovetail
milling cutters, ball
nose slot drills, corner
rounding cutters

Garant

HOLEX

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Colour code
DIN-ISO 513
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Solid carbide milling
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Garant

HOLEX

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Range overview
Modular milling
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**Tool materials over-
view** pages 584 – 586
Face milling, shoulder
milling, copy milling,
chamfering, engraving,
radius milling cutter,
circular milling,
parting-off milling

Garant



HOLEX

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Solid carbide milling
interchangeable head
system, modular
face milling, corner
milling, copy milling,
side milling

HAIMER



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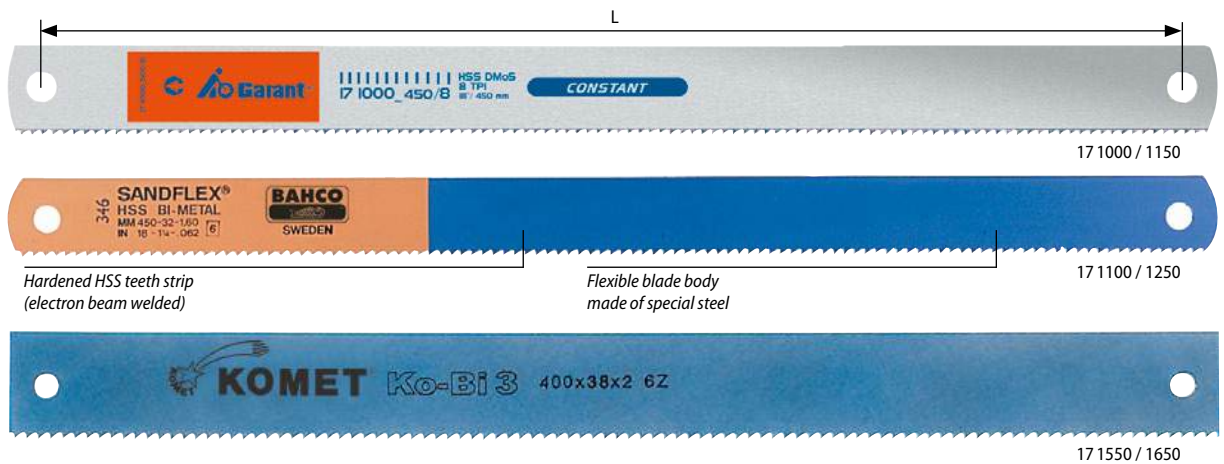


Power saw blades for power hacksaws

- 17 1000/1150 – **GARANT** – saw blade made of molybdenum alloyed high performance cutting steel **HSS (DMo5)**. Due to constantly high hardness and extreme toughness, particularly **high cutting performances** are obtained (reduced cutting times and longer tool life). The precise set ensures a straight cut.
- 17 1100/1250 – **BAHCO bi-metal** – a strip of HSS teeth welded to a flexible blade body of special steel using electron beam welding in a vacuum. In this way the saw blades are extremely hard at the tooth tips, but have **enormous flexibility** and are unbreakable even **at high feed rates**.
- 17 1550/1650 – **KOMET bi-metal** – tooth tips of HSS-M3 and blade body of spring steel. For high cutting performance and feed rates. Unbreakable for maximum safety at the workplace.

Note:

- 17 1150–1650 – **Especially for Kasto machines** (clamping holes offset from 38 mm blade width).
Important: The instructions included with the saw blades must be followed in all details.
- 17 1550/1650 – **KOMET HSS saw blades:** Other versions such as VP 7 (7° rake angle, Vario toothing) and P 13 (13° rake angle – especially for stainless steels) available on request on short delivery times.



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
17 1000/1150		○	○	●	●	○										○		●		●			
17 1100/ 1250–17 1650		○	○	●	●	●	●	○									○	●	●	●	●		

Length L / TPI	11R	16D	16E		Width			Thickness			Clamping hole Ø
	17 1000	17 1100	17 1550								
											
	Power saw blade										
	HSS	bimetal	Ko-Bi3		17 1000 mm	17 1100 mm	17 1550 mm	17 1000 mm	17 1100 mm	17 1550 mm	mm
300/6	eShop	—	—	10	25	—	—	1.6	—	—	8.5
300/8	eShop	—	—	10	25	—	—	1.6	—	—	8.5
300/10	eShop	—	eShop	10	25	—	25	1.6	—	1.25	8.5
300/14	eShop	eShop	eShop	10	25	25	25	1.6	1.25	1.25	8.5
350/6	eShop	eShop	eShop	10	32	32	32	1.6	1.6	1.6	8.5
350/8	eShop	—	—	10	32	—	—	1.6	—	—	8.5
350/10	eShop	eShop	eShop	10	32	25	32	1.6	1.25	1.6	8.5
350/14	eShop	eShop	—	10	32	25	—	1.6	1.25	—	8.5
400/4	eShop	eShop	eShop	10	32	32	32	2	1.6	1.6	8.5
400/6	eShop	eShop	eShop	10	32	32	32	2	1.6	1.6	8.5
400/8	eShop	eShop	eShop	10	32	32	32	1.6	1.6	1.6	8.5
400/10	eShop	eShop	eShop	10	32	32	32	1.6	1.6	1.6	8.5
400/14	eShop	eShop	eShop	10	32	32	32	1.6	1.6	1.6	8.5
425/6	eShop	—	—	10	32	—	—	2	—	—	8.5
450/4	eShop	eShop	eShop	10	32	38	38	2	2	2	10.5
450/6	eShop	eShop	eShop	10	32	32	38	2	1.6	2	10.5
450/8	eShop	eShop	eShop	10	32	38	38	2	2	2	10.5
450/10	eShop	eShop	eShop	10	32	32	38	2	1.6	2	10.5
500/4	eShop	—	—	10	38	—	—	2	—	—	10.5
500/6	eShop	eShop	eShop	10	38	38	38	2	2	2	10.5
500/8	eShop	—	—	10	38	—	—	2	—	—	10.5
500/10	eShop	—	—	10	38	—	—	2	—	—	10.5
550/4	eShop	—	—	10	45	—	—	2.25	—	—	10.5
550/6	—	eShop	—	10	—	45	—	—	2.25	—	10.5
550/8	eShop	—	—	10	45	—	—	2.25	—	—	10.5
575/4	—	eShop	—	10	—	45	—	—	2.25	—	12.5
600/4	eShop	eShop	—	10	50	50	—	2.5	2.5	—	12.5
600/6	eShop	—	—	10	50	—	—	2.5	—	—	12.5
600/8	eShop	—	—	10	50	—	—	2.5	—	—	12.5

Length L / TPI	11R	16D	16E		Width		Thickness		Clamping hole Ø
	17 1150	17 1250	17 1650						
									
	Power saw blade								
	for Kasto				17 1150 17 1650	17 1250	17 1150 17 1650	17 1250	
	HSS	bimetal	Ko-Bi3		mm	mm	mm	mm	mm
300/6	eShop	—	—	10	32	—	2	—	8.5
300/8	eShop	—	—	10	32	—	2	—	8.5
300/10	eShop	—	—	10	32	—	2	—	8.5
350/4	eShop	—	—	10	32	—	2	—	8.5
350/6	eShop	—	—	10	32	—	2	—	8.5
350/8	eShop	—	—	10	32	—	2	—	8.5
350/10	eShop	—	—	10	32	—	2	—	8.5
400/8	eShop	—	—	10	32	—	2	—	8.5
400/10	eShop	—	—	10	32	—	2	—	8.5
450/4	eShop	eShop	eShop	10	38	38	2	2	8.5
450/6	eShop	eShop	eShop	10	38	38	2	2	8.5
450/8	eShop	—	—	10	38	—	2	—	8.5
450/10	—	eShop	eShop	10	38	38	2	2	8.5
500/4	eShop	—	—	10	50	—	2.5	—	10.5
500/6	eShop	—	—	10	50	—	2.5	—	10.5
500/8	eShop	—	—	10	50	—	2.5	—	10.5
550/4	eShop	eShop	—	10	45	50	2.25	2.5	10.5
550/6	eShop	—	—	10	45	—	2.25	—	10.5
550/8	eShop	—	—	10	45	—	2.25	—	10.5
550/10	eShop	—	—	10	45	—	2.25	—	10.5
575/3	eShop	—	—	10	50	—	2.5	—	10.5
575/4	eShop	eShop	eShop	10	50	50	2.5	2.5	10.5
575/6	eShop	eShop	—	10	50	50	2.5	2.5	10.5
575/8	eShop	—	—	10	50	—	2.5	—	10.5
650/4	eShop	eShop	—	10	50	50	2.5	2.5	10.5
650/6	—	eShop	eShop	10	50	50	2.5	2.5	10.5
650/8	eShop	—	—	10	50	—	2.5	—	10.5
700/4	eShop	eShop	eShop	10	50	50	2.5	2.5	10.5
700/6	eShop	eShop	—	10	50	50	2.5	2.5	10.5



Band saw blades in coils

Regular tooth pitch – Constant pitch with 0° rake angle in plastic dispenser, no welded joint.

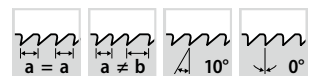
17 2000 – **RRR-Plus** made of alloyed tool steel, 30 m each coil.

17 2050/2100 – **bi-alpha-cobalt: High-performance bi-metal band saw blade** with high chrome content **spring steel backing** and cobalt alloyed (M42) HSS tooth tips (67–69HRC). **Extreme tooth tip hardness, flexible backing**, each roll 15 m.

Application: Particularly suitable for smaller and medium size cross sections (up to maximum 70 mm contact length).

Note:

- **Regular pitch teeth 10°:** Sizes 6/4H, 6/6H, 10/4H, 10/6H, 13/4H, 13/6H, 16/4H.
- **Variable pitch teeth 0°:** Size 6/1014, 10/1014, 13/1014.

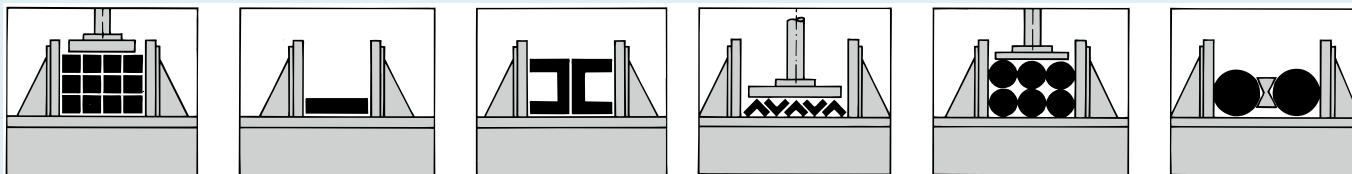


Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
17 2000				85	65	55	35	20					30	20	20	40						
17 2050/2100		100	60	85	65	55	35	20					30	20	20	40	60					

width mm / TPI	16F 17 2000	16F 17 2050	16F 17 2100	Thickness			width mm / TPI	16F 17 2000	16F 17 2050	16F 17 2100	Thickness		
	Band saw blade			17 2000	17 2050	17 2100		Band saw blade			17 2000	17 2050	17 2100
	RRR Plus 30 m	bi-alfa-cobalt 15 m	bi-alfa-cobalt 15 m	mm	mm	mm		RRR Plus 30 m	bi-alfa-cobalt 15 m	bi-alfa-cobalt 15 m	mm	mm	mm
6/4H	eShop	—	—	0.65	—	—	10/8	eShop	—	eShop	0.65	—	0.9
6/6H	eShop	—	eShop	0.65	—	0.9	10/10	eShop	—	eShop	0.65	—	0.9
6/8	eShop	—	—	0.65	—	—	10/14	eShop	—	eShop	0.65	—	0.9
6/10	eShop	—	eShop	0.65	—	0.9	10/1014	—	eShop	eShop	—	0.6	0.9
6/14	eShop	—	eShop	0.65	—	0.9	10/18	eShop	—	—	0.65	—	—
6/1014	—	eShop	eShop	—	0.6	0.9	10/24	eShop	—	—	0.65	—	—
6/18	eShop	—	—	0.65	—	—	13/4H	eShop	—	(eShop)	0.65	—	0.9
6/24	eShop	—	—	0.65	—	—	13/6H	eShop	eShop	eShop	0.65	0.6	0.9
8/8	eShop	—	—	0.65	—	—	13/8	eShop	—	—	0.65	—	—
8/10	eShop	—	—	0.65	—	—	13/10	—	—	eShop	—	—	0.9
8/14	eShop	—	—	0.65	—	—	13/14	eShop	—	—	0.65	—	—
8/18	eShop	—	—	0.65	—	—	13/1014	—	eShop	—	—	0.6	—
8/24	eShop	—	—	0.65	—	—	16/4H	eShop	—	—	0.8	—	—
10/4H	eShop	—	—	0.65	—	—	16/8	eShop	—	—	0.8	—	—
10/6H	eShop	eShop	eShop	0.65	0.6	0.9							

Clamping of the material

Clamp the material so that the band saw blade cuts with as little vibration as possible. When cutting material bundles, tack weld the ends together if necessary. This increases the cutting performance and the blade life.



Running in new blades

At normal feed rates the sharp teeth of a new blade dig very aggressively into the material. Therefore reduce the feed rate by 50 % and the cutting speed by 70 % for the first cuts. After the blade has cut an area of about 400 cm², slowly increase the feed rate to the optimum value. **The working life of a band-saw blade is to a large extent dependant on controlled running in!**

Coolant

The coolant helps to prevent the saw tooth and workpiece from overheating and to take the chips away from the cutting point. Coolant is normally applied when sawing all steels. Cast iron on the other hand is usually sawn dry. Cutting oil gives good results when sawing case-hardening steels, higher alloyed tool steels, heat-treatable steels, stainless steels and titanium. Micro-spray systems give good results when sawing pipes and profiles. In this connection, note the need for a good chip clearance brush.

Cutting speed and feed rate

The cutting speed (blade speed) depends on the tensile strength, type and cross-section of the material to be sawn. The greater the tensile strength, the lower the cutting speed should be. Smaller cross-sections can be sawn at higher speeds than larger cross-sections. Thin-walled pipes and profiles, and sharp edges, are sawn at low feed rates; the feed rate (pressure) should be kept as constant as possible.

Material	Cutting speed in m/min bi-alfa-cobalt (M42)
General purpose steels / machining steels	80 – 90
Case-hardening steels / heat-treatable steels	45 – 75
Unalloyed tool steels / roller bearing steels	40 – 60
Alloyed tool steels / high speed steels	30 – 40
Stainless steels	20 – 35
Heat resistant steels High-temperature alloys	15 – 25

If vibration occurs adjust the cutting speed (m/min) to marginally faster or slower.

As the blade becomes more blunt increase the feed rate somewhat.

Assessing a cracked weld on the blade

Straight rupturing of the weld after a short period of use indicates a manufacturing fault. Breaking of the weld after longer term use, the crack propagating as a zigzag, is an overload fracture.

Tooth pitches

Tooth pitch recommendations for **solid material**:
Recommendation: also state the rake angle.

Tooth pitch recommendations for **pipes**:

For material thickness	Variable pitch teeth	Rake angle
< 25 mm	10/14	0°
15 – 40 mm	8/12	0°
25 – 50 mm	6/10	0°
35 – 70 mm	5/8	0°
40 – 90 mm	5/6	10°
50 – 120 mm	4/6	0° / 10°
50 – 150 mm	4/5	10°
80 – 180 mm	3/4	0° / 10°
130 – 350 mm	2/3	10°
150 – 400 mm	1.5/2	10°
200 – 600 mm	1.1/1.6	10°
> 500 mm	0.75/1.25	10°

Variable pitch teeth 3/4 0° and 4/6 0° are suitable only for pipes, profiles and girders, **not** for solid material. Variable pitch teeth 10° and the band qualities Bi-Alfa Master No. 174050 are recommended for sawing solid material of high-alloy and long-chipping materials.

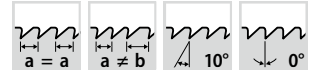
Wall thickness S (mm)	Pipe outside Ø D (mm) Tooth pitch Z (tpi)									
	20	40	60	80	100	120	150	200	300	500
2	14	10/14	10/14	10/14	10/14	8/12	8/12	8/12	8/12	5/8
3	14	10/14	10/14	8/12	8/12	8/12	8/12	6/10	6/10	5/8
4	10/14	10/14	8/12	8/12	8/12	6/10	6/10	5/8	5/8	4/6
5	10/14	10/14	8/12	8/12	6/10	6/10	5/8	4/6	4/6	4/6
6	10/14	8/12	8/12	6/10	6/10	5/8	5/8	4/6	4/6	4/6
8	10/14	8/12	8/12	6/10	5/8	5/8	4/6	4/6	4/6	4/6
10		8/12	6/10	5/8	4/6	4/6	4/6	4/6	4/6	4/5
12		8/12	6/10	4/6	4/6	4/6	4/6	4/6	4/6	4/5
15		8/12	6/10	4/6	4/6	4/6	4/5	4/5	4/5	4/5
20			4/6	4/6	4/6	4/6	4/5	4/5	4/5	3/4
30				4/6	4/6	4/5	4/5	4/5	4/5	2/3
50							4/5	3/4	2/3	2/3
80								3/4	2/3	2/3
> 100									2/3	1.5/2

For thin-walled pipes (up to approx. 8 mm wall thickness) use preferably tooth pitches with 0° rake. **Rule of thumb: There should be at least 3 teeth in contact with the component.**

Blade width

The largest blade width permissible on the machine should be selected, in order to achieve sufficient stability at higher feed rate forces. When sawing curves, the blade width depends on the smallest radius to be cut (see table).

Radius (mm)	3	8	15	30	38	65	100	140
Blade width (mm)	3	5	6	8	10	13	16	20

HSS
Co8

Metal band saw blades welded in standard lengths

GARANT – high-performance bi-metal band saw blade with wear-resistant **M42 teeth** and special flexible backing with increased load capacity.

X-RAY – bi-alfa-cobalt: High-performance bi-metal band saw blade with **M42** high-speed alloy steel (HSS, 67-69 HRC) tooth tips and a high-alloy spring steel backing.

HOLEX – Production band saw blade with high cutting performance.

Application: **Variable pitch teeth 0°** – very low vibration, for a large range of cross sections (for pipes and profiles, solid materials up to maximum 70 mm).

Variable pitch teeth 10° – general purpose for a wide range of cross-sections (for solid material from 50 mm).

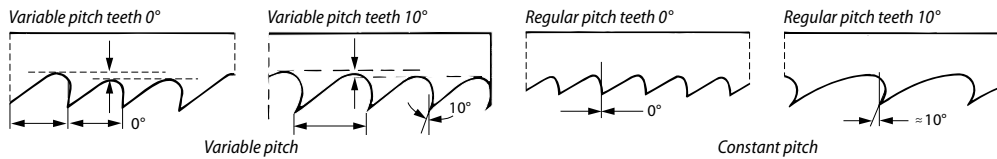
Regular pitch teeth 0° – for small to medium cross-sections up to maximum 70 mm engagement length.

Regular pitch teeth 10° – for large cross-sections from 50 mm engagement.

Note: **Running in a new blade:** See GARANT machining handbook No. 110010 and information page.



GARANT
RÖNTGEN
HOLEX



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
Combi 0°/ normal 0°		100		85	65	55	35	20								40		○	●	●	○		
Combi 10°/ normal 10°		100		85	65	55	35	20					30	20	20	40	60	●	●	●	○		

TPI	11S	17 3480 Garant	16F	17 3500 RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 13×1138					degrees	mm	mm	mm
6/10		–		eShop	5	combi	0	13	0.6	1138
8/12		eShop		eShop	5	combi	0	13	0.6	1138
10/14		–		eShop	5	combi	0	13	0.6	1138

TPI	11S	17 3530 Garant	16F	17 3550 RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 13×1325					degrees	mm	mm	mm
6/10		–		(eShop)	5	combi	0	13	0.6	1325
8/12		eShop		eShop	5	combi	0	13	0.6	1325
10/14		–		(eShop)	5	combi	0	13	0.6	1325

TPI	11S	17 3557 Garant	16F	17 3560 RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 20×2375					degrees	mm	mm	mm
5/8		eShop		(eShop)	5	combi	0	20	0.9	2375
6/10		eShop		eShop	5	combi	0	20	0.9	2375
8/12		eShop		eShop	5	combi	0	20	0.9	2375
10/14		eShop		eShop	5	combi	0	20	0.9	2375

TPI	11S	17 3577 Garant	16F	17 3580 RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 27×2450					degrees	mm	mm	mm
4/6H		eShop		(eShop)	5	combi	10	27	0.9	2450
4/6		–		eShop	5	combi	0	27	0.9	2450
5/8		eShop		eShop	5	combi	0	27	0.9	2450
6/10		eShop		eShop	5	combi	0	27	0.9	2450
8/12		eShop		eShop	5	combi	0	27	0.9	2450
10/14		eShop		eShop	5	combi	0	27	0.9	2450

TPI	11S	17 3597 Garant	16F	17 3600 RÖNTGEN	12S	17 3605 HOLEX		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 27×2750							degrees	mm	mm	mm
4/6H		eShop		(eShop)	–		5	combi	10	27	0.9	2750
4/6		–		eShop	eShop		5	combi	0	27	0.9	2750
5/8		eShop		eShop	eShop		5	combi	0	27	0.9	2750
6/10		eShop		eShop	eShop		5	combi	0	27	0.9	2750
8/12		eShop		eShop	eShop		5	combi	0	27	0.9	2750
10/14		eShop		(eShop)	–		5	combi	0	27	0.9	2750

TPI	11S	17 3627	16F	17 3650		Tooth type	Rake	Width	Thickness	Length
		Garant		GRÖ RÖNTGEN						
		Metal band saw blade 27×2835					degrees	mm	mm	mm
4/6H		eShop		eShop	5	combi	10	27	0.9	2835
5/8		eShop		eShop	5	combi	0	27	0.9	2835
6/10		eShop		eShop	5	combi	0	27	0.9	2835
8/12		eShop		eShop	5	combi	0	27	0.9	2835
10/14		eShop		(eShop)	5	combi	0	27	0.9	2835

TPI	11S	17 3657	16F	17 3660		Tooth type	Rake	Width	Thickness	Length
		Garant		GRÖ RÖNTGEN						
		Metal band saw blade 27×2910					degrees	mm	mm	mm
4/6H		eShop		eShop	5	combi	10	27	0.9	2910
5/8		eShop		eShop	5	combi	0	27	0.9	2910
6/10		eShop		eShop	5	combi	0	27	0.9	2910
8/12		eShop		eShop	5	combi	0	27	0.9	2910

TPI	11S	17 3667	16F	17 3680		Tooth type	Rake	Width	Thickness	Length
		Garant		GRÖ RÖNTGEN						
		Metal band saw blade 27×2950					degrees	mm	mm	mm
4/6H		eShop		eShop	5	combi	10	27	0.9	2950
5/8		eShop		eShop	5	combi	0	27	0.9	2950
6/10		eShop		eShop	5	combi	0	27	0.9	2950
8/12		eShop		eShop	5	combi	0	27	0.9	2950

TPI	11S	17 3687	16F	17 3700		Tooth type	Rake	Width	Thickness	Length
		Garant		GRÖ RÖNTGEN						
		Metal band saw blade 27×3150					degrees	mm	mm	mm
4/6H		eShop		eShop	5	combi	10	27	0.9	3150
5/8		eShop		eShop	5	combi	0	27	0.9	3150
6/10		eShop		eShop	5	combi	0	27	0.9	3150
8/12		eShop		eShop	5	combi	0	27	0.9	3150
10/14		eShop		eShop	5	combi	0	27	0.9	3150

TPI	11S	17 3737	16F	17 3750	12S	17 3755		Tooth type	Rake	Width	Thickness	Length
		Garant		GRÖ RÖNTGEN		HOLEX						
		Metal band saw blade 27×3660							degrees	mm	mm	mm
3/4H		eShop		eShop		eShop	5	combi	10	27	0.9	3660
4/6H		eShop		eShop		eShop	5	combi	10	27	0.9	3660
5/6H		—		eShop		eShop	5	combi	10	27	0.9	3660
3/4		—		eShop		eShop	5	combi	0	27	0.9	3660
4/6		—		eShop		eShop	5	combi	0	27	0.9	3660
5/8		eShop		eShop		eShop	5	combi	0	27	0.9	3660
6/10		eShop		eShop		eShop	5	combi	0	27	0.9	3660
8/12		eShop		eShop		eShop	5	combi	0	27	0.9	3660
10/14		eShop		eShop		eShop	5	combi	0	27	0.9	3660
4H		—		eShop		—	5	normal	10	27	0.9	3660
6H		—		eShop		—	5	normal	10	27	0.9	3660
4		—		eShop		—	5	normal	0	27	0.9	3660
6		—		eShop		—	5	normal	0	27	0.9	3660
8		—		eShop		—	5	normal	0	27	0.9	3660
10		—		eShop		—	5	normal	0	27	0.9	3660

TPI	11S	17 3787	16F	17 3800		Tooth type	Rake	Width	Thickness	Length
		Garant		GRÖ RÖNTGEN						
		Metal band saw blade 27×3830					degrees	mm	mm	mm
3/4H		eShop		eShop	5	combi	10	27	0.9	3830
4/6H		eShop		eShop	5	Combi	10	27	0.9	3830
5/6H		—		eShop	5	combi	10	27	0.9	3830
5/8		eShop		eShop	5	combi	0	27	0.9	3830
6/10		eShop		eShop	5	combi	0	27	0.9	3830
8/12		eShop		(eShop)	5	combi	0	27	0.9	3830
10/14		eShop		(eShop)	5	combi	0	27	0.9	3830

TPI	11S	17 3837	16F	17 3850		Tooth type	Rake	Width	Thickness	Length
		Garant		GRÖ RÖNTGEN						
		Metal band saw blade 27×4150					degrees	mm	mm	mm
3/4H		eShop		eShop	5	combi	10	27	0.9	4150
4/6H		eShop		eShop	5	Combi	10	27	0.9	4150
5/6H		—		(eShop)	5	combi	10	27	0.9	4150
5/8		eShop		eShop	5	combi	0	27	0.9	4150
6/10		eShop		eShop	5	combi	0	27	0.9	4150
8/12		eShop		(eShop)	5	combi	0	27	0.9	4150

TPI	11S	17 3847	16F	17 3852		Tooth type	Rake	Width	Thickness	Length
		Garant		GRÖ RÖNTGEN						
		Metal band saw blade 34×3800					degrees	mm	mm	mm
3/4H		eShop		eShop	5	combi	10	34	1.1	3800
4/6H		eShop		eShop	5	combi	10	34	1.1	3800

TPI	11S	17 3848 Garant	16F	17 3854 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 34×4100					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	34	1.1	4100
3/4H		eShop		eShop	5	combi	10	34	1.1	4100
4/6H		eShop		eShop	5	combi	10	34	1.1	4100
TPI	11S	17 3849 Garant	16F	17 3856 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 34×4150					degrees	mm	mm	mm
3/4H		eShop		eShop	5	combi	10	34	1.1	4150
4/6H		eShop		eShop	5	combi	10	34	1.1	4150
TPI	11S	17 3851 Garant	16F	17 3858 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 34×4400					degrees	mm	mm	mm
3/4H		eShop		eShop	5	combi	10	34	1.1	4400
4/6H		eShop		eShop	5	combi	10	34	1.1	4400
TPI	11S	17 3853 Garant	16F	17 3859 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 34×4530					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	34	1.1	4530
3/4H		eShop		eShop	5	combi	10	34	1.1	4530
TPI	11S	17 3855 Garant	16F	17 3861 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 34×4570					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	34	1.1	4570
3/4H		eShop		eShop	5	combi	10	34	1.1	4570
TPI	11S	17 3857 Garant	16F	17 3860 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 34×4640					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	34	1.1	4640
3/4H		eShop		eShop	5	combi	10	34	1.1	4640
4/6H		eShop		eShop	5	combi	10	34	1.1	4640
TPI	11S	17 3863 Garant	16F	17 3864 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 34×5000					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	34	1.1	5000
3/4H		eShop		eShop	5	combi	10	34	1.1	5000
TPI	11S	17 3865 Garant	16F	17 3866 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 34×5090					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	34	1.1	5090
3/4H		eShop		eShop	5	combi	10	34	1.1	5090
TPI	11S	17 3868 Garant	16F	17 3870 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 41×4115					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	41	1.3	4115
3/4H		eShop		eShop	5	combi	10	41	1.3	4115
TPI	11S	17 3871 Garant	16F	17 3872 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 41×4640					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	41	1.3	4640
3/4H		eShop		eShop	5	combi	10	41	1.3	4640
TPI	11S	17 3873 Garant	16F	17 3874 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 41×5334					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	41	1.3	5334
3/4H		eShop		eShop	5	combi	10	41	1.3	5334
TPI	11S	17 3875 Garant	16F	17 3876 GRÖ RÖNTGEN		Tooth type	Rake	Width	Thickness	Length
		Metal band saw blade 41×5800					degrees	mm	mm	mm
2/3H		eShop		eShop	5	combi	10	41	1.3	5800
3/4H		eShop		eShop	5	combi	10	41	1.3	5800

HSS
Co8

Metal band saw blades welded to length as ordered

Note:

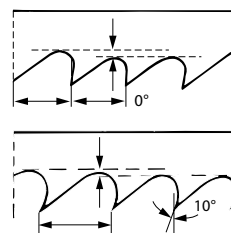
Our application engineers will gladly offer you further technical advice.
Further information can be found in the **GARANT machining handbook No. 110020** or from **RÖNTGEN Cutting Solutions (RCS)** at <https://www.roentgen-saw.com/RCS/>.

Price each = price per running metre × band length incl. welded joint.

Information required when placing an order: Length × width × thickness (mm) tooth format.

Example: 10 pieces No. 174000, 4870×34×1.1 - 3/4H -10°.

Use 3/4 0° and 4/6 0° variable pitch teeth only for pipes and profiles!



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	St < 750 N	St < 900 N	St < 1100 N	St < 1400 N	St < 55 HRC	St < 60 HRC	St < 65 HRC	St < 67 HRC	St < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni	Oil	Water	Emulsion	High pressure	High speed
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	N						
17 3905-17 4025		100		85	65	55	35	20					30				○	●	●	○		
17 4040		100		85	65	55	35	20					30	25	20	60	●	●	●	○		
17 4050-17 4064		100		85	65	55	35	20					30	20	20	60	○	●	●	○		
17 4105													30	20	20	60	●	●	●	○		

Variable pitch teeth 0° / 10°

17 3905 – **High-performance bi-metal band saw blade** with wear-resistant **M42 teeth** and special flexible backing with increased load capacity.

17 4000 – **bi-alpha-cobalt: High-performance bi-metal band saw blade** with **M42** high-speed alloy steel (HSS, 67-69 HRC) tooth tips and a high-alloy spring steel backing.

17 4025 – **Production band-saw blade** for high cutting performance.

Description: **Variable pitch teeth, 0°** – Very low vibration, for a large range of cross sections (for pipes and profiles, solid materials up to max. 70 mm).

Variable pitch teeth 10° – **General purpose** for a large range of cross sections (for solid materials from 50 mm).

3/4 – 10/14 teeth per inch: 0° variable pitch teeth

1.4/2H – 5/6H teeth per inch: 10° variable pitch teeth

Note:

17 3905 – **Successor product to No. 173900.**

Width×thickness	mm	20×0,9	27×0,9	34×1,1	41×1,3	54×1,6	
17 3905 GARANT Metal band saw blade, bi-metal		(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	5
1.4/2H TPI		—	—	—	●	●	
2/3H TPI		—	●	●	●	●	
3/4H TPI		—	●	●	●	●	
4/6H TPI		●	●	●	—	—	
5/8 TPI		●	●	●	—	—	
6/10 TPI		●	●	●	—	—	
8/12 TPI		●	●	●	—	—	
10/14 TPI		●	●	—	—	—	
Tooth type		combi					

width×thickness	mm	13×0,6	20×0,9	27×0,9	34×1,1	41×1,3	54×1,3	54×1,6	
17 4000 RÖNTGEN Metal band saw blade bi-alpha cobalt		(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	5
1.5/2H TPI		—	—	—	—	●	●	●	
2/3H TPI		—	—	●	●	●	●	●	
3/4H TPI		—	—	●	●	●	●	●	
4/5H TPI		—	—	●	●	●	●	●	
4/6H TPI		—	—	●	●	●	●	●	
5/6H TPI		—	—	●	●	—	—	●	
3/4 TPI		—	—	●	●	●	—	—	
4/6 TPI		—	—	●	●	●	—	—	
5/8 TPI		—	●	●	●	●	—	—	
6/10 TPI		●	●	●	●	●	—	—	
8/12 TPI		●	●	●	●	—	—	—	
10/14 TPI		●	●	●	—	—	—	—	
Tooth type		combi							

width×thickness	mm	13×0,6	20×0,9	27×0,9	34×1,1	41×1,3	
17 4025 HOLEX Metal band saw blade, bi-metal		(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	5
1.5/2H TPI		—	—	—	—	●	
2/3H TPI		—	—	●	●	●	
3/4H TPI		—	—	●	●	●	
4/5H TPI		—	—	●	●	●	
4/6H TPI		—	—	●	●	●	
5/6H TPI		—	—	●	●	—	
3/4 TPI		—	—	●	●	●	
4/6 TPI		—	—	●	●	●	
5/8 TPI		—	●	●	●	—	
6/10 TPI		●	●	●	●	—	
8/12 TPI		●	●	●	●	—	
10/14 TPI		●	●	●	—	—	
Tooth type		combi					

Variable pitch teeth 6°

- 17 4040 – **High-performance bi-metal band saw blade** with sturdy **profile tooth** and **positive rake angle**.
Aggressive cutting with **low tendency to vibrate**, resulting in a **very quiet sawing process**.
Proven **M42 teeth** and special flexible backing with increased load capacity.
Ideal for **sawing tasks that are prone to vibrations**, such as hollow and angled sections, carriers as well as material bundles and layer cuts, but also for flat material.
- 17 4062 – **bi-alfa Profile: High-performance bi-metal saw blade** with **M42 alloy high-speed steel (HSS)** tooth tips.
The **reinforced back of the tooth** increases the resistance to overloading of the tooth due to **vibrations during interrupted cutting**.
For tooth pitches **3/4 and 4/6**, an **optimised tooth profile** ensures high performance in **process-controlled sawing operation**.
- 17 4064 – **Bi-alfa profile WS: High-performance bi-metal saw blade** with **M42 alloy high-speed steel (HSS)** tooth tips.
The **reinforced back of the tooth** increases the resistance to overloading of the tooth due to **vibrations during interrupted cutting**.
The WS version generates a wide cutting channel to prevent jamming, especially for materials with internal stresses.
The **optimised tooth profile** ensures high performance in **process-controlled sawing operation**.

width×thickness	mm	27×0,9	34×1,1	41×1,3	
17 4040  Metal band saw blade, bi-metal Profile tooth		(eShop)	(eShop)	(eShop)	5
2/3 TPI		—	●	—	
3/4 TPI		—	●	—	
4/6 TPI		●	●	—	
5/7 TPI		●	●	—	
8/11 TPI		●	—	—	
Tooth type		Combi			
Rake	degrees	6			

width×thickness	mm	13×0,6	20×0,9	27×0,9	34×1,1	41×1,3	54×1,6	
17 4062  Metal band saw blade bi-alfa Profile		(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	5
3/4 TPI		—	—	●	●	●	●	
4/6 TPI		—	—	●	●	●	●	
5/7 TPI		—	—	●	●	●	—	
8/11 TPI		●	●	●	●	—	—	
12/16 TPI		—	●	●	—	—	—	
Tooth type		combi						
Rake	degrees	6						

width×thickness	mm	34×1,1	41×1,3	54×1,6	
17 4064  Metal band saw blade bi-alfa Profile WS		(eShop)	(eShop)	(eShop)	5
3/4 TPI		—	●	—	
Tooth type		combi			
Rake	degrees	6			

Variable pitch teeth 10° ground

bi-alfa Master: High-performance bi-metal saw blade with **M42 alloy high-speed steel (HSS)** tooth tips.
With **special ground finish on the taper tap** (tooth height difference) for improved cutting guidance.
Optimally suitable for solid material (from 50 mm) of all common **high and very high-alloy steel grades** up to a hardness of <45 HRC.

width×thickness	mm	27×0,9	34×1,1	41×1,3	
17 4050  Metal band saw blade bi-alfa Master		(eShop)	(eShop)	(eShop)	5
1.5/2H TPI		—	—	●	
2/3H TPI		—	●	●	
3/4H TPI		●	●	●	
Tooth type		combi			
Rake	degrees	10			

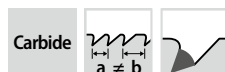
Variable pitch teeth 16° ground

Master Supreme: Tooth tips made of high-speed alloy steel (HSS) M51, with **increased thermal and mechanical wear resistance**.
The ground **taper tap improves the cutting guidance** and the cutting behaviour, especially for large material cross-sections and the **extra-wide teeth setting prevents jamming of materials with internal stresses** (e.g. forgings).
Ideal for machining **high and very high-alloy steel grades**.

Width×thickness	mm	34×1,1	41×1,3	54×1,3	54×1,6	
17 4105  Metal band saw blade Master Supreme		(eShop)	(eShop)	(eShop)	(eShop)	5
1.1/1.6 TPI		—	—	—	●	
1.5/2 TPI		—	●	●	●	
2/3 TPI		—	●	—	—	
3/4 TPI		●	—	—	—	
Tooth type		combi				
Rake	degrees	16				



17



Carbide-tipped band saw blades, welded to length as ordered

RÖNTGEN carbide titanium:

Carbide-tipped band saw blade with ground tooth profiles. (Hardness approx. 1600 HV). Very high rate of metal removal.

Note:

When placing an enquiry, please indicate the band saw machine (manufacturer and type), band dimensions, material, and material cross section.

General-purpose small workshop machines (tilting frame bandsaws with saw blade width 27×0.9 mm) are generally not designed for use with carbide-tipped saw blades.

Our application engineers will gladly offer you further technical advice.

Further information can be found in the **GARANT machining handbook No. 110020** or from **RÖNTGEN Cutting Solutions (RCS)** at <https://www.roentgen-saw.com/RCS/>.

Price each = price per running metre × band length incl. welded joint.

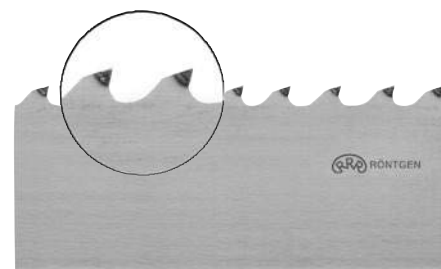
Order information: Item number and size (teeth per inch) × desired length (mm).

Example: 5 pieces No. 174113 size 2/3 × 4640 mm.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
174111–174117/ 4151–174156	100	100	70	90	80	70	60	50					70	60	60	80	80	●		●			
174121–174131									100	90	85									●			
174182–174187	110	110	80	100	90	80	65	55					80	65	65	90	90	●		●			

Carbide-titanium MU

Tooth tips made of **high-quality carbide (HM) with positive rake angle (10°)** and a backing made of high-alloy spring steel. Suitable for **general applications**, especially in all common steel grades up to a tensile strength of 1700 N/mm². The **smooth running** and **optimised cutting surface** are achieved by a **highly precise grinding geometry of the teeth**.



174111

TPI	16F 174111	16F 174112	16F 174113	16F 174114	16F 174115	16F 174116	16F 174117	Tooth type	Rake
	Carbide-tipped band saw blade Carbide - titanium MU								
	Width × thickness 27 × 0.9 mm	Width × thickness 34 × 1.1 mm	Width × thickness 41 × 1.3 mm	Width × thickness 54 × 1.3 mm	Width × thickness 54 × 1.6 mm	Width × thickness 67 × 1.6 mm	Width × thickness 80 × 1.6 mm		degrees
0,85/1,15	–	–	–	–	(eShop)	(eShop)	–	Combi	10
1,1/1,6	–	–	–	–	(eShop)	(eShop)	(eShop)	Combi	10
1,5/2	–	–	(eShop)	(eShop)	(eShop)	(eShop)	–	Combi	10
2/3	–	(eShop)	(eShop)	(eShop)	(eShop)	–	–	Combi	10
3/4	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	–	–	Combi	10

Carbide - titanium B0

Carbide (HM) tipped high-performance saw blade with special geometry and a rake angle of 0°. Especially suitable for **hardened/induction-hardened and high-hardness materials > 50 HRC**. The B0 can be used on sawing machines with limited power.

Note:

174122/4123 Size 3/4 – For the configurations, a forte C-coated variant with a performance increase of 20-30% is available on request.



174121

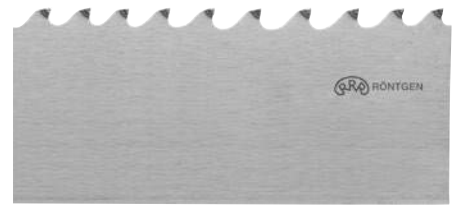
TPI	16F 174121	16F 174122	16F 174123	16F 174125	16F 174124	Tooth type	Rake
	Carbide-tipped band saw blade Carbide - titanium B0						
	Width × thickness 27 × 0.9 mm	Width × thickness 34 × 1.1 mm	Width × thickness 41 × 1.3 mm	Width × thickness 54 × 1.3 mm	Width × thickness 54 × 1.6 mm		degrees
1,5/2	–	–	(eShop)	–	–	Combi	0
2/3	–	(eShop)	(eShop)	(eShop)	(eShop)	Combi	0
3/4	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	Combi	0

Carbide-titanium MUSN

Carbide (HM) tipped high-performance saw blade with a **negative rake angle (-18°)** and **special tooth geometry** to increase the machining parameters. Especially suitable for sawing hardened/induction-hardened and high-hardness materials >50 HRC. Use requires a **powerful band saw machine**.

Note:

Size 3/4 – For the configurations, a forte C-coated variant with a performance increase of 20-30% is available on request.



17 4130

TPI	16F	17 4130	16F	17 4131	Tooth type	Rake
		Carbide-tipped band saw blade Carbide-titanium MUSN				
		Width × thickness 34 × 1.1 mm		Width × thickness 41 × 1.3 mm		degrees
2/3		–		(eShop)	Combi	–18
3/4		(eShop)		(eShop)	Combi	–18

Carbide-titanium nSET

Carbide (HM) tipped high-performance saw blade with a **positive rake angle (11°)**. The **normal set** generates a cutting channel in which the **jamming of the saw blade is prevented, especially in the case of internal material stresses** (e.g. in Inconel, Hastelloy or forged materials). Suitable for sawing all common types of steel up to a tensile strength of 1700 N/mm² and especially for **large contact lengths**. The saw blade can also be used on powerful bi-metal sawing machines.

Note:

Quality carbide-titanium SET (item number 174161 to 174167) is still available. Just contact us with your request.

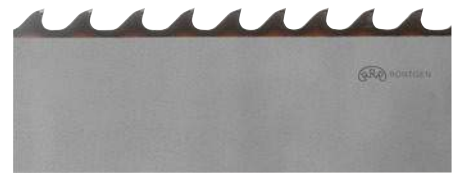


17 4151

TPI	16F	17 4151	16F	17 4152	16F	17 4153	16F	17 4154	16F	17 4155	16F	17 4156	Tooth type	Rake
		Carbide-tipped band saw blade Carbide-titanium nSET												
		Width × thickness 27 × 0.9 mm		Width × thickness 34 × 1.1 mm		Width × thickness 41 × 1.3 mm		Width × thickness 54 × 1.3 mm		Width × thickness 54 × 1.6 mm		Width × thickness 67 × 1.6 mm		degrees
1,1/1,6		–		–		–		–		–		(eShop)	Combi	11
1,5/2		–		–		(eShop)		(eShop)		(eShop)		(eShop)	Combi	11
2/3		–		(eShop)		(eShop)		(eShop)		(eShop)		–	Combi	11
3/4		(eShop)		(eShop)		(eShop)		(eShop)		(eShop)		–	Combi	11

Carbide-titanium forte C

Carbide (HM) tipped high-performance saw blade with a **positive rake angle (10°)** and **special tooth geometry** to increase the machining parameters. Performance increase in comparison to the quality carbide-titanium MU of 10-30% with the same tool life due to **forte C coating**. The **cutting edges are pre-rounded**, eliminating the need to run the belt in.



17 4182

TPI	16F	17 4182	16F	17 4183	16F	17 4184	16F	17 4185	16F	17 4186	16F	17 4187	Tooth type	Rake
		Carbide-tipped band saw blade Carbide-titanium forte C												
		Width × thickness 34 × 1.1 mm		Width × thickness 41 × 1.3 mm		Width × thickness 54 × 1.3 mm		Width × thickness 54 × 1.6 mm		Width × thickness 67 × 1.6 mm		Width × thickness 80 × 1.6 mm		degrees
0,85/1,15		–		–		–		–		(eShop)		–	Combi	10
1,1/1,6		–		–		–		(eShop)		(eShop)		(eShop)	Combi	10
1,5/2		–		(eShop)		(eShop)		(eShop)		–		–	Combi	10
2/3		(eShop)		(eShop)		(eShop)		(eShop)		–		–	Combi	10
3/4		–		(eShop)		–		–		–		–	Combi	10



Metal band-saw blades

Tooth spacing for carbide-titanium saw blades

Tooth pitch	Material Ø
0.85/1.15	> 500 mm
1.1/1.6	350 – 600 mm
1.5/2	150 – 400 mm
2/3	100 – 250 mm
3/4	50 – 120 mm

Type **carbide-titanium ALU** (specially for aluminium materials) available on request.

Different versions are available depending on the available bandsaw and component shape (plates, castings, pipes).



HSS

Re-Bo Metal circular saw blades

All blades are hollow ground to give side clearance.

All sizes with 200 mm Ø and very thin blades have a bore collar for stabilisation.

Accuracy, tooth form, and side clearance grinding according to DIN 1840.

- 17 5000 – **DIN 1837 A fine-toothed** with raked teeth form A.
Straight teeth with relatively small indentations.
- 17 5500 – **DIN 1838 B coarse-toothed** with curved form B.
Curved teeth with relatively large tooth indentations.
- 17 6000 – **DIN 1838 C coarse-toothed** with curved form C.
High performance tooth pitch (HZ) **with high teeth and lower finishing teeth**. The roughing tooth is 0.15 – 0.30 mm higher than the finishing tooth and is chamfered at both tooth corners. In this way both types of teeth share the cutting work.

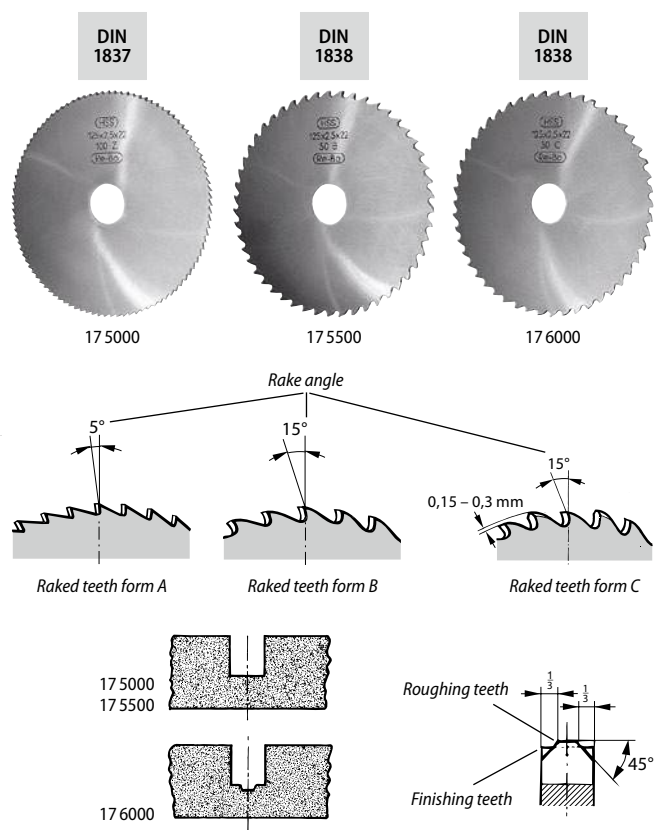
Application:

- 17 5000 – For thin-walled components and small cutting depths.
- 17 5500 – These blades are suitable for more universal use due to the improved chip formation and larger gullets compared to No. 175000. Should be used for thicker materials and greater cutting depths.
- 17 6000 – Particularly suitable for cutting workpieces with low to medium tensile strength. High cutting performance due to the chip breaking tooth form.

Please note: If the component is not cut through, but only cut into, the bottom of the cut will have an additional slot due to the projecting high tooth.

Note:

The concentricity and axial run-out values are considerably better than the figures according to DIN 1840, in some cases by up to 50 %.



Arbors for saw blades
Ø 20 – 100 mm
see No. 34 5510 / 34 5555

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
17 5000				37	22	20	15							11	11	27	400	●			○	○	
17 5500/6000		800	600	37	22	20	15							11	11	27	400	●			○	○	

Ø× thickness	17A 17 5000 Metal circular saw blade	Thickness	Bore Ø	No. of teeth Z
mm	fine	mm	mm	
20×0,2	eShop	0.2	5	80
20×0,25	(eShop)	0.25	5	64
20×0,3	eShop	0.3	5	64
20×0,4	eShop	0.4	5	64
20×0,5	eShop	0.5	5	50
20×0,6	eShop	0.6	5	50
20×0,8	eShop	0.8	5	50
20×1	eShop	1	5	40
20×1,2	eShop	1.2	5	40
20×1,6	eShop	1.6	5	40
20×2	eShop	2	5	32
20×2,5	(eShop)	2.5	5	32
20×3	(eShop)	3	5	32
20×6	(eShop)	6	5	24
25×0,2	(eShop)	0.2	8	80
25×0,3	eShop	0.3	8	80
25×0,4	(eShop)	0.4	8	64
25×0,5	eShop	0.5	8	64
25×0,6	eShop	0.6	8	64
25×0,8	eShop	0.8	8	50
25×1	eShop	1	8	50
25×1,2	eShop	1.2	8	50
25×1,6	eShop	1.6	8	40
25×2	eShop	2	8	40

Ø× thickness	17A 17 5000 Metal circular saw blade	Thickness	Bore Ø	No. of teeth Z
mm	fine	mm	mm	
25×2,5	eShop	2.5	8	40
25×3	(eShop)	3	8	32
32×0,2	eShop	0.2	8	100
32×0,25	(eShop)	0.25	8	100
32×0,3	eShop	0.3	8	80
32×0,4	eShop	0.4	8	80
32×0,5	eShop	0.5	8	80
32×0,6	eShop	0.6	8	64
32×0,8	eShop	0.8	8	64
32×1	eShop	1	8	64
32×1,2	eShop	1.2	8	50
32×1,6	eShop	1.6	8	50
32×2	eShop	2	8	50
32×2,5	eShop	2.5	8	40
32×3	eShop	3	8	40
32×6	(eShop)	6	8	32
40×0,2	eShop	0.2	10	128
40×0,25	(eShop)	0.25	10	100
40×0,3	eShop	0.3	10	100
40×0,4	eShop	0.4	10	100
40×0,5	eShop	0.5	10	80
40×0,6	eShop	0.6	10	80
40×0,8	eShop	0.8	10	80
40×1	eShop	1	10	64

Ø× thickness	17A 17 5000	17A 17 5500	17A 17 6000	Thick- ness	Bore Ø	No. of teeth Z		Ø× thickness	17A 17 5000	17A 17 5500	17A 17 6000	Thick- ness	Bore Ø	No. of teeth Z	
Metal circular saw blade								Metal circular saw blade							
mm	fine	coarse	coarse HZ	mm	mm	17 5000	17 5500 17 6000	mm	fine	coarse	coarse HZ	mm	mm	17 5000	17 5500 17 6000
40×1,2	eShop	—	—	1.2	10	64	—	80×2,5	eShop	eShop	(eShop)	2.5	22	80	40
40×1,6	eShop	—	—	1.6	10	64	—	80×3	eShop	eShop	(eShop)	3	22	80	40
40×2	eShop	—	—	2	10	50	—	80×4	eShop	(eShop)	eShop	4	22	64	32
40×2,5	eShop	—	—	2.5	10	50	—	80×5	(eShop)	(eShop)	(eShop)	5	22	64	32
40×3	eShop	—	—	3	10	50	—	80×6	(eShop)	(eShop)	(eShop)	6	22	64	32
40×4	eShop	—	—	4	10	40	—	100×0,5	eShop	eShop	—	0.5	22	160	80
40×5	(eShop)	—	—	5	10	40	—	100×0,6	eShop	(eShop)	—	0.6	22	160	80
40×6	(eShop)	—	—	6	10	40	—	100×0,8	eShop	eShop	—	0.8	22	128	64
50×0,2	eShop	—	—	0.2	13	128	—	100×1	eShop	eShop	eShop	1	22	128	64
50×0,3	eShop	—	—	0.3	13	128	—	100×1,2	eShop	eShop	(eShop)	1.2	22	128	64
50×0,4	(eShop)	—	—	0.4	13	100	—	100×1,6	eShop	eShop	eShop	1.6	22	100	50
50×0,5	eShop	eShop	—	0.5	13	100	50	100×2	eShop	eShop	eShop	2	22	100	50
50×0,6	eShop	eShop	—	0.6	13	100	50	100×2,5	eShop	eShop	(eShop)	2.5	22	100	50
50×0,8	eShop	eShop	—	0.8	13	80	40	100×3	eShop	eShop	eShop	3	22	80	40
50×1	eShop	eShop	(eShop)	1	13	80	40	100×4	(eShop)	eShop	(eShop)	4	22	80	40
50×1,2	eShop	eShop	(eShop)	1.2	13	80	40	100×5	(eShop)	(eShop)	(eShop)	5	22	80	40
50×1,6	eShop	eShop	(eShop)	1.6	13	64	32	125×0,6	eShop	eShop	—	0.6	22	160	80
50×2	eShop	eShop	(eShop)	2	13	64	32	125×0,8	(eShop)	(eShop)	—	0.8	22	160	80
50×2,5	(eShop)	(eShop)	(eShop)	2.5	13	64	32	125×1	eShop	eShop	eShop	1	22	160	80
50×3	eShop	(eShop)	(eShop)	3	13	50	24	125×1,2	eShop	(eShop)	eShop	1.2	22	128	64
50×4	(eShop)	(eShop)	(eShop)	4	13	50	24	125×1,6	eShop	eShop	eShop	1.6	22	128	64
50×6	(eShop)	(eShop)	(eShop)	6	13	40	20	125×2	eShop	eShop	eShop	2	22	128	64
63×0,25	eShop	—	—	0.25	16	160	—	125×2,5	(eShop)	eShop	(eShop)	2.5	22	100	50
63×0,3	eShop	—	—	0.3	16	128	—	125×3	eShop	eShop	eShop	3	22	100	50
63×0,4	eShop	—	—	0.4	16	128	—	125×4	(eShop)	(eShop)	eShop	4	22	100	50
63×0,5	eShop	eShop	—	0.5	16	128	64	125×5	eShop	(eShop)	(eShop)	5	22	80	40
63×0,6	eShop	(eShop)	—	0.6	16	100	50	125×6	(eShop)	(eShop)	(eShop)	6	22	80	40
63×0,8	eShop	eShop	—	0.8	16	100	50	160×1	eShop	(eShop)	(eShop)	1	32	160	80
63×1	eShop	eShop	eShop	1	16	100	50	160×1,2	(eShop)	(eShop)	(eShop)	1.2	32	160	80
63×1,2	eShop	eShop	eShop	1.2	16	80	40	160×1,6	eShop	eShop	eShop	1.6	32	160	80
63×1,6	eShop	eShop	(eShop)	1.6	16	80	40	160×2	eShop	eShop	eShop	2	32	128	64
63×2	eShop	eShop	eShop	2	16	80	40	160×2,5	(eShop)	(eShop)	(eShop)	2.5	32	128	64
63×2,5	eShop	eShop	(eShop)	2.5	16	64	32	160×3	(eShop)	eShop	eShop	3	32	128	64
63×3	eShop	eShop	(eShop)	3	16	64	32	160×4	(eShop)	(eShop)	(eShop)	4	32	100	50
63×4	eShop	eShop	(eShop)	4	16	64	32	160×5	(eShop)	(eShop)	(eShop)	5	32	100	50
63×5	(eShop)	(eShop)	(eShop)	5	16	50	24	160×6	(eShop)	(eShop)	(eShop)	6	32	100	50
63×6	(eShop)	(eShop)	(eShop)	6	16	50	24	200×1	eShop	eShop	(eShop)	1	32	200	100
80×0,3	eShop	—	—	0.3	22	160	—	200×1,2	eShop	(eShop)	(eShop)	1.2	32	200	100
80×0,4	eShop	—	—	0.4	22	160	—	200×1,6	eShop	(eShop)	(eShop)	1.6	32	160	80
80×0,5	eShop	eShop	—	0.5	22	128	64	200×2	eShop	eShop	eShop	2	32	160	80
80×0,6	eShop	(eShop)	—	0.6	22	128	64	200×2,5	(eShop)	eShop	(eShop)	2.5	32	160	80
80×0,8	eShop	eShop	—	0.8	22	128	64	200×3	eShop	(eShop)	eShop	3	32	128	64
80×1	eShop	eShop	eShop	1	22	100	50	200×4	(eShop)	(eShop)	(eShop)	4	32	128	64
80×1,2	eShop	eShop	eShop	1.2	22	100	50	200×5	(eShop)	(eShop)	(eShop)	5	32	128	64
80×1,6	eShop	eShop	(eShop)	1.6	22	100	50	200×6	(eShop)	(eShop)	(eShop)	6	32	100	50
80×2	eShop	eShop	eShop	2	22	80	40								

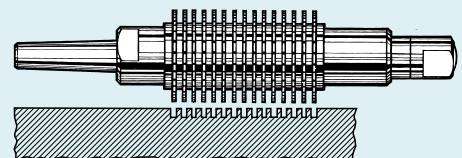
Metal circular saw blades for special applications

Please make a note on your order if you want to use the metal circular saw blades in sets.

These blades will then be gauged as a set and ground plane parallel as a precision matched set, hollow ground from teeth to collar (spacer ring Ø). This arrangement must be made to order. We also need further information on the order if dimensional tolerances are tighter than DIN, or for special tooth formats or fully surface ground types, for keyways or pinholes etc.

On request:

- Metal circular saw blades with hard coating "Re-Bo-TiN" or "Re-Bo-Top" for difficult machining applications in industrial use.
- Driving slots can be produced if required.



HSS

Metal circular saw blades

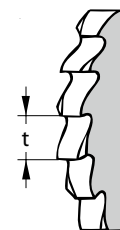
Application: On low speed machines (approx. 50 rpm).

Pitch t: (tooth form).

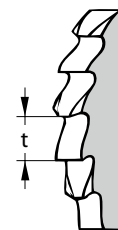
- 4 mm (BW) – For profiles and pipes with 1.0 – 1.5 mm wall thickness.
- 5 / 6 mm (HZ) – For medium profiles, tubes and solid material with 1.5 – 20 mm wall thickness or cross-section.
- 7 / 8 mm (HZ) – For thick profiles and solid materials up to approx. 50 mm wall thickness or cross-section.
- 10 – 16 mm (HZ) – For extra thick cross-sections and solid material more than 50 mm.

Note:

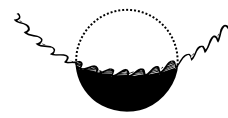
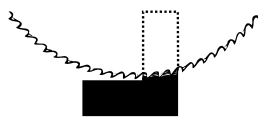
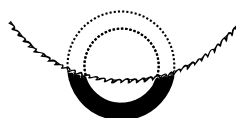
- **For stainless steels (such as V2A)** the correct cutting speed and lubrication is crucial (see information in the machining handbook, No. 110020).
- The concentricity and axial run-out values are considerably better than the figures according to DIN 1840, in some cases by up to 50 %.



t 4 mm = **BW**
curved teeth set
alternately



t from 5 mm = **HZ**
tooth configuration with
roughing and finishing
teeth



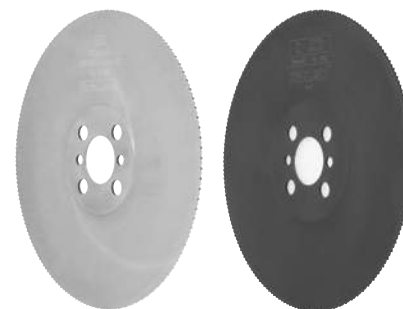
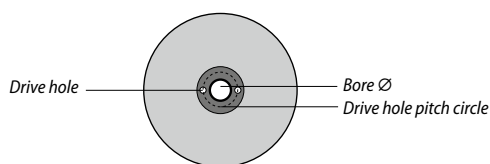
Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
17 7000/7200/7400		800	600	37	22	20	15						11	11	15	27	400	●	●		○	○
17 7055/7255/7455		800	600	37	22	20										27	400	●	●		○	○
17 7070		800	800	55	42	38	28						24	20	26	45	600	●	●	●	○	○

Metal circular saw blades, fine version

- 17 7000 – **German top quality product.** Precision tooth geometry and very fine ground side faces. Significant increase in service life and protection against edge build-up due to the **nitrided surface**.
- 17 7055 – Precise format and good quality for a competitive price. **Vaporised surface** protects against edge build-up.

Note:

17 7055 – **Successor product to No. 177050.**



17 7000

17 7055

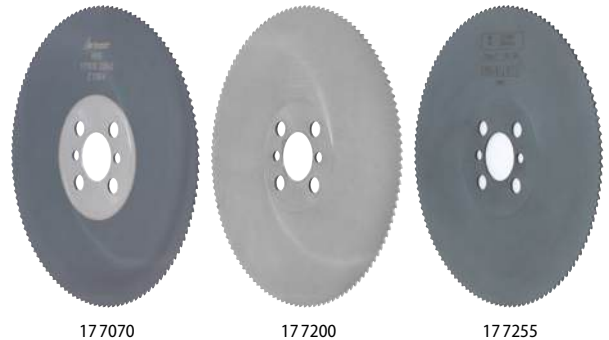
Ø×thickness	178 17 7000	121 17 7055	Thickness	Bore Ø	No. of teeth Z	Pitch t	Number of drive holes		Drive hole Ø		Drive hole pitch circle		suitable for saw makes
	Re-Bo	HOLEX					17 7000	17 7055	17 7000	17 7055	17 7000	17 7055	
mm	fine		mm	mm		mm			mm	mm	mm	mm	
225×2/K	eShop	eShop	2	32	180	4	2	2; 2; 4	8	8; 11; 9	45	45; 63; 50	Eisele
225×2	(eShop)	eShop	2	40	180	4	2	2; 4	8	8; 12	55	55; 64	Eisele
250×2/K	–	eShop	2	32	200	4	–	2; 2; 4	–	8; 11; 9	–	45; 63; 50	Adige; Berg & Schmid; Bewo; IBP; Thomas
250×2	eShop	eShop	2	40	200	4	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
250×2,5	(eShop)	eShop	2.5	40	200	4	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
275×2	eShop	eShop	2	40	220	4	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
275×2,5	eShop	eShop	2.5	40	220	4	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
300×2,5/K	–	eShop	2.5	32	220	4	–	2; 2; 4	–	8; 9; 11	–	45; 63; 50	Eisele; Trennjäger Adige; Berg & Schmid; Bewo; IBP; Thomas
300×2,5	eShop	eShop	2.5	40	220	4	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
315×2,5	eShop	eShop	2.5	40	220	4	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
315×3	eShop	eShop	3	40	160	6	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
350×3	eShop	eShop	3	40	180	6	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
370×3/G	–	eShop	3	50	160	7	–	4; 4	–	15; 14	–	80; 85	Kaltenbach
400×3/G	–	eShop	3	50	180	7	–	4; 4	–	15; 14	–	80; 85	Kaltenbach
400×3,5	(eShop)	–	3.5	40	160	8	2	–	11	–	65	–	Eisele

Metal circular saw blades, medium version

- 17 7070 – Top quality **with TiAlN coating** for the highest blade life requirements. Shorter sawing times due to higher cutting speeds.
- 17 7200 – **German top quality product.** Precision tooth geometry and very fine ground side faces. Significant increase in service life and protection against edge build-up due to the **nitrided surface**.
- 17 7255 – Precise format and good quality for a competitive price. **Vaporised surface** protects against edge build-up.

Note:

- 17 7070 – **Successor product to No. 177060.**
- 17 7255 – **Successor product to No. 177250.**



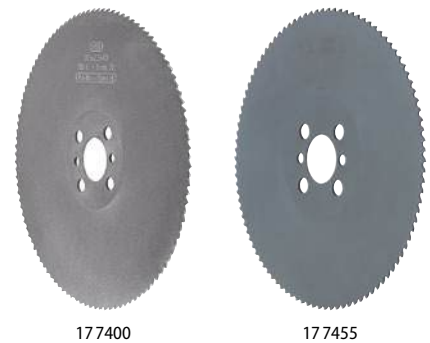
Ø×thickness	17 7070	17 7200	17 7255	Thickness	Bore Ø	No. of teeth Z	Pitch t	Number of drive holes		Drive hole Ø		Drive hole pitch circle		suitable for saw makes
	Garant	Re-Bo	HOLEX					17 7070	17 7255	17 7070	17 7255	17 7070	17 7255	
	Circular saw blade							17 7200		17 7200		17 7200		
mm	medium			mm	mm		mm			mm	mm	mm	mm	
225×2/K	—	eShop	eShop	2	32	120	6	2	2; 2; 4	8	8; 11; 9	45	45; 63; 50	Eisele
225×2	—	(eShop)	eShop	2	40	120	6	2	2; 4	8	8; 12	55	55; 64	Eisele
250×2/K	—	—	eShop	2	32	160	5	—	2; 2; 4	—	8; 11; 9	—	45; 63; 50	Adige; Berg & Schmid; Bewo; IBP; Thomas
250×2	eShop	eShop	eShop	2	40	128	6	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
250×2,5	—	eShop	eShop	2.5	40	128	6	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
275×2	—	eShop	eShop	2	40	140	6	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
275×2,5	eShop	eShop	eShop	2.5	40	140	6	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele; Trennjäger
300×2,5/K	—	—	eShop	2.5	32	160	6	—	2; 2; 4	—	8; 11; 9	—	45; 63; 50	Adige; Berg & Schmid; Bewo; IBP; Thomas
300×2,5	eShop	eShop	eShop	2.5	40	160	6	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
315×2,5	eShop	eShop	eShop	2.5	40	160	6	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
315×3	—	eShop	eShop	3	40	120	8	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
350×3	eShop	eShop	eShop	3	40	140	8	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
370×3/G	—	—	eShop	3	50	120	10	—	4; 4	—	15; 14	—	80; 85	Kaltenbach
400×3	—	(eShop)	—	3	40	128	10	2	—	11	—	55	—	Eisele
400×3/G	—	—	eShop	3	50	100	12	—	4; 4	—	15; 14	—	80; 85	Kaltenbach
400×3,5	—	(eShop)	—	3.5	40	128	10	2	—	11	—	65	—	Eisele

Metal circular saw blades, coarse version

- 17 7400 – **German top quality product.** Precision tooth geometry and very fine ground side faces. Significant increase in service life and protection against edge build-up due to the **nitrided surface**.
- 17 7455 – Precise format and good quality for a competitive price. **Vaporised surface** protects against edge build-up.

Note:

- 17 7455 – **Successor product to No. 177450.**



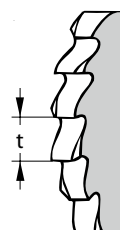
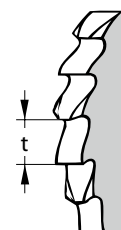
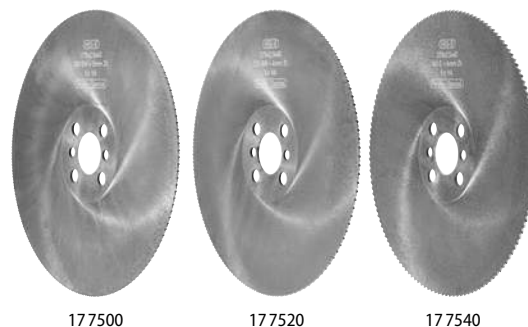
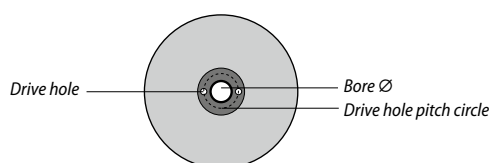
Ø×thickness	17 7400	17 7455	Thickness	Bore Ø	No. of teeth Z	Pitch t	Number of drive holes		Drive hole Ø		Drive hole pitch circle		suitable for saw makes
	Re-Bo	HOLEX					17 7400	17 7455	17 7400	17 7455	17 7400	17 7455	
	Circular saw blade								mm	mm	mm	mm	
mm	coarse		mm	mm		mm							
225×2/K	—	eShop	2	32	90	8	—	2; 2; 4	—	8; 11; 19	—	45; 63; 50	Eisele
225×2	(eShop)	eShop	2	40	90	8	2	2; 4	8	8; 12	55	55; 64	Eisele
250×2/K	—	eShop	2	32	128	6	—	2; 2; 4	—	8; 11; 19	—	45; 63; 50	Adige; Berg & Schmid; Bewo; IBP; Thomas
250×2	(eShop)	eShop	2	40	100	8	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
275×2	(eShop)	eShop	2	40	110	8	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
275×2,5	eShop	eShop	2.5	40	110	8	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele; Trennjäger
300×2,5/K	—	eShop	2.5	32	120	8	—	2; 2; 4	—	8; 11; 19	—	45; 63; 50	Adige; Berg & Schmid; Bewo; IBP; Thomas
300×2,5	eShop	eShop	2.5	40	120	8	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
315×2,5	eShop	eShop	2.5	40	120	8	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
315×3	eShop	eShop	3	40	100	10	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
350×3	eShop	eShop	3	40	110	10	2; 4	2; 4	8; 12	8; 12	55; 64	55; 64	Eisele
370×3/G	—	eShop	3	50	100	12	—	4; 4	—	15; 14	—	80; 85	Kaltenbach
400×3/G	—	eShop	3	50	80	16	—	4; 4	—	15; 14	—	80; 85	Kaltenbach
400×3,5	(eShop)	—	3.5	40	100	12	2	—	11	—	65	—	Eisele

HSS
E**Re-Bo VA circular saw blades, for stainless steels**Precision toothing and very fine ground side faces. **Rake angle especially for stainless steels.****Nitrided surface:** hard, durable protection against edge build-up.**Suitable for:** EISELE and TRENNJAEGER cold circular saws.**Application:** Pitch t: (tooth form)

- 3 mm (BW) – For thin pipes, profiles, sheet metal with 1 – 2 mm wall thickness.
- 4 mm (BW) – For pipes, profiles, sheet metal with 1.5 – 4 mm wall thickness.
- 6 mm (HZ) – For pipes, profiles and solid material above 4 mm wall thickness or cross-section up to a maximum of 50 mm.
- 8 mm (HZ) – For solid material above 50 mm.

Note:

- For optimum performance and service life: use coolant concentrate No. 084260.
- The concentricity and axial run-out values are considerably better than the figures according to DIN 1840, in some cases by up to 50 %.

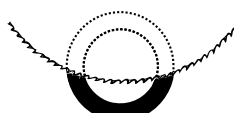
T 3/4 mm = BW
curved teeth set alternatelyt 6/8 mm = HZ
tooth configuration with
roughing and finishing teeth

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	K	N				
17 7500–17 7540				37	22	20	15	11						11	11	15	27	400	●	●	○	○

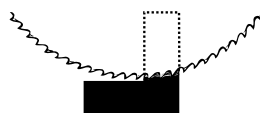
Ø×thick- ness	17B 17 7500	17B 17 7520	17B 17 7540	Thickness	Bore Ø	No. of teeth Z			Pitch t			Number of drive holes	Drive hole Ø	Drive hole pitch circle
	Stainless steel circular saw blade					17 7500	17 7520	17 7540	17 7500	17 7520	17 7540			
mm	fine	medium	coarse	mm	mm				mm	mm	mm		mm	mm
250×2	eShop	eShop	(eShop)	2	40	250	200	128	3	4	6	2; 4	9; 12	55; 64
275×2,5	eShop	eShop	eShop	2.5	40	280	220	140	3	4	6	2; 4	9; 12	55; 64
300×2,5	(eShop)	(eShop)	(eShop)	2.5	40	220	160	120	4	6	8	2; 4	9; 12	55; 64
315×3	eShop	eShop	(eShop)	3	40	220	160	120	4	6	8	2; 4	9; 12	55; 64
350×3	eShop	eShop	eShop	3	40	280	180	140	4	6	8	2; 4	9; 12	55; 64

HSS
E**Re-Bo Metal circular saw blades****Top quality German product,** hollow ground with precision tooth format.**Suitable for:** GF and AXX Air.Tooth form BW curved teeth set
alternately

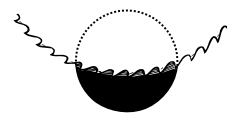
17 8860



F = fine



M = medium



G = coarse

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
17 8860				37	22	20	15							11	11	15	27	400	●	●	○	○

Ø×thick- ness	17B 17 8860	Thickness	Bore Ø	No. of teeth Z	Ø×thick- ness	17B 17 8860	Thickness	Bore Ø	No. of teeth Z
	Metal circular saw blade					Metal circular saw blade			
mm		mm	mm		mm		mm	mm	
63×1,6M	(eShop)	1.6	16	64	68×1,6M	(eShop)	1.6	16	64
68×1,6F	(eShop)	1.6	16	72	68×1,6G	(eShop)	1.6	16	44

Carbide



Garant Carbide tipped circular saw blades for non-ferrous metals

High performance toothing with high teeth and lower finishing teeth. The trapezoidal carbide tips cut easily and generate clean cut surfaces.

Advantage: Particularly suitable for hard anodised profile material.

Application: On high-speed machines.

F = fine tooth pitch for thin walled profiles or plates up to 5 mm thickness.

M = medium tooth pitch for profiles and pipes with greater than 5 mm thickness.

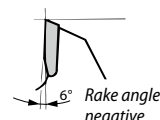
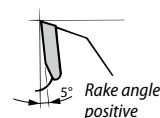
G = coarse tooth pitch for solid material such as bars and rods.

17 9600 – **Positive rake angle 5°** for smooth, burr-free cutting on machines with saw blade infeed from below or horizontal. Very suitable for cutting to size, for mitre and ripping cuts on profiles, and for cutting into solid material.

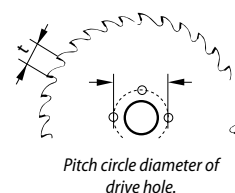
17 9700 – **Negative rake angle 6°** for use on machines with oscillating saw blade infeed from above. Advantageous for thin profiles.

Note:

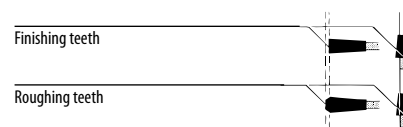
- Recommended cutting speed: 40 – 80 m/s, for harder materials such as alloys, brass, or bronze it is preferable to use the lowest recommended speed.
- Pay special attention to maintaining an even feed rate; this prevents damage.
- **Additional versions on request.**
- **Further circular saw blades can be found in catalogue volume 2.**



17 9600



Pitch circle diameter of drive hole.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N						
17 9600/9700		850	650														450					●	●	○

Ø×bore	 17 9600		 17 9700		Thickness	Bore Ø	No. of teeth Z	Pitch t	Number of drive holes	Drive hole Ø	Drive hole pitch circle	suitable for saw makes
	Carbide-tipped circular saw blade											
mm	Rake angle positive	Rake angle negative	mm	mm	mm	mm	mm	mm	mm	mm	mm	
250×32F	eShop	eShop	3.2	32	80	9.8	2	11	63	Kaltenbach		
250×32M	eShop	(eShop)	3.2	32	60	13.1	2	11	63	Kaltenbach		
250×32G	eShop	—	3.2	32	40	19.6	2	11	63	Kaltenbach		
250×40M	(eShop)	—	3.2	40	60	13.1	2,4	8;12	55; 64	Eisele; Trennjäger; Ulmia		
275×40M	eShop	—	3.2	40	72	12.3	2,4	8;12	55;64	Eisele		
300×30F	eShop	eShop	3.2	30	96	9.8	2,2	7;11	42;63	Kaltenbach		
300×30M	eShop	eShop	3.2	30	72	13.1	2,2	7;11	42;63	Kaltenbach		
300×30G	eShop	—	3.2	30	48	18.1	2,2	7;11	42;63	Kaltenbach		
350×40F	eShop	(eShop)	3.4	40	108	10	2,4	8;12	55; 64	Eisele		
350×40M	eShop	eShop	3.4	40	84	13.1	2,4	8;12	55; 64	Eisele		
370×50F	(eShop)	—	3.6	50	120	9.7	4	15	80	Kaltenbach		
370×50M	eShop	—	3.6	50	96	12.1	4	15	80	Kaltenbach		
400×30M	(eShop)	—	4	30	96	13.1	2	11	63	Kaltenbach		
400×30G	(eShop)	—	4	30	72	18.5	2	11	63	Kaltenbach		

Reducing ring for circular saw blades with bore 40 mm

External and internal Ø each H7 fit, **thickness 3 mm.**

Application: For circular saw blades No. 177000 - 177540 with 40 mm bore diameter, for use in machines with 32 mm arbor.



17 9710

17B 17 9710

Reducing ring 40 / 32 for circular saw blades

eShop

Solid
carbide**Re-Bo Solid carbide circular saw blades**

Top quality German product with **precision toothing** and **hollow ground mirror finish sides**. Compared to HSS saw blades, the cutting speed can be increased by a factor of 3 to 4.

17 9800 – **DIN 1837 A fine-toothed** with **raked teeth to form A** with chisel edge.

For thin-walled components and small cutting depths.

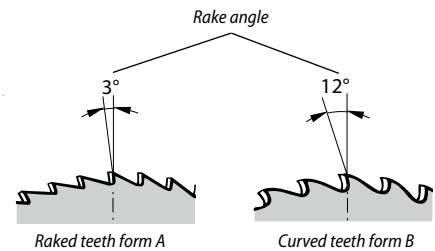
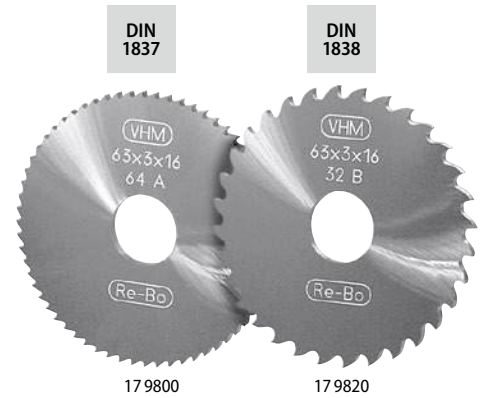
17 9820 – **DIN 1838 B coarse-toothed** with **curved teeth to form B** with chisel edge.

For cutting larger cross sections and greater cutting depths.

These blades are suitable for more universal use due to the improved chip formation and larger gullets compared to the fine-toothed version.

Note:

- Stable conditions of machine and component clamping are important prerequisites. If these conditions are disregarded the circular saw blade may break.
- The values for radial run-out and axial run-out are considerably better than the values specified in DIN 1840.
- Special sizes on request.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	500 N	750 N	900 N	1100 N	1400 N	55 HRC	60 HRC	65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
17 9800/9820		1200	700	200	140	140	90	40				110	100	90	125	400	600	○		●	●	●	●

Ø×thick- ness	17C	17C	Thickness	Bore Ø	No. of teeth Z		Ø×thick- ness	17C	17C	Thickness	Bore Ø	No. of teeth Z	
	17 9800	17 9820						17 9800	17 9820				
	Solid carbide circular saw blade							Solid carbide circular saw blade					
	DIN 1837 A fine	DIN 1838 B coarse			17 9800	17 9820		DIN 1837 A fine	DIN 1838 B coarse			17 9800	17 9820
mm			mm	mm			mm			mm	mm		
20×0,25	(eShop)	(eShop)	0.25	5	64	32	50×1	eShop	eShop	1	13	80	40
20×0,3	eShop	(eShop)	0.3	5	64	32	50×1,2	eShop	eShop	1.2	13	80	40
20×0,5	eShop	eShop	0.5	5	50	24	50×1,6	eShop	eShop	1.6	13	64	32
20×0,6	(eShop)	(eShop)	0.6	5	50	24	50×2	eShop	eShop	2	13	64	32
20×1	eShop	eShop	1	5	40	20	50×3	eShop	(eShop)	3	13	50	24
20×1,6	(eShop)	(eShop)	1.6	5	40	20	63×0,3	(eShop)	(eShop)	0.3	16	128	64
25×0,3	(eShop)	(eShop)	0.3	8	80	40	63×0,5	eShop	eShop	0.5	16	128	64
25×0,5	eShop	eShop	0.5	8	64	32	63×0,6	(eShop)	(eShop)	0.6	16	100	50
25×0,6	(eShop)	(eShop)	0.6	8	64	32	63×0,8	(eShop)	(eShop)	0.8	16	100	50
25×0,8	(eShop)	(eShop)	0.8	8	50	24	63×1	eShop	eShop	1	16	100	50
25×1	eShop	eShop	1	8	50	24	63×1,2	eShop	eShop	1.2	16	80	40
25×1,2	(eShop)	(eShop)	1.2	8	50	24	63×1,6	eShop	eShop	1.6	16	80	40
25×1,6	(eShop)	(eShop)	1.6	8	40	20	63×2	eShop	eShop	2	16	80	40
25×2	eShop	eShop	2	8	40	20	63×2,5	eShop	eShop	2.5	16	64	32
30×0,25	(eShop)	(eShop)	0.25	8	80	40	63×3	eShop	eShop	3	16	64	32
30×0,3	(eShop)	(eShop)	0.3	8	80	40	80×0,5	eShop	eShop	0.5	22	128	64
30×0,4	eShop	(eShop)	0.4	8	80	40	80×0,6	(eShop)	(eShop)	0.6	22	128	64
30×0,5	eShop	eShop	0.5	8	80	40	80×0,8	(eShop)	(eShop)	0.8	22	128	64
30×0,6	(eShop)	(eShop)	0.6	8	64	32	80×1	eShop	eShop	1	22	100	50
30×0,8	eShop	eShop	0.8	8	64	32	80×1,2	(eShop)	(eShop)	1.2	22	100	50
30×1	eShop	eShop	1	8	64	32	80×1,6	eShop	eShop	1.6	22	100	50
30×1,2	(eShop)	(eShop)	1.2	8	50	24	80×2	eShop	eShop	2	22	80	40
30×1,6	eShop	eShop	1.6	8	50	24	80×2,5	(eShop)	eShop	2.5	22	80	40
30×2	eShop	eShop	2	8	50	24	80×3	(eShop)	eShop	3	22	80	40
30×2,5	(eShop)	(eShop)	2.5	8	40	20	100×0,6	(eShop)	(eShop)	0.6	22	128	64
40×0,4	eShop	eShop	0.4	10	100	50	100×0,8	(eShop)	(eShop)	0.8	22	128	64
40×0,5	eShop	eShop	0.5	10	80	40	100×1	eShop	eShop	1	22	128	64
40×0,6	eShop	eShop	0.6	10	80	40	100×1,2	eShop	(eShop)	1.2	22	128	64
40×0,8	(eShop)	(eShop)	0.8	10	80	40	100×1,6	eShop	eShop	1.6	22	100	50
40×1	eShop	eShop	1	10	64	32	100×2	eShop	eShop	2	22	100	50
40×1,2	(eShop)	(eShop)	1.2	10	64	32	100×3	eShop	eShop	3	22	80	40
40×1,6	eShop	eShop	1.6	10	64	32	125×0,8	(eShop)	(eShop)	0.8	22	160	80
40×2	eShop	eShop	2	10	50	24	125×1	eShop	(eShop)	1	22	160	80
40×2,5	(eShop)	(eShop)	2.5	10	50	24	125×1,2	eShop	(eShop)	1.2	22	128	64
40×3	eShop	eShop	3	10	50	24	125×2	(eShop)	eShop	2	22	128	64
50×0,5	eShop	eShop	0.5	13	100	50	125×2,5	(eShop)	(eShop)	2.5	22	100	50
50×0,6	(eShop)	(eShop)	0.6	13	100	50	125×3	(eShop)	(eShop)	3	22	100	50
50×0,8	(eShop)	(eShop)	0.8	13	80	40							



Garant Adapter for saw system

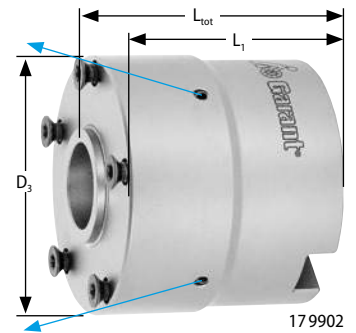
Ni-coated for improved wear resistance.

Application: Together with circular saw blades for sawing system. For slitting and parting off milling.

Note:

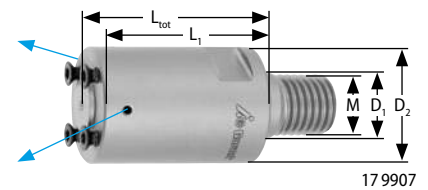
17 9902 – Mounting bore $\varnothing$ = interface to arbor.

17 9907 – Arbor for saw blade adapter with thread see catalogue machining and clamping technology section 3. **Successor product to No. 179905.**



17 9902

for saw blade $\varnothing$	210	17 9902	L_1	L_{tot}	$\varnothing D_3$	Mounting bore $\varnothing$	Number of attachment holes	Pitch circle of attachment holes	Set of insert screws
		Saw blade adapter							
mm		with bore	mm	mm	mm	mm		mm	
125		eShop	43	45	38	16	5	31.5	219985 (TX15; 4.2 Nm)
160		eShop	43	45	50	22	5	43.5	219985 (TX15; 4.2 Nm)



17 9907

for saw blade $\varnothing$	210	17 9907	L_1	L_{tot}	$\varnothing D_1$ h6	$\varnothing D_2$	Mounting thread M	Number of attachment holes	Pitch circle of attachment holes	Set of insert screws
		Saw blade adapter								
mm		with thread	mm	mm	mm	mm			mm	
40/50		eShop	35	36.8	12.5	24	M12	3	17.5	219985 (TX15; 4.2 Nm)
63/80/100		eShop	40	41.8	17	32	M16	4	25.5	219985 (TX15; 4.2 Nm)

Garant Circular saw blades for saw system

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si											INOX	INOX	Ti	CuZn	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N							
17 9912	400	600	300	50	40									20	15		300	○		●			○	
17 9915		800	400	180	130	120	85	35						90	70		200	○		●			○	
17 9925		300	150																	●			○	
17 9930				150	125	110	80													●			○	

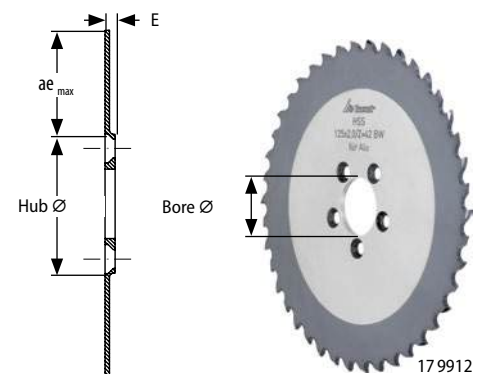
HSS

ae/D	12 %	8 %	5 %
fz factor	1.0	1.15	1.25

Optimised geometry and coating. Extra deep relief ground for reliable chip evacuation.
For flat base of the slot.

Note:

- Tooth profile BW.
- The tolerances for the circular saw blade diameter are considerably better than the values permissible to DIN 1837/1838, in some cases by up to 50%.



17 9912

$\varnothing \times$ thickness	17C	17 9912	Thickness	Collar thickness E	$a_{e \max}$	Hub $\varnothing$	Bore $\varnothing$	No. of teeth Z	Number of drive holes	Drive hole $\varnothing$	Drive hole pitch circle	suitable adapter	Alu 	f_z
		Circular saw blade												
mm		TiAlN	mm	mm	mm	mm	mm			mm	mm			mm
63×2		eShop	2	2.5	14	32	16	24	4	4.4	25.5	179907 63; 80; 100		0.01
80×2		eShop	2	2.5	22	32	16	30	4	4.4	25.5	179907 63; 80; 100		0.01
100×2		eShop	2	2.5	32	32	16	34	4	4.4	25.5	179907 63; 80; 100		0.02
125×2		eShop	2	2.5	40	38	22	42	5	4.4	31.5	179902 125		0.02
160×2		eShop	2	2.5	51	50	22	54	5	4.4	43.5	179902 160		0.02

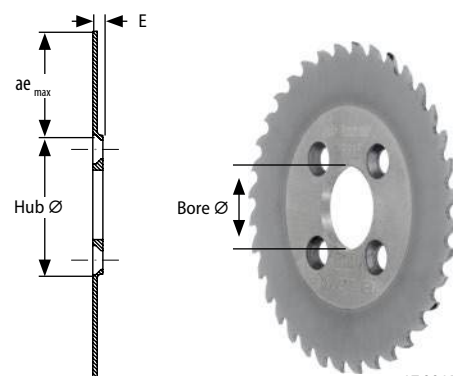
Solid
carbide

GARANT solid carbide circular saw blade with extra narrow cutting width in order to minimise the loss of material. The cutting speed can be **increased by a factor of 3 to 4** compared to HSS saw blades. Reinforced collar for a significant increase in the stability of the saw blade. For flat base of the slot.

Note: The tolerances for the circular saw blade diameter are considerably better than the values permissible to DIN 1837/1838, in some cases by up to 50%.

Size 40×1 – Tooth profile B.

Size 50×1–125×2 – Tooth profile BW.



17 9915

Ø×thickness	17C	17 9915	Thick- ness	Collar thick- ness E	a _{e max}	Hub Ø	Bore Ø	No. of teeth Z	Number of drive holes	Drive hole Ø	Drive hole pitch circle	suitable adapter	 f _z
		Circular saw blade											
mm		TiAIN	mm	mm	mm	mm	mm			mm	mm		mm
40×1		eShop	1	2.4	6	24	8	28	3	4.4	17.5	179907 40; 50	0.015
50×1		eShop	1	2.4	11	24	8	32	3	4.4	17.5	179907 40; 50	0.015
50×2		eShop	2	2.4	11	24	8	28	3	4.4	17.5	179907 40; 50	0.02
63×1		eShop	1	2.4	14	32	16	32	4	4.4	25.5	179907 63; 80; 100	0.015
63×1,5		eShop	1.5	2.4	14	32	16	28	4	4.4	25.5	179907 63; 80; 100	0.02
63×2		eShop	2	2.4	14	32	16	26	4	4.4	25.5	179907 63; 80; 100	0.025
80×1,2		eShop	1.2	2.4	22	32	16	44	4	4.4	25.5	179907 63; 80; 100	0.015
80×1,5		eShop	1.5	2.4	22	32	16	36	4	4.4	25.5	179907 63; 80; 100	0.02
80×2		eShop	2	2.4	22	32	16	34	4	4.4	25.5	179907 63; 80; 100	0.025
100×1,5		eShop	1.5	2.4	28	38	22	44	5	4.4	31.5	179902 125	0.02
100×2		eShop	2	2.4	28	38	22	42	5	4.4	31.5	179902 125	0.025
125×2		eShop	2	2.4	36	50	22	50	5	4.4	43.5	179902 160	0.025

Carbide



GARANT carbide-tipped circular saw blade for extra deep saw cuts. Unequal spacing of the saw blade teeth for smooth cutting. We recommend radial feed to minimise vibration and increase the working life of the saw blade.

17 9925 – Carbide substrate. Tooth form and number of teeth specially configured for machining aluminium.

17 9930 – Carbide substrate. Tooth form and number of teeth specially configured for machining steel. Very well suited even for steel < 1100 N/mm².



17 9925



17 9930

Ø×thickness	17C	17 9925	17C	17 9930	Thick- ness	a _{e max}	Bore Ø	No. of teeth Z	Number of drive holes	Drive hole Ø	Drive hole pitch circle	suitable adapter	 f _z	 f _z
		Circular saw blade												
		uncoated		uncoated				17 9925	17 9930					
mm					mm	mm	mm			mm	mm		mm	mm
100×3		eShop		eShop	3	32	16	16	26	4	4.4	25.5	179907 63; 80; 100	0.02
125×3		eShop		eShop	3	42	22	16	26	5	4.4	31.5	179902 125	0.025
160×3		eShop		eShop	3	52	22	20	28	5	4.4	43.5	179902 160	0.03

Garant Disposable saw blades

On request we can also supply **disposable saw blades** (carbide-tipped and/or coated) in the following versions:

250 × 2.0 × 1.75 × 32 × 60 Z	285 × 2.0 × 1.75 × 32 × 80 Z
250 × 2.0 × 1.75 × 32 × 80 Z	360 × 2.6 × 2.25 × 40 × 60 Z
285 × 2.0 × 1.75 × 32 × 60 Z	360 × 2.6 × 2.25 × 40 × 100 Z

Saw blades tipped with Cermet are also available on request.

HSS
Co5DIN
841

js16



Garant Shell end mills

The end mills cut on the front face and on the circumference.

Application:

18 1000 – **Type N** = standard toothing, 30° helix.

18 1100 – **Type H** = fine toothing, 20° helix.

Note:

Sizes 30×30, 35×35, 40×20, 50×25, 60×60 can only be mounted using a bore keyway.
 f_z for $a_e = 0.5 - 1 \times D$.

Ø	30	35	40	50	60	75	90
a_p	$0.1 \times D$	$0.09 \times D$	$0.08 \times D$	$0.06 \times D$	$0.05 \times D$	$0.04 \times D$	$0.03 \times D$

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
18 1000				30	28	25								20	18		45	○		●			
18 1100					28	25	22									20	45	●		●			

Ø×width js16	18 1000	18 1100	Bore Ø H7	No. of teeth Z	
	Shell end mill			18 1000	18 1100
mm	N	H	mm		mm
30×30	eShop	(eShop)	13	6	10
35×35	eShop	eShop	16	6	10
40×20	eShop	eShop	16	6	10
40×40	eShop	eShop	16	6	10
50×25	eShop	(eShop)	22	8	12

Ø×width js16	18 1000	18 1100	Bore Ø H7	No. of teeth Z	
	Shell end mill			18 1000	18 1100
mm	N	H	mm		mm
50×50	eShop	eShop	22	8	12
60×30	eShop	eShop	27	8	12
60×60	eShop	eShop	27	8	12
75×35	eShop	–	27	10	–
90×35	(eShop)	(eShop)	27	10	16

HSS
Co5DIN
1880T1

js16



Garant Shell end mills

The end mills cut on the front face and on the circumference.

Application:

18 1500 – **Type N** = standard toothing, 30° helix.

18 1700 – **Type W** = coarse toothing, 40° helix.

Note:

f_z for $a_e = 0.5 - 1 \times D$.

Ø	40	50	63	80	100
a_p	$0.08 \times D$	$0.06 \times D$	$0.05 \times D$	$0.04 \times D$	$0.03 \times D$

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
18 1500				30	28	25								20	18			○		●			
18 1700	200	150		30															●				

Ø×width js16	18 1500	18 1700	Bore Ø H7	No. of teeth Z	
	Shell end mill			18 1500	18 1700
mm	N	W	mm		mm
40×32	eShop	eShop	16	6	3
50×36	eShop	eShop	22	8	3
63×40	eShop	eShop	27	8	4

Ø×width js16	18 1500	18 1700	Bore Ø H7	No. of teeth Z	
	Shell end mill			18 1500	18 1700
mm	N	W	mm		mm
80×45	eShop	eShop	27	10	4
100×50	eShop	–	32	12	–

Type
N

18 1500

Type
W

18 1700

HSS
Co5DIN
1880T1

js16



Garant Roughing / semi-roughing shell end mill

Relief ground profile. Wide lands permit frequent regrinding without losing the profile.

Note: f_z for $a_e = 0.5 - 1 \times D$.

Ø	40	50	60	63	80	100
a_p	$0.08 \times D$	$0.06 \times D$	$0.05 \times D$	$0.05 \times D$	$0.04 \times D$	$0.03 \times D$



18 2200



18 2500

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 											INOX 	INOX 	Ti 	CuZn 	Uni 					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	N						
18 2200/2500				30	28	25							20	18		45	●	●				

Ø × width js16	18 2200	18 2500	Bore Ø H7	No. of teeth Z	
	Roughing shell end mill	Semi-roughing shell end mill			
mm	NR	NF	mm		f_z mm
40 × 32	eShop	eShop	16	6	0.07
50 × 36	eShop	eShop	22	6	0.07
50 × 50	—	eShop	22	6	0.07
60 × 30	—	eShop	27	8	0.07
63 × 40	eShop	eShop	27	8	0.07
80 × 45	eShop	eShop	27	8	0.07
100 × 50	eShop	(eShop)	32	10	0.07

HSS
Co5DIN
1880T1

js16



Garant Roughing shell end mill

Eccentric relief ground fine knuckle-type profile.
Optimum cutting edge geometry.

Note: f_z for $a_e = 0.5 - 1 \times D$.

Ø	40	50	60	80	100
a_p	$0.08 \times D$	$0.06 \times D$	$0.05 \times D$	$0.04 \times D$	$0.03 \times D$



18 2750

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	Alu cast > 10 % Si 											INOX 	INOX 	Ti 	CuZn 	Uni 						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N							
18 2750				45	42	38	33							25	20	15	60	●	●					

Ø × width js16	18 2750	Bore Ø H7	No. of teeth Z	
	Roughing shell end mill			
mm	HR TiAlN	mm		f_z mm
40 × 32	eShop	16	8	0.07
50 × 36	eShop	22	8	0.07
63 × 40	eShop	27	10	0.07
80 × 45	eShop	27	10	0.07
100 × 50	eShop	32	12	0.07

SIMTEK**simmillQX**
SIMTEK milling tools type QX

SOLID CARBIDE SIDE MILLING CUTTER. SHARP TEETH FOR EFFICIENT SLOT MILLING.

High-performance side milling cutter
made of solid carbide for slot milling.

We would be pleased to
advise you!
Custom solutions on request.

In eight different
cutting widths.

Tool diameter of
50 mm and 63 mm.

Each version available as sharp-edged
or with a corner radius of 0.2.

Coatings

X700 for applications in P and K materials.
X500 for applications in M, N and S materials.

Note

Following an update to the range, the
SIMTEK
solid carbide side milling cutter replaces
the GARANT side milling cutter 18 5015.

Suitable GARANT toolholders:



300835_13/_16

302895_13/_16

306110_13/_16



18

HSS
Co5DIN
885 AType
N

js16

Garant Side milling cutter

Staggered teeth with collar and keyway.

Application: For **slotting or cutting-off** when the side faces of the component must have an accurate and clean surface.**Note:** f_z for $a_e = 0.1 \times D$.

18 5820

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
18 5820		200		19	19	19	19	19	19	H	H	H	H	9	9	9	180	180	○	●			

$\varnothing \times \text{width}$ js16 × k11	18 5820	Bore $\varnothing$ H7	No. of teeth Z	
mm	Side milling cutter	mm		f_z mm
50×3	eShop	16	14	0.04
50×4	eShop	16	14	0.04
50×5	eShop	16	14	0.04
50×6	eShop	16	14	0.04
50×8	eShop	16	14	0.04
50×10	eShop	16	14	0.04
63×3	eShop	22	16	0.05
63×4	eShop	22	16	0.05
63×5	eShop	22	16	0.05
63×6	eShop	22	16	0.05
63×8	eShop	22	14	0.05
63×10	eShop	22	14	0.05
63×12	eShop	22	14	0.05
80×3	eShop	27	18	0.06
80×4	eShop	27	18	0.06
80×5	eShop	27	18	0.06
80×6	eShop	27	18	0.06
80×8	eShop	27	16	0.06
80×10	eShop	27	16	0.06
80×12	eShop	27	16	0.06
100×3	eShop	32	22	0.06
100×4	eShop	32	22	0.06
100×5	eShop	32	22	0.06
100×6	eShop	32	22	0.06
100×8	eShop	32	18	0.06
100×10	eShop	32	18	0.06
100×12	eShop	32	18	0.06
125×4	eShop	32	24	0.09
125×5	eShop	32	24	0.09
125×6	eShop	32	24	0.09
125×8	eShop	32	20	0.09
125×10	eShop	32	20	0.09
125×12	eShop	32	20	0.09
160×6	eShop	40	26	0.11
160×8	eShop	40	26	0.11
160×10	eShop	40	22	0.11
160×12	eShop	40	22	0.11
160×14	eShop	40	22	0.11



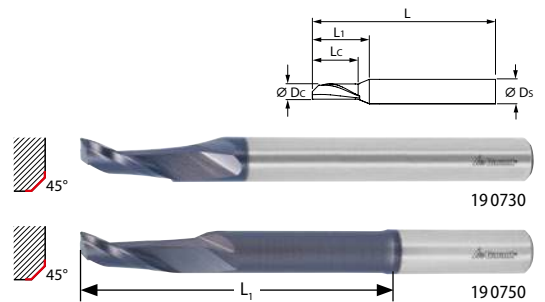
Garant Slot drill for ELU machines

Special cutting edge geometry for aluminium and plastics.
Frontal and peripheral cutting with only one cutting edge.

19 0750 – With **neck recess**.

Size 5×100 special water drainage slot drill.

Application: For milling slots on doors and windows of aluminium or plastic using high speed special milling machines (Elu, Haffner etc.).



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
19 0730/0750	200	120	100	78													90						

Ø×Length js14 D _c	19 0730	19 0750	L _c	L ₁	L	Ø D _s	Corner chamfer width at 45°
	Slot drill						
				19 0750			
mm	TiAIN	TiAIN	mm	mm	mm	mm	mm
3×60	eShop	—	12	—	60	8	0.13
4×60	eShop	—	12	—	60	8	0.13
5×60	eShop	—	14	—	60	8	0.13
5×80	—	eShop	18	35	80	8	0.13
5×100	—	eShop	40	—	100	8	0.13

Ø×Length js14 D _c	19 0730	19 0750	L _c	L ₁	L	Ø D _s	Corner chamfer width at 45°
	Slot drill						
				19 0750			
mm	TiAIN	TiAIN	mm	mm	mm	mm	mm
6×60	eShop	—	16	—	60	8	0.13
8×80	eShop	eShop	14	54	80	8	0.23
8×120	eShop	—	14	—	120	8	0.23
10×80	eShop	—	14	—	80	8	0.13



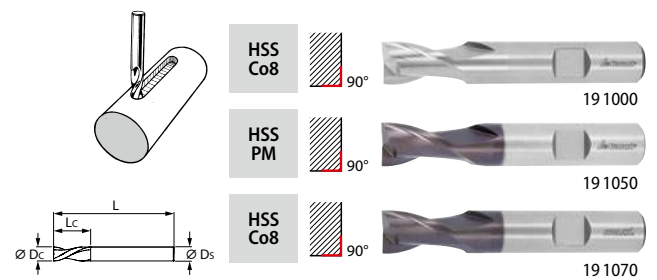
Slot drill (keyway cutter)

Centre cutting edge geometry for plunging.

19 1050 – For very high demands on the metal removal rate.

19 1070 – Economy version.

Application: For milling **keyways** (slots) or pockets from the centre of the component.



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 1000	83	37	28	23	23											23	55	●					
19 1050	138	110	83	64	64	37	32									23	18	55	110	●			
19 1070			78	55	55											17	14	46	92	●			

Ø e8 D _c	19 1000	19 1050	19 1070	L _c	L	Ø D _s	f _z
	Garant		HOLEX				
	Slot drill						
	HSS-Co8	HSS-PM TiAIN	HSS-Co8 TiAIN				
mm				mm	mm	mm	mm
1	eShop	—	—	2,5	47	6	0.005
1,5	eShop	—	—	3	47	6	0.005
2	eShop	eShop	eShop	4	48	6	0.006
2,5	eShop	eShop	eShop	5	49	6	0.006
2,8	eShop	eShop	eShop	5	49	6	0.006
3	eShop	eShop	eShop	5	49	6	0.007
3,5	eShop	eShop	eShop	6	50	6	0.007
3,8	eShop	eShop	eShop	7	51	6	0.007
4	eShop	eShop	eShop	7	51	6	0.009
4,5	eShop	eShop	eShop	7	51	6	0.009
4,8	eShop	eShop	eShop	8	52	6	0.009
5	eShop	eShop	eShop	8	52	6	0.012
5,5	eShop	eShop	eShop	8	52	6	0.012
5,75	eShop	eShop	eShop	8	52	6	0.012
6	eShop	eShop	eShop	8	52	6	0.014
6,5	eShop	eShop	eShop	10	60	10	0.014
6,75	eShop	—	—	10	60	10	0.014
7	eShop	eShop	eShop	10	60	10	0.016
7,5	eShop	eShop	eShop	10	60	10	0.016
7,75	eShop	eShop	eShop	11	61	10	0.016
8	eShop	eShop	eShop	11	61	10	0.02
8,5	eShop	eShop	eShop	11	61	10	0.02
8,7	eShop	—	—	11	61	10	0.02
9	eShop	eShop	eShop	11	61	10	0.024
9,5	eShop	—	—	11	61	10	0.024
9,7	eShop	eShop	eShop	13	63	10	0.024
10	eShop	eShop	eShop	13	63	10	0.03
10,5	eShop	eShop	eShop	13	63	12	0.03

Ø e8 D _c	19 1000	19 1050	19 1070	L _c	L	Ø D _s	f _z
	Garant		HOLEX				
	Slot drill						
	HSS-Co8	HSS-PM TiAIN	HSS-Co8 TiAIN				
mm				mm	mm	mm	mm
11	eShop	eShop	eShop	13	70	12	0.032
11,7	eShop	—	eShop	13	70	12	0.032
12	eShop	eShop	eShop	16	73	12	0.035
12,7	eShop	—	—	16	73	12	0.035
13	eShop	eShop	eShop	16	73	12	0.038
13,7	eShop	—	—	16	73	12	0.038
14	eShop	eShop	eShop	16	73	12	0.042
14,5	eShop	—	—	16	73	12	0.042
15	eShop	eShop	eShop	16	73	12	0.045
15,7	eShop	—	—	19	79	16	0.045
16	eShop	eShop	eShop	19	79	16	0.048
16,5	eShop	—	—	19	79	16	0.048
17	eShop	eShop	eShop	19	79	16	0.051
17,7	eShop	—	—	19	79	16	0.051
18	eShop	eShop	eShop	19	79	16	0.054
19	eShop	—	—	19	79	20	0.057
19,7	eShop	—	—	22	88	20	0.057
20	eShop	eShop	eShop	22	88	20	0.06
21,7	eShop	—	—	22	88	20	0.062
22	eShop	—	—	22	88	20	0.062
24	eShop	—	—	26	102	25	0.065
25	eShop	—	—	26	102	25	0.065
26	eShop	—	—	26	102	25	0.065
28	eShop	—	—	26	102	25	0.068
30	eShop	—	—	26	102	25	0.068
32	eShop	—	—	32	112	32	0.068
36	eShop	—	—	32	112	32	0.072
40	eShop	—	—	38	130	32	0.072

HSS Co8	DIN 844 B	Type N	e8	2	30°	h6 DIN 1835 B
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Garant Slot drill (keyway cutter)

Dimensions to **DIN 844 long**.

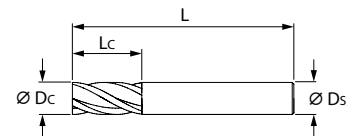
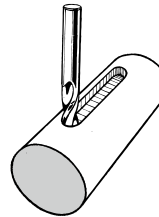
Cutting length to **DIN 844 short**.

Centre cutting edge geometry for plunging.

Application: For milling **keyways** (slots) or pockets from the centre of the component.



19 1080



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N					
19 1080	83			28	25	23										23	55					

Ø e8 D _c	19 1080	L _c	L	Ø D _s	f _z
mm	Slot drill	mm	mm	mm	mm
2	eShop	7	54	6	0.006
2,5	eShop	8	56	6	0.006
3	eShop	8	56	6	0.007
3,5	eShop	10	59	6	0.007
4	eShop	11	63	6	0.008
4,5	eShop	11	63	6	0.008
5	eShop	13	68	6	0.01
5,5	eShop	13	68	6	0.01
6	eShop	13	68	6	0.012
6,5	eShop	16	80	10	0.012
7	eShop	16	80	10	0.016
7,5	eShop	16	80	10	0.016
8	eShop	19	88	10	0.018
8,5	eShop	19	88	10	0.018
9	eShop	19	88	10	0.022
9,5	eShop	19	88	10	0.022
10	eShop	22	95	10	0.028
11	eShop	22	102	12	0.028
12	eShop	26	110	12	0.034
13	eShop	26	110	12	0.036
14	eShop	26	110	12	0.038
15	eShop	26	110	12	0.042
16	eShop	32	123	16	0.042
17	eShop	32	123	16	0.046
18	eShop	32	123	16	0.046
19	eShop	38	141	20	0.05
20	eShop	38	141	20	0.054
22	eShop	38	141	20	0.054
30	eShop	45	166	25	0.06



Garant Slot drills

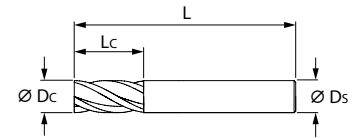
Centre cutting teeth for plunging.

Eccentric relief ground.

19 1290 – For the most demanding metal removal rates.

Note:

Suitable for use as a slot drill (tolerance e8) **or an end mill.**
50 % higher metal removal rate than 2 flute slot drills.
Larger flutes than multi-flute end mills (good for soft material).
 For milling keyways.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 1280		83		28	25	23										23	55						
19 1290		138	110	83	64	64	37	32						23	18	55	110						

$\varnothing e8$ D_c	19 1280	19 1290	L_c	L	$\varnothing D_s$	f_z
	Slot drills					
	HSS-Co8	HSS-PM TiAlN				
mm			mm	mm	mm	mm
3	eShop	eShop	12	56	6	0.003
3,5	eShop	—	15	59	6	0.005
4	eShop	eShop	19	63	6	0.005
4,5	eShop	—	19	63	6	0.005
5	eShop	eShop	24	68	6	0.008
5,5	eShop	—	24	68	6	0.008
6	eShop	eShop	24	68	6	0.011
8	eShop	eShop	38	88	10	0.015
10	eShop	eShop	45	95	10	0.018

$\varnothing e8$ D_c	19 1280	19 1290	L_c	L	$\varnothing D_s$	f_z
	Slot drills					
	HSS-Co8	HSS-PM TiAlN				
mm			mm	mm	mm	mm
12	eShop	eShop	53	110	12	0.024
14	eShop	eShop	53	110	12	0.024
16	eShop	eShop	63	123	16	0.03
18	eShop	—	63	123	16	0.033
20	eShop	eShop	75	141	20	0.04
22	eShop	—	75	141	20	0.04
25	eShop	—	90	166	25	0.045
30	eShop	—	90	166	25	0.05



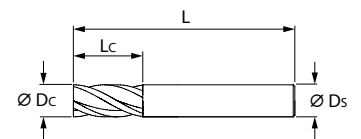
Garant Slot drills

Centre cutting teeth for plunging.

Eccentric relief ground.

- Wide, precision ground chip flutes.
- Extremely fine workpiece surfaces due to precisely ground cutting edges.
- Special rake angle for aluminium.

Note: For milling keyways.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
19 1320/1340		150	37	28																			

$\varnothing e8$ D_c	19 1320	19 1340	L_c	L	$\varnothing D_s$	f_z
	Slot drills					
			19 1320	19 1340	19 1320	19 1340
mm			mm	mm	mm	mm
3	eShop	—	8	—	52	—
4	eShop	—	11	—	55	—
5	eShop	—	13	—	57	—
6	eShop	eShop	13	24	57	68
7	eShop	—	16	—	66	—
8	eShop	eShop	19	38	69	88
9	eShop	—	19	—	69	—
10	eShop	eShop	22	45	72	95
11	eShop	—	22	—	79	—

$\varnothing e8$ D_c	19 1320	19 1340	L_c	L	$\varnothing D_s$	f_z
	Slot drills					
			19 1320	19 1340	19 1320	19 1340
mm			mm	mm	mm	mm
12	eShop	eShop	26	53	83	110
14	eShop	eShop	26	53	83	110
15	eShop	—	26	—	83	—
16	eShop	eShop	32	63	92	123
20	eShop	eShop	38	75	104	141
22	eShop	eShop	38	75	104	141
25	eShop	eShop	45	90	121	166
30	eShop	eShop	45	90	121	166

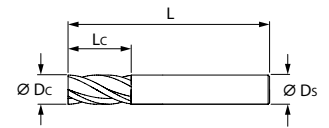


HOLEX Mini milling cutter

Centre cutting teeth for plunging.

Eccentric relief ground. Shank similar to DIN 1835 B with shank tolerance h6. General-purpose cutting edge geometry. For use as **slot drill or end mill** in side lock arbors and collet chucks. **High cutting performance**, very competitive price. For milling keyways.

191380 – For the most demanding metal removal rates.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
191360		83		30	25	25											55						
191380		138	110	83	64	64	37	32						23	18		110						

Ø e8 D _c	12W 191360	12W 191380	L _c	L	Ø D _s	f _z
mm	HSS-Co8	HSS-PM TiAlN	mm	mm	mm	mm
1	eShop	—	3	34	6	0.002
1,5	eShop	eShop	3	34	6	0.002
1,8	eShop	—	3	34	6	0.002
2	eShop	eShop	4	35	6	0.003
2,3	eShop	—	4	36	6	0.003
2,5	eShop	eShop	5	36	6	0.003
2,8	eShop	eShop	5	36	6	0.003
3	eShop	eShop	5	36	6	0.003
3,3	eShop	—	5	36	6	0.003
3,5	eShop	eShop	6	37	6	0.003
3,8	eShop	eShop	7	38	6	0.003
4	eShop	eShop	7	38	6	0.005
4,3	eShop	—	7	38	6	0.005
4,5	eShop	eShop	7	38	6	0.005
4,8	eShop	eShop	8	39	6	0.005

Ø e8 D _c	12W 191360	12W 191380	L _c	L	Ø D _s	f _z
mm	HSS-Co8	HSS-PM TiAlN	mm	mm	mm	mm
5	eShop	eShop	8	39	6	0.008
5,5	eShop	eShop	8	39	6	0.008
5,75	eShop	eShop	8	39	6	0.008
6	eShop	eShop	8	39	6	0.011
6,5	—	eShop	10	42	8	0.011
7	eShop	eShop	10	42	8	0.014
7,5	eShop	eShop	10	42	8	0.014
8	eShop	eShop	11	43	8	0.018
9	—	eShop	11	48	10	0.018
9,5	—	eShop	11	48	10	0.018
10	eShop	eShop	13	50	10	0.025
12	eShop	eShop	16	58	12	0.04
16	eShop	eShop	19	64	16	0.05
20	eShop	eShop	22	78	20	0.06

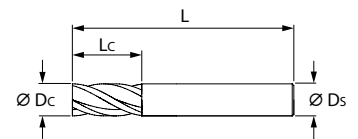


HOLEX Mini milling cutter

Centre cutting teeth for plunging.

Eccentric relief ground. General-purpose cutting edge geometry. Shank similar to DIN 1835 B with shank tolerance h6. For use as **slot drill or end mill** in side lock arbors and collet chucks. **High cutting performance**, very competitive price. For milling keyways.

191420 – For the most demanding metal removal rates.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
191400		83		30	25	25											55						
191420		138	110	83	64	64	37	32						23	18		110						

Ø e8 D _c	12W 191400	12W 191420	L _c	L	Ø D _s	f _z
mm	HSS-Co8	HSS-PM TiAlN	mm	mm	mm	mm
2	eShop	eShop	7	38	6	0.003
2,5	eShop	eShop	8	39	6	0.003
3	eShop	eShop	8	39	6	0.003
3,5	eShop	eShop	10	41	6	0.003
4	eShop	eShop	11	42	6	0.005
4,5	eShop	eShop	11	42	6	0.005
5	eShop	eShop	13	44	6	0.008
5,5	eShop	eShop	13	44	6	0.008

Ø e8 D _c	12W 191400	12W 191420	L _c	L	Ø D _s	f _z
mm	HSS-Co8	HSS-PM TiAlN	mm	mm	mm	mm
6	eShop	eShop	13	44	6	0.01
6,5	—	eShop	16	48	8	0.01
7	eShop	eShop	16	48	8	0.012
7,5	—	eShop	16	48	8	0.012
8	eShop	eShop	19	51	8	0.016
8,5	—	eShop	19	56	10	0.016
9	eShop	eShop	19	56	10	0.018
10	eShop	eShop	22	59	10	0.024



End mill

Multi-flute end mill. **Eccentric relief ground.**

19 1500 – Centre cutting edge geometry for plunging.

19 1520 – For the highest demands in respect to material removal rates.

Excellent results when milling dry.

Size 6M–25M **MID mills:**

Dimensions to **manufacturer's standard**, which lies **between** DIN 844 **short** and DIN 844 **long**. **Particularly suitable** for **mould** and **tool making**, as the **medium length** provides higher **rigidity** than long series mills to DIN 844.

19 1590 – Economy version.



19 1500



19 1520



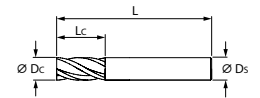
MID end mill 19 1520



19 1590

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast  > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni						
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N							
19 1500		83	30	25	25										23	55	●	●	●	●	●	●	
19 1520		138	110	83	64	64	37	32					23	18	55	110	●	●	●	●	●	●	
19 1590		120	78	55	55								17	14	46	92	●	●	●	●	●	●	

Ø k10 D _c	11W 19 1500	11W 19 1520	12W 19 1590	No. of teeth Z			L _c	L	Ø D _s	
mm	HSS-Co8	HSS-PM TiAlN	HSS-Co8 TiAlN	19 1500	19 1520	19 1590	mm	mm	mm	
2	eShop	—	—	4	—	—	7	51	6	0.003
2,5	eShop	—	—	4	—	—	8	52	6	0.003
3	eShop	eShop	eShop	4	4	4	8	52	6	0.005
3,5	eShop	—	—	4	—	—	10	54	6	0.005
4	eShop	eShop	eShop	4	4	4	11	55	6	0.008
4,5	eShop	—	—	4	—	—	11	55	6	0.008
5	eShop	eShop	eShop	4	4	4	13	57	6	0.01
5,5	eShop	—	—	4	—	—	13	57	6	0.01
6	eShop	eShop	eShop	4	4	4	13	57	6	0.014
6M	—	eShop	—	—	4	—	19	63	6	0.014
6,5	eShop	—	—	4	—	—	16	66	10	0.014
7	eShop	eShop	eShop	4	4	4	16	66	10	0.014
7,5	eShop	—	—	4	—	—	16	66	10	0.014
8	eShop	eShop	eShop	4	4	4	19	69	10	0.02
8M	—	eShop	—	—	4	—	28	78	10	0.02
8,5	eShop	—	—	4	—	—	19	69	10	0.02
9	eShop	eShop	eShop	4	4	4	19	69	10	0.02
10	eShop	eShop	eShop	4	4	4	22	72	10	0.023
10M	—	eShop	—	—	4	—	35	84	10	0.023
10,5	eShop	—	—	4	—	—	22	79	12	0.023
11	eShop	—	—	4	—	—	22	79	12	0.025
11,5	eShop	—	—	4	—	—	22	79	12	0.025
12	eShop	eShop	eShop	4	4	4	26	83	12	0.028
12M	—	eShop	—	—	4	—	40	97	12	0.028
13	eShop	eShop	eShop	4	4	4	26	83	12	0.028
14	eShop	eShop	eShop	4	4	4	26	83	12	0.028
15	eShop	eShop	eShop	4	4	4	26	83	12	0.028
16	eShop	eShop	eShop	4	6	4	32	92	16	0.034
16M	—	eShop	—	—	6	—	48	108	16	0.034
18	eShop	eShop	eShop	4	6	4	32	92	16	0.034
20	eShop	eShop	eShop	4	6	4	38	104	20	0.039
20M	—	eShop	—	—	6	—	58	122	20	0.039
22	eShop	eShop	eShop	4	6	4	38	104	20	0.042
24	eShop	—	—	4	—	—	45	121	25	0.042
25	eShop	eShop	eShop	4	6	6	45	121	25	0.046
25M	—	eShop	—	—	6	—	68	144	25	0.046
26	eShop	—	—	6	—	—	45	121	25	0.046
28	eShop	—	—	6	—	—	45	121	25	0.05
30	eShop	—	—	6	—	—	45	121	25	0.05
32	eShop	—	—	6	—	—	53	133	32	0.05
35	eShop	—	—	6	—	—	53	133	32	0.056
40	eShop	—	—	6	—	—	63	155	32	0.06



Garant Milling cutter

Multi-flute end mill. End face recessed.
Eccentric relief ground.

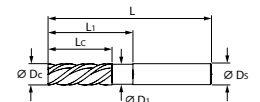


19 1530

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 1530	83	30	25	25	25	25	25	25	25	25	25	25	25	23	55								

$\varnothing$ k10 D_c	11W 19 1530	No. of teeth Z	L_c	L	$\varnothing$ D_s	f_z
mm	End mill		mm	mm	mm	mm
5	eShop	5	24	68	6	0.008
6	eShop	5	24	68	6	0.012
7	eShop	5	30	80	10	0.012
8	eShop	5	38	88	10	0.018
9	eShop	5	38	88	10	0.018
10	eShop	5	45	95	10	0.03
11	eShop	5	45	102	12	0.03
12	eShop	5	53	110	12	0.04
14	eShop	5	53	110	12	0.04

$\varnothing$ k10 D_c	11W 19 1530	No. of teeth Z	L_c	L	$\varnothing$ D_s	f_z
mm	End mill		mm	mm	mm	mm
16	eShop	6	63	123	16	0.045
18	eShop	6	63	123	16	0.045
20	eShop	6	75	141	20	0.048
22	eShop	6	75	141	20	0.048
25	eShop	6	90	166	25	0.05
30	eShop	7	90	166	25	0.055
32	eShop	7	106	186	32	0.055
40	eShop	7	125	217	32	0.06



Garant Milling cutter

Multi-flute end mill, for highest metal removal rate demands.
Centre cutting edge geometry for plunging. **Eccentric relief ground.**
For peripheral milling as a finishing operation, **producing very high surface finish quality.**
Advantage: Excellent results when milling dry.



19 1581

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 1581	138	110	83	64	64	37	32	32	32	32	32	32	32	23	18	55	110						

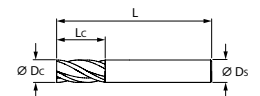
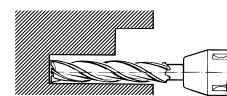
$\varnothing$ k10 D_c	11W 19 1581	L_c	L_1	$\varnothing$ D_1	L	$\varnothing$ D_s	Corner chamfer width at 45°	f_z
mm	End mill HSS-PM TiAlN	mm	mm	mm	mm	mm	mm	mm
6	eShop	13	21	5.7	57	6	0.2	0.016
8	eShop	19	—	—	69	10	0.2	0.024
10	eShop	22	32	9.7	72	10	0.2	0.038
12	eShop	26	38	11.5	83	12	0.25	0.058
14	eShop	26	—	—	83	12	0.25	0.058

$\varnothing$ k10 D_c	11W 19 1581	L_c	L_1	$\varnothing$ D_1	L	$\varnothing$ D_s	Corner chamfer width at 45°	f_z
mm	End mill HSS-PM TiAlN	mm	mm	mm	mm	mm	mm	mm
16	eShop	32	44	15.5	92	16	0.25	0.066
18	eShop	32	—	—	92	16	0.3	0.066
20	eShop	38	54	19.5	104	20	0.3	0.076
25	eShop	45	65	24	121	25	0.3	0.076



Garant Milling cutter

Multi-flute end mill. End face recessed.
Advantage: Particularly for machining at recessed or difficult to access places
or for milling deep opened ended pockets in one operation.



19 1620

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 1620	83	28	23	23	23	23	23	23	23	23	23	23	23	23	55								

$\varnothing$ k10 D_c	11W 19 1620	L_c	L	$\varnothing$ D_s	f_z
mm	End mill	mm	mm	mm	mm
6	eShop	56	100	6	0.01
8	eShop	63	106	10	0.02
10	eShop	70	112	10	0.03
12	eShop	75	125	12	0.035

$\varnothing$ k10 D_c	11W 19 1620	L_c	L	$\varnothing$ D_s	f_z
mm	End mill	mm	mm	mm	mm
14	eShop	75	125	12	0.038
16	eShop	85	140	16	0.04
18	eShop	100	160	16	0.04
20	eShop	110	180	20	0.045



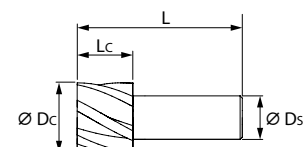
Garant Milling cutter

Multi-flute end mill. End face recessed.

Advantage: For milling at low cutting depths (predominantly face milling).
Very reliable cutter, due to low load on the machine spindle.



19 1630



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	Alu cast > 10 % Si 											INOX 	INOX 	GG(G) 	CuZn 	Uni 						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N							
19 1630	83		28	23	23											23	55							

Ø k10 D_c	11W	19 1630	No. of teeth Z	L_c	L	Ø D_s	f_z
mm		End mill		mm	mm	mm	mm
30		eShop	6	30	90	20	0.08
35		eShop	6	30	90	20	0.08
40		eShop	6	32	95	25	0.1
50		eShop	8	36	100	32	0.12



HOLEX Milling cutter set HPC

For roughing and finishing, multi-tooth with general purpose geometry.
 One each end mill No. 191637 Ø 6; 8; 10; 12 and 16 mm.

Supplied with: 5 pieces.

Note: For cutting data recommendations see item 191637.



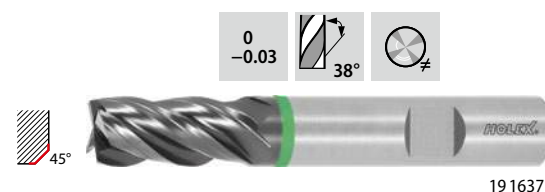
19 1639_SET

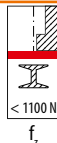
Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si										INOX	INOX	Ti	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	●	●	●	●	●
19 1639					74	64	42	32						26	21							

Type	SET															
12W 19 1639	End mill SET HSS-E-SPM															
	TiAIN															
	eShop															



The diagram shows a composite shaft of total length L . The left portion has a length L_c and is a hollow shaft with an outer diameter $\varnothing D_c$ and an inner diameter $\varnothing D_i$. The right portion has a length $L - L_c$ and is a solid shaft with a diameter $\varnothing D_s$.



Ø D _c	11W 19 1635		12W 19 1637		L _c		L		Ø D _s		
	Garant		HOLEX								
	End mill										
	HSS-E-SPM HPC				19 1635	19 1637			19 1635	19 1637	
mm	TiAIN	TiAIN	mm	mm	mm	mm	mm	mm	mm	mm	
3	eShop	eShop	8	8	52	6	6	0.008			
3,5	eShop	—	10	—	54	6	—	0.008			
4	eShop	eShop	11	11	55	6	6	0.012			
4,5	eShop	—	11	—	55	6	—	0.012			
5	eShop	eShop	13	13	57	6	6	0.012			
6	eShop	eShop	13	13	57	6	6	0.016			
7	eShop	—	16	—	66	10	—	0.016			
8	eShop	eShop	19	19	69	10	8	0.024			
9	eShop	—	19	—	69	10	—	0.024			
10	eShop	eShop	22	22	72	10	10	0.038			
12	eShop	eShop	26	26	83	12	12	0.052			
14	eShop	eShop	27	26	83	12	12	0.06			
16	eShop	eShop	32	32	92	16	16	0.066			
18	eShop	eShop	32	32	92	16	16	0.07			
20	eShop	eShop	38	38	104	20	20	0.075			
25	eShop	eShop	45	45	121	25	25	0.08			



Garant Semi-roughing end mill

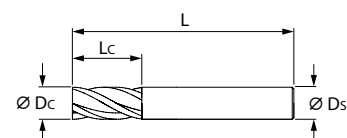
Relief ground truncated-type roughing profile.

Centre cutting teeth for plunging.

The wide tooth lands can be re-ground frequently without losing the profile.

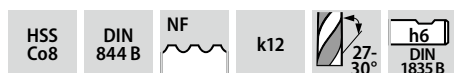
Universal cutter for profile milling or for plunging.

Advantage: Compared to multi-flute cutters, **better chip evacuation due to larger flutes.**



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	K	N	O					
19 1700		83	30	25	25										23	55	O					

Ø k10 D _c	19 1700	L _c	L	Ø D _s	Corner chamfer width at 45°	f _z
mm	mm	mm	mm	mm	mm	mm
8	eShop	38	88	10	0.3	0.016
10	eShop	45	95	10	0.3	0.025
12	eShop	53	110	12	0.5	0.04
14	eShop	53	110	12	0.5	0.04
16	eShop	63	123	16	0.5	0.05
20	eShop	75	141	20	0.5	0.06



Garant Semi-roughing end mill

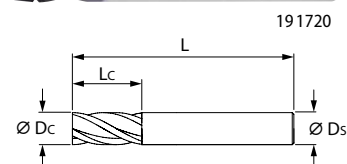
19 1710 – **Relief ground fine pitch semi-roughing profile.**

19 1720 – Size 10 – 30 centre cutting teeth for plunging.

or a considerable performance improvement with special ground **chip breaker flutes.**

Advantage:

19 1720 – The chip breaker flutes **facilitate chip evacuation** and at the same time ensure a **good component surface finish.**



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	K	N	O					
19 1710		83	30	25	25										23	55	●					
19 1720		120	78	55	55								17	14	46	92	●					

Ø k12 D _c	19 1710	19 1720	No. of teeth Z	L _c	L	Ø D _s	f _z
mm	mm	mm		mm	mm	mm	mm
6	eShop	eShop	4	13	57	6	0.012
7	eShop	eShop	4	16	66	10	0.012
8	eShop	eShop	4	19	69	10	0.018
9	eShop	eShop	4	19	69	10	0.018
10	eShop	eShop	4	22	72	10	0.028
11	eShop	eShop	4	26	79	12	0.028
12	eShop	eShop	4	26	83	12	0.042
14	eShop	eShop	4	26	83	12	0.042
16	eShop	eShop	4	32	92	16	0.05
18	eShop	eShop	4	32	92	16	0.05
20	eShop	eShop	4	38	104	20	0.06
22	eShop	eShop	5	38	104	20	0.06
25	eShop	eShop	5	45	121	25	0.064
28	—	eShop	—	45	121	25	0.068
30	eShop	eShop	5	45	121	25	0.068



Garant High performance milling cutter

Multi-flute mills with ground chip breaker on flutes.

End cutting teeth for plunging.

Special surface treatment.

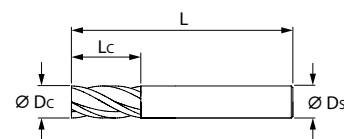
Advantage: Applicable as finishing cutter with particularly high cutting performance.



19 1850



19 1870



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 1850/1870	83			28	23	23										23	55	●	●				

Ø js12 D _c	19 1850	19 1870	L _c		L		Ø D _s	
mm	High performance end mill		19 1850 mm	19 1870 mm	19 1850 mm	19 1870 mm	mm	f _z mm
6	eShop	eShop	15	25	60	65	6	0.012
7	eShop	eShop	20	35	65	80	10	0.012
8	eShop	eShop	20	35	65	80	10	0.018
9	eShop	eShop	25	45	75	95	12	0.018
10	eShop	eShop	25	45	75	95	12	0.03
11	eShop	eShop	30	55	80	105	12	0.03
12	eShop	eShop	30	55	80	110	12	0.04
13	eShop	eShop	35	55	90	110	16	0.04
14	eShop	eShop	35	55	90	110	16	0.04
15	eShop	eShop	40	65	95	120	16	0.04
16	eShop	eShop	40	65	95	120	16	0.05
17	eShop	—	40	—	105	—	20	0.05
18	eShop	eShop	40	65	105	130	20	0.05
20	eShop	eShop	45	75	110	140	20	0.06
22	eShop	—	45	—	110	—	20	0.06
24	eShop	—	50	—	120	—	25	0.07
25	eShop	eShop	50	90	120	160	25	0.07



Roughing end mill

Relief ground knuckle form profile.

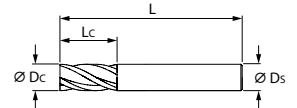
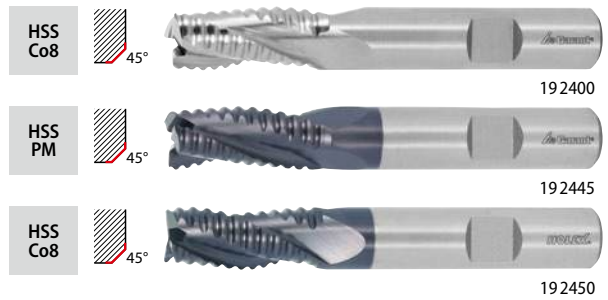
Centre cutting teeth for plunging.

Universal end mills for profile milling or for plunging.

19 2445 – For the most demanding metal removal rates.

19 2450 – Economy version.

Advantage: Compared to multi-flute cutters, **better chip evacuation due to larger flutes.**



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast Si 	Alu cast > 10 % Si										INOX 	INOX 	GG(G)	CuZn	Uni						
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	K	N							
19 2400		83		28	23	23									23	55	●		●				
19 2445		138		83	64	64	37	32					23	18	55	110	●		●		●		
19 2450		120		78	55	55							17	14	46	92	●		●		●		

Ø js12 D _c	11W 19 2400	11W 19 2445	12W 19 2450	L _c	L	Ø D _s	Corner chamfer width at 45°	f _z
	Garant							
	Roughing end mill							
	HSS-Co8	HSS-PM TiAlN	HSS-Co8 TiAlN					
mm				mm	mm	mm	mm	mm
6	eShop	eShop	eShop	13	57	6	0.3	0.01
7	eShop	eShop	eShop	16	66	10	0.3	0.01
8	eShop	eShop	eShop	19	69	10	0.3	0.015
9	eShop	eShop	eShop	19	69	10	0.4	0.015
10	eShop	eShop	eShop	22	72	10	0.4	0.025
11	eShop	—	eShop	22	79	12	0.6	0.025
12	eShop	eShop	eShop	26	83	12	0.6	0.03
14	eShop	eShop	eShop	26	83	12	0.6	0.03
15	eShop	—	eShop	26	83	12	0.6	0.03
16	eShop	eShop	eShop	32	92	16	0.6	0.04
18	eShop	eShop	eShop	32	92	16	0.6	0.04
20	eShop	eShop	eShop	38	104	20	0.6	0.05
22	eShop	—	—	38	104	20	0.6	0.05
25	eShop	eShop	eShop	45	121	25	0.6	0.055



Garant Roughing end mill

Relief ground knuckle form profile.

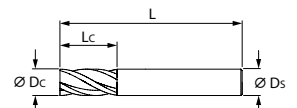
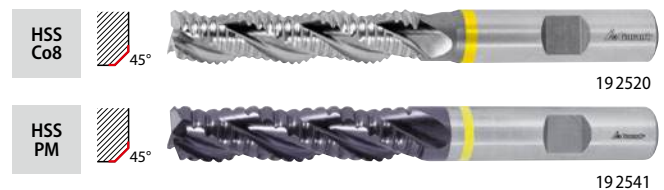
Centre cutting teeth for plunging.

■ Wide, precision ground chip flutes.

■ Special chip angle for aluminium and non-ferrous metals.

19 2541 – For the most demanding metal removal rates.

Advantage: Suitable for **high machining volumes** due to the large flutes.

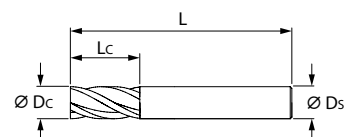
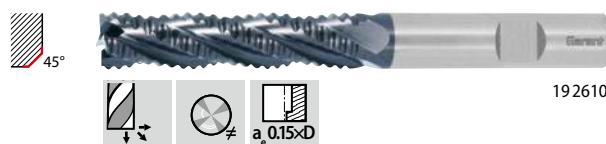


Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si										INOX	INOX	Ti	Graphite GRP CRP	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
19 2520	138	83											9						●			○	
19 2541	138												23						●		●		

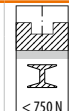
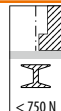
Ø js14 D _c	11W	19 2520	11W	19 2541	L _c	L	Ø D _s	Corner chamfer width at 45°		 Alu f _z
	Roughing end mill							19 2520	19 2541	
	HSS-Co8	HSS-PM		mm				mm		
mm			TiAlN		mm	mm	mm	mm	mm	mm
10		eShop		eShop	45	95	10	0.3	0.5	0.04
12		eShop		eShop	53	110	12	0.5	0.7	0.05
14		eShop		eShop	53	110	12	0.5	0.7	0.055
16		eShop		eShop	63	123	16	0.5	0.7	0.075
18		eShop		eShop	63	123	16	0.5	0.7	0.075
20		eShop		eShop	75	141	20	0.5	1	0.08
22		eShop		—	75	141	20	0.5	—	0.08
25		eShop		eShop	90	166	25	0.5	1	0.09

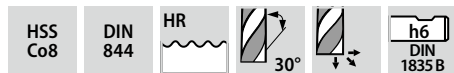


192605/2610 – End face geometry for plunging and unequal spacing of the teeth.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast Alu cast > 10 % Si 												INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	K	N						
19 2600		83	30	25	25	12										23		●	●				
19 2605		120	78	55	55	29	25							17	14	46	90	●	●			○	
19 2610		100	60	45	45									13	11	36	73	●	●			○	

Ø k12 D _c	11W	11W	11W	No. of teeth Z	L _c		L			Ø D _s	Corner chamfer width at 45°				
	19 2600	19 2605	19 2610		Roughing end mill			19 2600 19 2605	19 2610			19 2600	19 2605	19 2600 19 2605	19 2610
					HSS-Co8										
mm		TiAIN	TiAIN		mm	mm	mm	mm	mm	mm	mm	mm	mm		
6	eShop	eShop	eShop	4	13	24	57	57	68	6	0.5	0.006	0.01		
6M	—	eShop	—	4	19	—	—	63	—	6	0.5	0.006	—		
7	eShop	eShop	eShop	4	16	30	66	66	80	10	0.5	0.006	0.01		
8	eShop	eShop	eShop	4	19	38	69	69	88	10	0.5	0.09	0.014		
8M	—	eShop	—	4	28	—	—	78	—	10	0.5	0.09	—		
9	eShop	eShop	eShop	4	19	38	69	69	88	10	0.5	0.09	0.014		
10	eShop	eShop	eShop	4	22	45	72	72	95	10	0.5	0.014	0.019		
10M	—	eShop	—	4	35	—	—	84	—	10	0.5	0.014	—		
11	eShop	eShop	eShop	4	22	45	79	79	102	12	0.5	0.014	0.019		
12	eShop	eShop	eShop	4	26	53	83	83	110	12	0.5	0.021	0.029		
12M	—	eShop	—	4	40	—	—	97	—	12	0.5	0.021	—		
13	eShop	eShop	eShop	4	26	53	83	83	110	12	0.5	0.021	0.029		
14	eShop	eShop	eShop	4	26	53	83	83	110	12	0.5	0.021	0.029		
15	eShop	eShop	eShop	4	26	53	83	83	110	12	0.5	0.021	0.029		
16	eShop	eShop	eShop	4	32	63	92	92	123	16	0.5	0.025	0.047		
16M	—	eShop	—	4	45	—	—	108	—	16	0.5	0.025	—		
17	eShop	—	—	4	32	—	92	—	—	16	0.5	0.025	—		
18	eShop	eShop	eShop	4	32	63	92	92	123	16	0.5	0.025	0.047		
19	eShop	—	—	4	32	—	92	—	—	16	0.5	0.025	—		
20	eShop	eShop	eShop	4	38	75	104	104	141	20	0.5	0.031	0.057		
20M	—	eShop	—	4	58	—	—	122	—	20	0.5	0.031	—		
22	eShop	eShop	eShop	5	38	75	104	104	141	20	0.5	0.031	0.057		
24	eShop	—	—	5	45	—	121	—	—	25	0.5	0.031	—		
25	eShop	eShop	eShop	5	45	90	121	121	166	25	0.5	0.031	0.061		
25M	—	eShop	—	5	68	—	—	144	—	25	0.5	0.031	—		
26	eShop	—	—	5	45	—	121	—	—	25	0.5	0.031	—		
28	eShop	eShop	eShop	5	45	90	121	121	166	25	0.5	0.031	0.061		
30	eShop	eShop	eShop	5	45	90	121	121	166	25	0.5	0.031	0.061		
32	eShop	eShop	eShop	6	53	106	133	133	186	32	0.5	0.031	0.066		
35	eShop	—	—	6	53	—	133	—	—	32	0.5	0.031	—		
40	eShop	—	eShop	6	63	125	155	—	217	32	0.5	0.031	0.066		

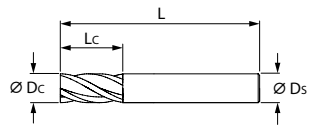


Roughing end mill

Relief ground fine pitch knuckle form profile.

Centre cutting teeth for plunging.

19 2850 – Economy version.



±0.12



19 2840

js12



19 2850

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N					
19 2840		120		78	55	55	29	25					17	14	46	92	92	●	●	●	○	○
19 2850		120		78	55	55							17			92	92	●	●	●	○	○

Ø D _c	19 2840 Garant	19 2850 HOLEX	No. of teeth Z	L _c	L	Ø D _s	Corner chamfer width at 45°	f _z
mm	TiAlN	TiAlN	19 2840	19 2850	mm	mm	mm	mm
4	eShop	—	3	—	12	55	6	0.007
5	eShop	—	3	—	13	57	6	0.007
6	eShop	eShop	3	3	13	57	6	0.01
7	eShop	—	3	—	16	66	10	0.01
8	eShop	eShop	4	3	19	69	10	0.014
9	eShop	—	4	—	19	69	10	0.014
10	eShop	eShop	4	4	22	72	10	0.018
11	eShop	—	4	—	22	79	12	0.018
12	eShop	eShop	4	4	26	83	12	0.026
13	eShop	—	4	—	26	83	12	0.026
14	eShop	eShop	4	4	26	83	12	0.026
16	eShop	eShop	4	4	32	92	16	0.033
18	eShop	—	4	—	32	92	16	0.033
20	eShop	eShop	4	4	38	104	20	0.043
22	eShop	—	5	—	38	104	20	0.043
25	eShop	—	5	—	45	121	25	0.054
28	eShop	—	5	—	45	121	25	0.062
30	eShop	—	5	—	45	121	25	0.065



Garant Roughing end mill HPC

Special **SPM** substrate with very high cobalt content.

Combines the **hardness of solid carbide** and the **toughness of PM steel**.

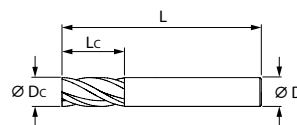
Centre cutting teeth profile for plunging.

Application: For very high metal removal rates and increased machining volumes on stainless steels.

DIN 327



19 2852



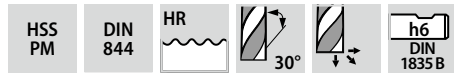
DIN 844



19 2855

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	N						
19 2852/2855		159		95	74	74	42						26	21	20		○	●	●	○	○	○

Ø k12 D _c	19 2852	19 2855	No. of teeth Z	L _c	L	Ø D _s	Corner chamfer width at 45°	f _z
mm	TiAlN	TiAlN	19 2852	19 2855	mm	mm	mm	mm
6	eShop	eShop	3	8	13	52	57	0.008
8	eShop	eShop	4	11	19	61	69	0.012
10	eShop	eShop	4	13	22	63	72	0.019
12	eShop	eShop	4	16	26	73	83	0.029
14	eShop	eShop	4	16	26	73	83	0.03
16	eShop	eShop	5	19	32	79	92	0.034
18	eShop	eShop	5	19	32	79	92	0.038
20	eShop	eShop	5	22	38	88	104	0.042
25	eShop	eShop	5	26	45	102	121	0.047
32	eShop	eShop	6	32	53	112	133	0.055



Roughing end mill

Relief ground fine pitch knuckle form profile.

Centre cutting teeth for plunging.

19 2860 – Size 6M to 25M – **MID mills**: Dimensions to **manufacturer's standard**, which is **between DIN 844 stub and DIN 844 long**.

19 2890 – Economy version.

±0.12

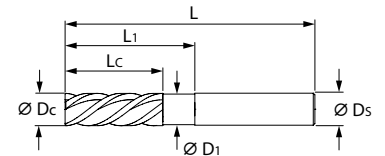


19 2860

k12



19 2890



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 2860		138		83	64	64	37	32						23	18	55	110	●	●	●	●	●	●
19 2890		138		83	64	64	37	32						23	18		110	●	●	●	●	●	●

Ø D _c	11W	19 2860	12W	19 2890	No. of teeth Z		L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	
		Garant		HOLEX									
		Roughing end mill											
		HSS-PM			19 2860	19 2890		19 2860	19 2860				
mm		TiAlN		TiAlN			mm	mm	mm	mm	mm	mm	mm
4		eShop		–	3	–	12	–	–	55	6	0.3	0.006
5		eShop		–	3	–	13	–	–	57	6	0.3	0.006
6		eShop		eShop	4	4	13	20	5.5	57	6	0.3	0.008
6M		eShop		–	4	–	19	26	5.5	63	6	0.3	0.008
7		eShop		–	4	–	16	–	–	66	10	0.3	0.008
8		eShop		eShop	4	4	19	–	–	69	10	0.3	0.015
8M		eShop		–	4	–	28	–	–	78	10	0.3	0.015
9		eShop		–	5	–	19	–	–	69	10	0.3	0.015
10		eShop		eShop	5	5	22	31	9.5	72	10	0.3	0.024
10/4		eShop		–	4	–	22	31	9.5	72	10	0.3	0.024
10M		eShop		–	5	–	35	43	9.5	84	10	0.3	0.024
11		eShop		–	5	–	22	–	–	79	12	0.3	0.024
12		eShop		eShop	5	5	26	–	–	83	12	0.3	0.033
12/4		eShop		–	4	–	26	37	11.5	83	12	0.3	0.033
12M		eShop		–	5	–	40	51	11.5	97	12	0.3	0.033
13		eShop		–	5	–	26	–	–	83	12	0.3	0.033
14		eShop		eShop	5	5	26	–	–	83	12	0.3	0.033
14/4		eShop		–	4	–	26	–	–	83	12	0.3	0.033
15		eShop		–	5	–	26	–	–	83	12	0.3	0.033
16		eShop		eShop	5	5	32	43	15.5	92	16	0.3	0.041
16/4		eShop		–	4	–	32	43	15.5	92	16	0.3	0.041
16M		eShop		–	5	–	48	59	15.5	108	16	0.3	0.041
18		eShop		eShop	5	5	32	–	–	92	16	0.3	0.041
20		eShop		eShop	5	5	38	53	19.5	104	20	0.3	0.048
20/4		eShop		–	4	–	38	53	19.5	104	20	0.3	0.048
20M		eShop		–	5	–	58	71	19.5	122	20	0.3	0.048
22		eShop		–	5	–	38	–	–	104	20	0.3	0.052
25		eShop		eShop	6	5	45	64	24.5	121	25	0.3	0.052
25M		eShop		–	6	–	68	87	24.5	144	25	0.3	0.054
30		eShop		–	6	–	45	–	–	121	25	0.3	0.064
32		–		eShop	–	6	53	–	–	133	32	0.3	0.064



Garant Roughing end mill MTC

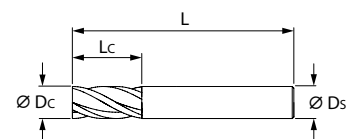
SPM substrate with very high cobalt content. Combines the **hardness of solid carbide** with the **toughness of PM steel**. **Dynamic special knuckle profile for roughing**.

For use as a universal roughing end mill Centre cutting edge geometry for plunging.

Application: For very high metal removal rates and increased machining volumes. Especially for MTC (Multi Task Cutting) use on the new generation of turning / milling centres.

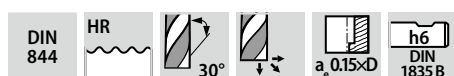


19 2895



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
19 2895				95	75	75	40	35						25	20	14							

$\varnothing$ k12 D_c	11W	19 2895	No. of teeth Z	L_c	L	$\varnothing D_s$	Corner chamfer width at 45°	
		Roughing end mill MTC						
		HSS-E-SPM						
		TiAlN						
mm				mm	mm	mm	mm	mm
6		eShop	3	13	57	6	0.2	0.014
8		eShop	4	19	69	10	0.2	0.02
10		eShop	4	22	72	10	0.2	0.032
12		eShop	4	26	83	12	0.2	0.044
14		eShop	4	26	83	12	0.2	0.051
16		eShop	5	32	92	16	0.2	0.053
18		eShop	5	32	92	16	0.2	0.059
20		eShop	5	38	104	20	0.2	0.065



Roughing end mill

Relief ground fine pitch knuckle form profile.

Centre cutting teeth for plunging.

19 2925 – For the most demanding metal removal rates.

19 2930 – Economy version.

Advantage:

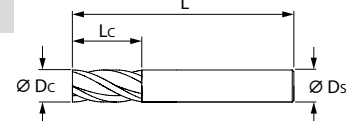
19 2925 – Excellent results when milling dry.



19 2925

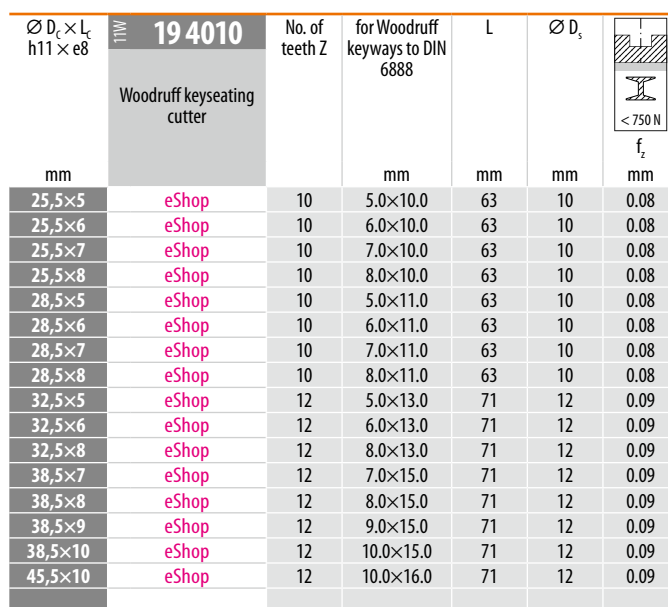


19 2930



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 2925		138	110	83	64	64	37	32						23	18	55	110						
19 2930		120	101	78	55									17			92						

$\varnothing D_c$	11W	19 2925	12W	19 2930	No. of teeth Z	L_c	L	$\varnothing D_s$	Corner chamfer width at 45°	
		Garant		HOLEX						
		Roughing end mill								
		HSS-PM		HSS-Co8						
		TiAlN		TiAlN						
mm						mm	mm	mm	19 2925 mm	19 2930 mm
10		eShop		eShop	4	45	95	10	0.5	0.18
12		eShop		eShop	4	53	110	12	0.5	0.18
14		eShop		—	4	53	110	12	0.5	—
16		eShop		eShop	4	63	123	16	0.5	0.25
18		eShop		—	4	63	123	16	0.5	—
20		eShop		eShop	4	75	141	20	0.5	0.25
25		eShop		—	5	90	166	25	0.5	—
32		eShop		—	6	106	186	32	0.5	—



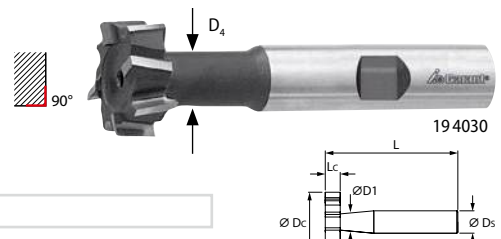


Garant T-slot cutter

The mill cuts on all three sides.

Due to alternate set teeth (staggered), high cutting performance is achieved.

Note: For milling T-slots to DIN 650 into machine tables on jigs and fixtures.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 4030	250	70		35	28											22	35						

Ø D _c × L _c d11 × d11	19 4030	Number of effective inserts Z _{eff}	No. of teeth Z	for T-slots DIN 650	Ø D ₁	L	Ø D _s	f _z
mm	T-slot cutter				mm	mm	mm	mm
12,5×6	eShop	3	6	6	5	57	10	0.06
16×8	eShop	3	6	8	7	62	10	0.06
18×8	eShop	3	6	10	8	70	12	0.06
21×9	eShop	4	8	12	10	74	12	0.08

Ø D _c × L _c d11 × d11	19 4030	Number of effective inserts Z _{eff}	No. of teeth Z	for T-slots DIN 650	Ø D ₁	L	Ø D _s	f _z
mm	T-slot cutter				mm	mm	mm	mm
25×11	eShop	4	8	14	12	82	16	0.08
28×12	eShop	4	8	16	13	85	16	0.08
32×14	eShop	4	8	18	15	90	16	0.09

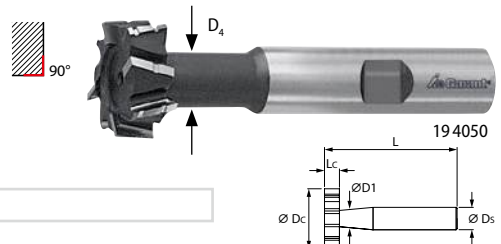


Garant T-slot semi-roughing cutter

Cuts on all three sides.

Alternate set teeth with ground chip breaker on flutes.

Note: For milling T-slots to DIN 650.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 4050	250	70		35	28											22	35						

Ø D _c × L _c d11 × d11	19 4050	Number of effective inserts Z _{eff}	No. of teeth Z	for T-slots DIN 650	Ø D ₁	L	Ø D _s	f _z
mm	T-slot semi-roughing cutter				mm	mm	mm	mm
12,5×6	eShop	3	6	6	5	57	10	0.06
16×8	eShop	4	8	8	7	62	10	0.06
18×8	eShop	4	8	10	8	70	12	0.06
21×9	eShop	4	8	12	10	74	12	0.08
25×11	eShop	4	8	14	12	82	16	0.08

Ø D _c × L _c d11 × d11	19 4050	Number of effective inserts Z _{eff}	No. of teeth Z	for T-slots DIN 650	Ø D ₁	L	Ø D _s	f _z
mm	T-slot semi-roughing cutter				mm	mm	mm	mm
28×12	eShop	4	8	16	13	85	16	0.08
32×14	eShop	4	8	18	15	90	16	0.09
36×16	eShop	4	8	20	17	103	25	0.09
40×18	eShop	4	8	22	19	108	25	0.09



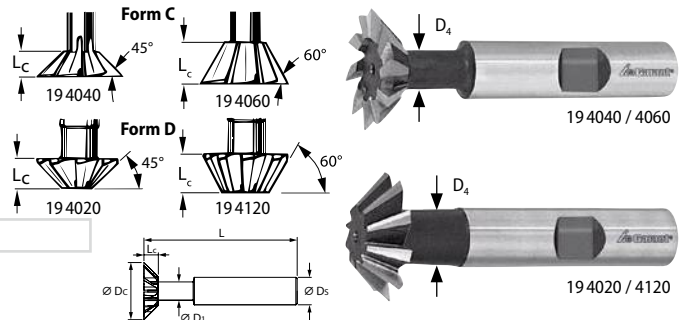
Garant Dovetail milling cutter

Special surface treatment.

194020/4120 – Form D cuts only on the circumference, straight teeth.

194040/4060 – Form C cuts frontal and on the circumference.

Note: For milling small dovetails in tool making and machine building.



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si												INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	K	N						
19 4020–19 4120	250	70		35	28												22	35	●		●			

Ø js16 D _c	 19 4040	 19 4020	 19 4060	 19 4120	No. of teeth Z	Ø D ₁				L	Ø D _s	L _c		 < 750 N f _z
	Dovetail milling cutter, form C	Dovetail milling cutter, form D	Dovetail milling cutter, form C	Dovetail milling cutter, form D		19 4040	19 4020	19 4060	19 4120			19 4040 19 4020	19 4060 19 4120	
	45°	45°	60°	60°										
mm						mm	mm	mm	mm	mm	mm	mm	mm	mm
16	eShop	eShop	eShop	eShop	6	6.7	8	6	8.2	60	12	4	6.3	0.06
20	eShop	eShop	eShop	eShop	8	7	10	7.8	10.5	63	12	5	8	0.08
22	eShop	eShop	eShop	eShop	8	8	10.2	10	10.2	67	12	6	9	0.08
25	eShop	eShop	eShop	eShop	10	8	11	9	11.5	67	12	6.3	10	0.08
28	eShop	eShop	eShop	eShop	10	8.5	14	13	14	80	16	7.5	11	0.08
32	eShop	eShop	eShop	eShop	12	13	15	15	15	71	16	8	12.5	0.09
38	eShop	eShop	eShop	eShop	14	15	15	15	15	80	16	10	16	0.09

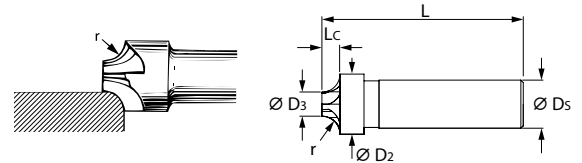


19 4220

Garant Corner rounding cutter

Straight flutes. Special surface treatment.

Application: For rounding and deburring edges and contours.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 4220	138	83		28	23	23										23	55	●	●	●	●	●	●

Radius r H11 D_c	19 4220	No. of teeth Z	$\varnothing D_3$	$\varnothing D_2$	L_c	L	$\varnothing D_s$	f_z
mm	Corner rounding cutter		mm	mm	mm	mm	mm	mm
1	eShop	4	6	8	1	60	10	0.003
1,5	eShop	4	6	9	1.5	60	10	0.003
2	eShop	4	6	10	2	60	10	0.005
2,5	eShop	4	6	11	2.5	60	10	0.005
3	eShop	4	6	12	3	60	12	0.005
4	eShop	4	6	14	4	60	12	0.007
5	eShop	4	6	16	5	60	16	0.007
6	eShop	4	8	20	6	67	16	0.01
8	eShop	4	8	24	8	71	16	0.015
10	eShop	4	8	28	10	85	25	0.024
12	eShop	4	10	34	12	90	25	0.032
16	eShop	6	16	48	16	100	25	0.053



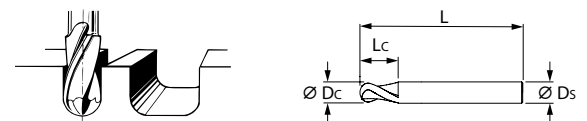
Garant Ball nose slot drill

Centre cutting edge geometry for plunging.
For the most demanding metal removal rates.

Note: For milling concave slots or for milling radius transitions.
Suitable for use as a copy mill and for mould making.
 f_z for a_p 0.05 x D.



19 4302



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
19 4302	138	110	83	64	64	37	32							23	18	55	110	●	●	●	●	●	●

$\varnothing e8$ D_c	19 4302	L_c	L	$\varnothing D_s$	f_z
mm	Ball nose slot drill	mm	mm	mm	mm
	HSS-PM				
	TiAlN				
2	eShop	4	48	6	0.006
3	eShop	5	49	6	0.006
4	eShop	7	51	6	0.012
5	eShop	8	52	6	0.012
6	eShop	8	52	6	0.016
7	eShop	10	60	6	0.016
8	eShop	11	61	8	0.024
9	eShop	11	61	8	0.024
10	eShop	13	63	10	0.038
11	eShop	13	70	10	0.038
12	eShop	16	73	12	0.052
13	eShop	16	73	12	0.052

$\varnothing e8$ D_c	19 4302	L_c	L	$\varnothing D_s$	f_z
mm	Ball nose slot drill	mm	mm	mm	mm
	HSS-PM				
	TiAlN				
14	eShop	16	73	12	0.052
15	eShop	16	73	14	0.052
16	eShop	19	79	16	0.066
18	eShop	19	79	16	0.066
19	eShop	19	79	16	0.066
20	eShop	22	88	20	0.076
22	eShop	22	88	20	0.076
24	eShop	26	102	20	0.076
25	eShop	26	102	25	0.076
26	eShop	26	102	25	0.076
30	eShop	26	102	25	0.076

Categorisation of the tools by application based on DIN ISO 513

Material group	Material designations	Strength (N/mm ²)
17.0	Long-chipping Al; wrought Al alloy; Mg	N < 530
17.1	Short-chipping Al alloys	N < 600
17.2	Cast Al alloys > 10 % Si	N < 600
18.0	Low-alloy copper	N < 400
18.1	Short-chipping brass	N < 600
18.2	Long-chipping brass	N < 600
18.3	Short-chipping bronze	N < 600
18.4	Short-chipping bronze	N 650 – 850
18.5	Long-chipping bronze	N < 850
18.6	Long-chipping bronze	N 850 – 1200

GARANT Master Alu*



20 2004, GARANT Master Alu PickPocket



20 3115, GARANT Master Alu milling cutter TPC



20 3205, GARANT Master Alu finishing cutter



20 5282, GARANT Master Alu SlotMachine

N

Material group	Material designations	Strength (N/mm ²)
10.0	Hardened steels	H 45 – 50 HRC
10.1	Hardened steels	H 50 – 55 HRC
10.2	Hardened steels	H 55 – 60 HRC
10.3	Hardened steels	H 60 – 65 HRC
10.4	Hardened steels	H 65 – 67 HRC
10.5	Hardened steels	H 67 – 70 HRC

GARANT hard machining*



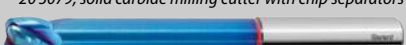
20 1631, Diabolo solid carbide micro slot drill



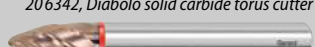
20 3221, GARANT Diabolo solid carbide milling cutter HRC 62



20 3079, solid carbide milling cutter with chip separators



20 6342, Diabolo solid carbide torus cutter



20 7523, solid carbide barrel milling cutter PPC



20 8158, Diabolo solid carbide deburrer, spiral flutes

H

Hoffmann Group colour ring code

Colour code DIN-ISO 513

Alu	Alu	Alu cast > 10 % Si	Cu	CuZn	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC
D	I	N	I	S	O	5	1	3						
N	N	N	N	N	P	P	P	P	P	H	H	H	H	H

P



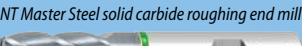
20 2289, GARANT Master Steel solid carbide mini milling cutter



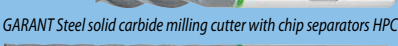
20 2404, GARANT Master Steel PickPocket



20 3035, GARANT Master Steel solid carbide roughing end mill



20 3049, GARANT Steel solid carbide milling cutter with chip separators HPC



20 4018, GARANT Master Steel solid carbide finishing cutter



20 3055, GARANT GreenPlus solid carbide milling cutter HPC



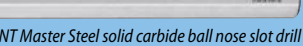
20 5550, GARANT Master Steel SlotMachine



20 6335, GARANT Master Steel solid carbide torus cutter



20 7246, GARANT Master Steel solid carbide ball nose slot drill



20 7525, solid carbide barrel milling cutter PPC

GARANT Master Steel*

Material group	Material designations	Strength (N/mm ²)
1.0	General structural steels	P < 500
1.1	General structural steels	P 500 – 850
2.0	Free-cutting steels	P < 850
2.1	Free-cutting steels	P 850 – 1000
3.0	Unalloyed heat-treatable steels	P < 700
3.1	Unalloyed heat-treatable steels	P 700 – 850
3.2	Unalloyed heat-treatable steels	P 850 – 1000
4.0	Alloyed heat-treatable steels	P 850 – 1000
4.1	Alloyed heat-treatable steels	P 1000 – 1200
5.0	Unalloyed case-hardening steels	P < 750
6.0	Alloyed case-hardening steels	P < 1000

Material group	Material designations	Strength (N/mm ²)
6.1	Alloyed case-hardening steels	P > 1000
7.0	Nitriding steels	P < 1000
7.1	Nitriding steels	P > 1000
8.0	Tool steels	P < 850
8.1	Tool steels	P 850 – 1100
8.2	Tool steels	P 1100 – 1400
9.0	High-speed steels	P 830 – 1200
11.0	Abrasion-resistant structural steel	P 1350
11.1	Abrasion-resistant structural steel	P 1800
12.0	Spring steels	P < 1500
13.3	Stainless steels, martensitic	P < 1100

*Tool selection

Material group	Material designations		Strength (N/mm ²)
13.0	Stainless steels, sulphuretted	M	< 700
13.1	Stainless steels, austenitic	M	< 700
13.2	Stainless steels, austenitic	M	< 850

GARANT Master INOX*



20 2956, GARANT INOX solid carbide milling cutter with chip separators HPC/TPC



20 3106, solid carbide milling cutter TPC with chip separators



20 5449, GARANT INOX SlotMachine solid carbide roughing end mill HPC



20 6345, GARANT Master INOX solid carbide torus cutter



20 7474, GARANT Master INOX solid carbide ball nose end mill



20 7537, solid carbide barrel milling cutter PPC

M

Material group	Material designations		Strength (N/mm ²)
15.0	Cast iron (GG)	K	< 180 HB
15.1	Cast iron (GG)	K	> 180 HB
15.2	Cast iron (GGG, GT)	K	> 180 HB
15.3	Cast iron (GGG, GT)	K	> 260 HB

GARANT machining cast iron*



20 2392, solid carbide milling cutter MTC



20 3049, GARANT Steel solid carbide milling cutter with chip separators HPC

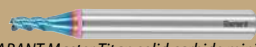


20 3055, GARANT GreenPlus solid carbide milling cutter HPC

K

	INOX < 900 N	INOX > 900 N	Ti > 850 N	Inconel ¹	GG(G)	GRP CRP	Graphite	Plastics
	D	I	N	I	S	5	1	3
	M	M	S	S	K	O	O	O

S



20 2287, GARANT Master Titan solid carbide mini milling cutter



20 3157, GARANT Master Titan solid carbide milling cutter



20 6371, GARANT Master Ni-Based solid carbide torus cutter



20 7487, GARANT Master Titan solid carbide ball nose end mill

GARANT Master Titan* / GARANT Master Ni-Based*

Material group	Material designations		Strength (N/mm ²)
14.0	Special alloys	S	< 1200
16.0	Titanium, titanium alloys	S	< 850
16.1	Titanium, titanium alloys	S	850 – 1200

O



20 9320, solid carbide slot drill for work on plastics



20 9806, GARANT PCD ball nose slot drill with internal cooling



20 9517, solid carbide milling cutter for GRP, CRP, graphite



20 9540, solid carbide milling cutter Composite, dragging cut



20 9548, solid carbide milling cutter Composite, compacting cut

GARANT non-metallic materials*

Material group	Material designations		Strength (N/mm ²)
19.0	Graphite	O	
20.0	Thermoplastic	O	
20.0.1	Acrylic	O	
20.0.2	PE-HD	O	
20.0.3	PA 66	O	
20.0.4	PEEK	O	
20.1	Thermoset plastic	O	
20.1.1	PF 31	O	
20.2	GRP and CRP	O	
20.2.1	AFRP aramid	O	
20.2.10	MMC	O	
20.2.11	CRP	O	
20.2.2	PVDF GF20	O	
20.2.3	POM GF25	O	
20.2.4	PA 66 GF30	O	
20.2.5	PEEK GF30	O	
20.2.6	PTFE CF25	O	
20.2.7	PEEK CF30	O	
20.2.9	Honeycomb sandwich	O	



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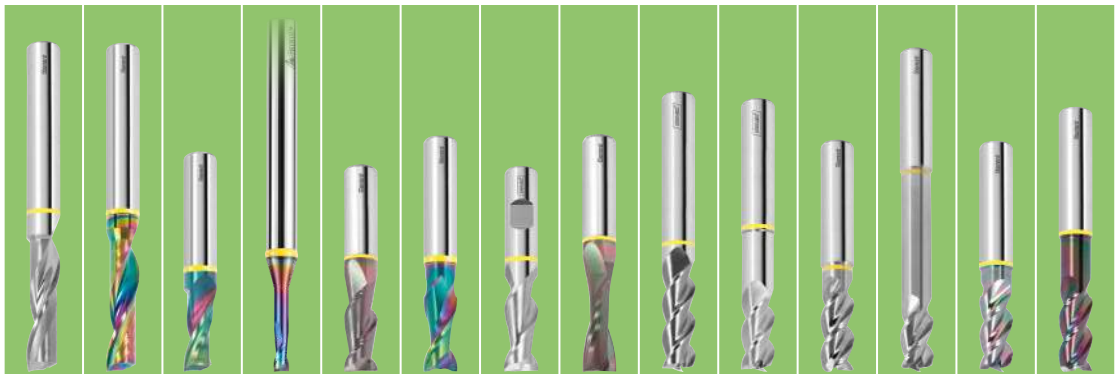
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Solid carbide milling cutters for machining non-ferrous metals

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Milling cutter type	Milling cutters													
DIN >	Man. std	Man. std	Man. std	Man. std	6527	6527	6527	Man. std	Man. std	Man. std	6527	Man. std	6527	Man. std
			GARANT Master Alu	Micro precision		GARANT Master Alu								
Hoffmann Group code														
Article number	201040 201043	201045 201046	201070 201075	201140	201170 201270	201260	201200 201280	201735	202238	202239 202241 202242	202243 202244 202249	202247 202256 202257	202270 202272 202278	202271 202273
Milling cutter type	W	W	W	W	W	W	W	W	W	W	W	W	W	W
Application recommendation														
Size range (Ø mm)	1 – 12	1 – 12	2 – 12	0.1 – 3	2 – 20	2 – 20	2 – 20	1 – 20	3 – 20	3 – 20	1 – 25	4 – 20	1 – 20	6 – 20
Cutting edge length (mm)	6 – 45	4 – 45	5 – 33	0.15 – 4.6	5 – 38	8 – 38	5 – 38	5 – 41	9 – 60	6 – 60	2.5 – 60	6.5 – 41	2.5 – 60	13 – 41
Number of cutting edges	1	1	1	2	2	2	2	2/3	3	3	3	3	3	3
Coolant channels IC											– / IC		– / IC	
HSC / HPC / MTC / TPC / PPC	HSC	HSC	HPC	HSC	HSC	HPC		HSC			MTC	MTC	MTC	MTC
Coating		DLC	(DLC)	DLC	DLC	DLC		DLC					DLC	DLC
Type of shank	HA	HA	HA	HA	HA	HA	HB	HA	HA	HA	HA/HB	HA/HB	HA/HB	HA/HB
Secondary application to DIN ISO 513	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Page	428	428	429	430/431	432	432	432	438	438	438	439	440	441	442

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Solid carbide milling cutters for machining non-ferrous metals

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Milling cutter type	Finishing cutters	Roughing end mills						Torus cutters					
DIN >	Man. std	6527/Man. std	6527/Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	6527/Man. std	
	GARANT Master Alu	GARANT Master Alu SlotMachine		GARANT Master Alu SlotMachine	GARANT Master Alu SlotMachine	GARANT Master Alu SlotMachine		Micro precision					
Hoffmann Group code													
Article number	203213/203214 203215/203216	205250 205255 205265	205260 205270	205267	205274 205275	205282	205330/31 205335/36	206041– 206045	206040	206065 206071 206075	206260 206265	206190 206192	
Milling cutter type	W	WR	WR	WR	WR	WR	WR	W	W	W	W	W	
Application recommendation													
Size range (Ø mm)	6 – 20	4 – 20	4 – 20	6 – 20	6 – 20	6 – 20	4 – 20	0.2 – 3	3 – 20	3 – 20	5 – 20	5 – 20	
Cutting edge length (mm)	20 – 105	8 – 60	8 – 60	18 – 60	25 – 82	20 – 64	11 – 38	0.2 – 4.5	4 – 20	4 – 20	13 – 41	8 – 41	
Number of cutting edges	7	3/4	3	3/4	3/4	5	3	2	2	2	3	3	
Coolant channels IC		– / IC		IC			– / IC						
HSC / HPC / MTC / TPC / PPC	HPC	HPC	HPC	HPC/TPC	TPC	HPC/TPC		HSC	HSC	HSC	HPC	HSC	
Coating		DLC		DLC	DLC	DLC	(DLC)	DLC		DLC	ZOX		
Type of shank	HA	HA	HA	HA	HA	HA	HB/HA	HA	HA	HA	HA	HA	
Secondary application to DIN ISO 513				0	0	0		0	0	0		0	
Page	487	494	494	495	495	495	496	504/505	506	506/507	510	512	

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Solid carbide milling cutters for machining non-ferrous metals

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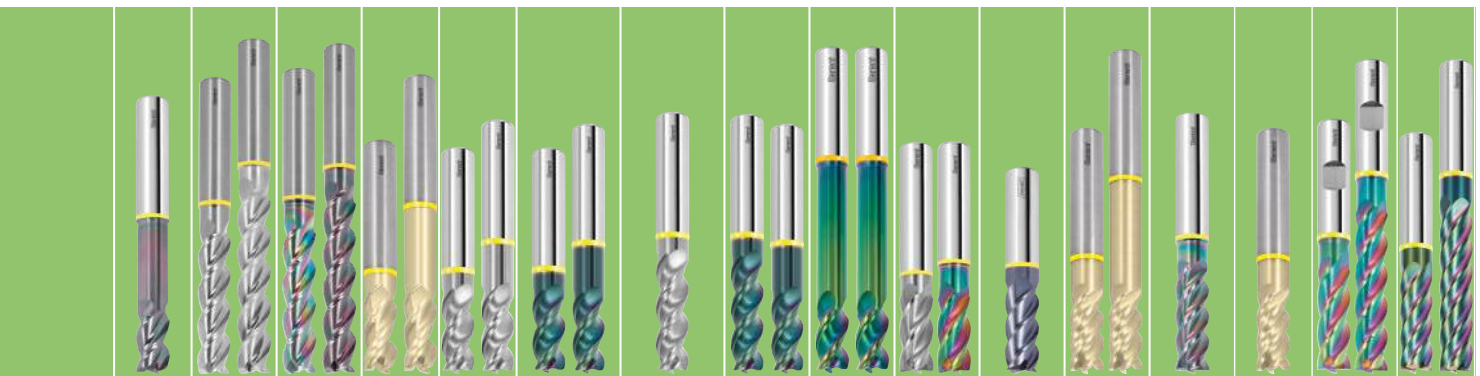
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Milling cutters

Man. std	Man. std	Man. std	Man. std	6527/Man. std	6527/Man. std	Man. std	Man. std	Man. std	6527	6527	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std
				GARANT Master Alu PickPocket	GARANT Master Alu PickPocket	GARANT Master Alu PickPocket	GARANT Master Alu PickPocket	GARANT Master Alu PickPocket	GARANT Master Alu						GARANT Master Alu	GARANT Master Alu
202274 202279	202281 202283	202282 202284	202248/51 202255/59	202002 202012	202004 202006 202014	202008	202010 202015	202017 202019	202512 202470	202545	202551 202548 202549	202552	202553	203113 203114 203115	203203 203204 203205	
W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
4–20	6–20	6–20	3–25	1.8–20	3.8–20	6–20	6–20	4–20	3–20	3–20	3–20	4–20	3–20	5–20	4–20	
6.5–32	25–102	25–102	5–52	4–41	8–41	18–60	13–60	6.5–32	6–60	10–41	6–60	16–60	6–40	17–102	16–100	
3	3	3	3	3	3	3	3	3	4	4	4	4	4	4/5	5	
–/IC			–/IC		–/IC		–/IC	–/IC						IC		
MTC	TPC	TPC	HPC	HPC	HPC	HPC	HPC	HPC	HPC		HPC	HPC	HPC	TPC	HPC	
DLC		DLC	ZOX		DLC		DLC	DLC	(DLC)	TIAlN	ZOX	DLC	ZOX	DLC	DLC	DLC
HA/HB	HA/HB	HA/HB	HA/HB	HA	HA	HA	HA	HA	HA	HA	HA/HB	HA	HA/HB	HA/HB	HA	
0	0	0		0	0	0	0	0	0	0		0		0	0	
442	443	443	444	445/446	445/446	445	445/446	446	457	457	458	458	458	478	486	

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Solid carbide milling cutters for machining non-ferrous metals

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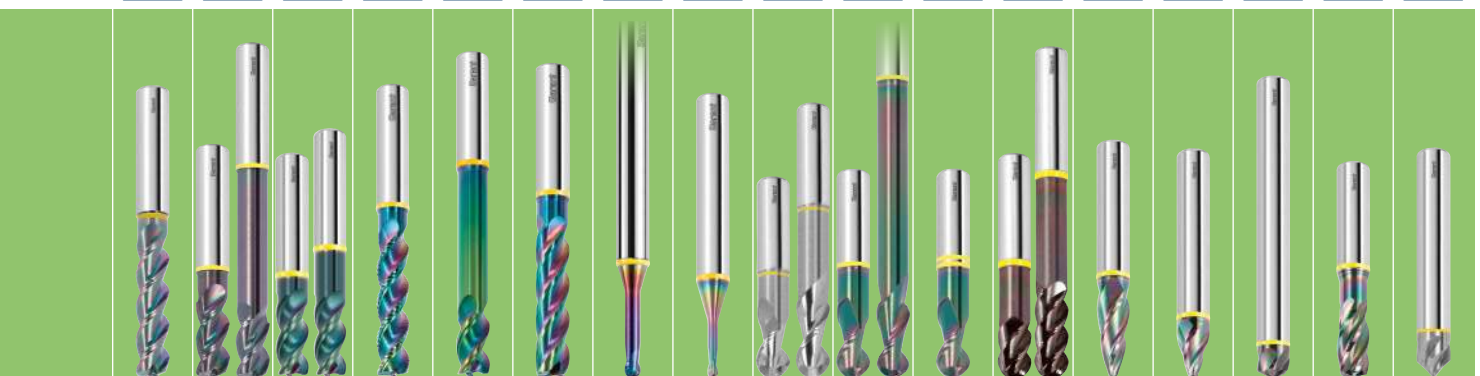
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Torus cutters

Radius Milling Tools

PPC milling cutters

Deburrer

Man. std	6527/Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std
		GARANT Master Alu PickPocket	GARANT Master Alu SlotMachine	GARANT Master Alu PickPocket	GARANT Master Alu		Micro precision	Micro precision		high precision		tangential	conical	stub/conical	straight	
206211	206230 206250	206255 206257	206258	206261	206264	207023	207025	207026 207028	207032 207072 207092	207097	207441 207443	207517	207529– 207533	207542– 207548	207514	208154
W	W	W	WR	W	W	W	W	W	W	W	W	N	N	N	N	N
6–20	4–20	4–20	6–20	4–16	6–20	0.1–3	0.5–2	3–20	3–20	3–12	3–20	6–12	6–16	8–12	10–12	0.5–16
25–82	6.5–41	8–41	25–82	6.5–25	25–82	0.08–3.5	0.4–1.6	6–40	6–40	6–16	6–40	20.5–27	8–16	1.4–3.5	21.5–23	
3	3	3	3/4	3	4/5	2	2	2	2	2	4	4	4	3/5	5	3/4
TPC	HSC	HPC	HPC/TPC	HPC	HPC	HSC	HSC	HSC	HSC	HSC	HSC	PPC	PPC	PPC	PPC	
DLC	DLC	DLC	DLC	DLC	DLC	DLC	DLC		DLC	DLC	DLC	DLC	DLC	DLC	DLC	
HA/HB	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
512/513	513	514	515	515	515	529/530	529/530	531	531	532	541	547	548	549	549	559

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Solid carbide milling cutters for machining steels



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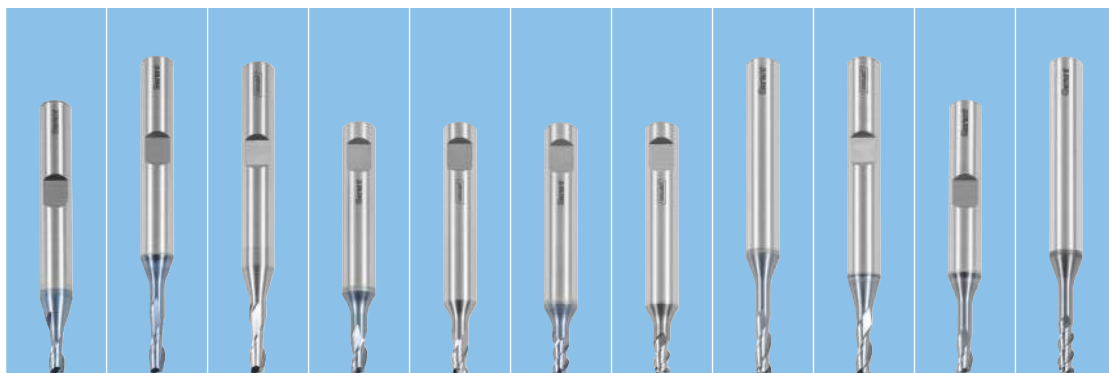
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Milling cutter type	Milling cutters										
DIN >	6527	6527	6527	Man. std	Man. std	Man. std	Man. std	6527	6527	6527	6527
Hoffmann-Group Code											
Item number	201302	201306/08	201310	202260	202262	202264	202266	202267	202275	202285	202290-202294
Milling cutter type	N	N	N	N	N	N	N	N	N	N	N
Application recommendation											
Size range (Ø mm)	0.3 – 20	0.25 – 20	2 – 20	0.5 – 20	0.5 – 20	0.5 – 20	0.5 – 20	1 – 20	3 – 20	1 – 20	1 – 20
Cutting edge length (mm)	1 – 26	0.5 – 38	7 – 38	1.5 – 22	1.5 – 22	1.5 – 22	1.5 – 22	3 – 38	8 – 38	3 – 26	3 – 38
Number of cutting edges	2	2	2	3	3	3	3	3	3	3	3
Cooling channels IC											
HSC / HPC / MTC / TPC / PPC	HSC	HSC	HSC	HSC	HSC	HSC	HSC	HSC	HSC	HSC	HSC
Coating	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN
Type of shank	HA/HB	HA/HB	HA/HB	HA/HB	HA/HB	HA/HB	HA/HB	HA	HA/HB	HA/HB	HA/HB
Secondary application to DIN ISO 513	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK
Page	433	433	433	447	447	447	447	449	449	449	450

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Solid carbide milling cutters for machining steels



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Milling cutter type	Ball nose slot drills								Special mills	
DIN >	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	6527	6527	Man. std	Man. std
Hoffmann-Group Code										
Item number	207106 207115	207125 207154	207135	207175 207176	207240/80 207320	207381	207450 207460	207505 207507	208020	208040
Milling cutter type	N	N	N	H	H	N	N	HR	N	N
Application recommendation										Engraving 60°
Size range (Ø mm)	1 – 20	1 – 20	3 – 20	1 – 10	0.1 – 20	3 – 18	3 – 20	5 – 20	0.2 – 10	3 – 6
Cutting edge length (mm)	2 – 26	3 – 26	20 – 75	0.7 – 8.7	0.2 – 26	7 – 26	5 – 26	13 – 38	0.2 – 10	15 – 20
Number of cutting edges	2	2	2	2	2	3	4	3/4	4	1
Cooling channels IC										
HSC / HPC / MTC / TPC / PPC	HSC	HSC	HSC	HSC	HPC	HSC	MTC	HSC		
Coating	(TiAlN)	TiAlN		TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	
Type of shank	HA	HA	HA	HA	HA	HA	HA	HB	HA	HA
Secondary application to DIN ISO 513	NMK	NMK	NMK	MK	MK	MSK	MK	NMK	NMK	NMK
Page	532	532/533	533	534	535	541	542	545	550	554

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Solid carbide milling cutters for machining steels



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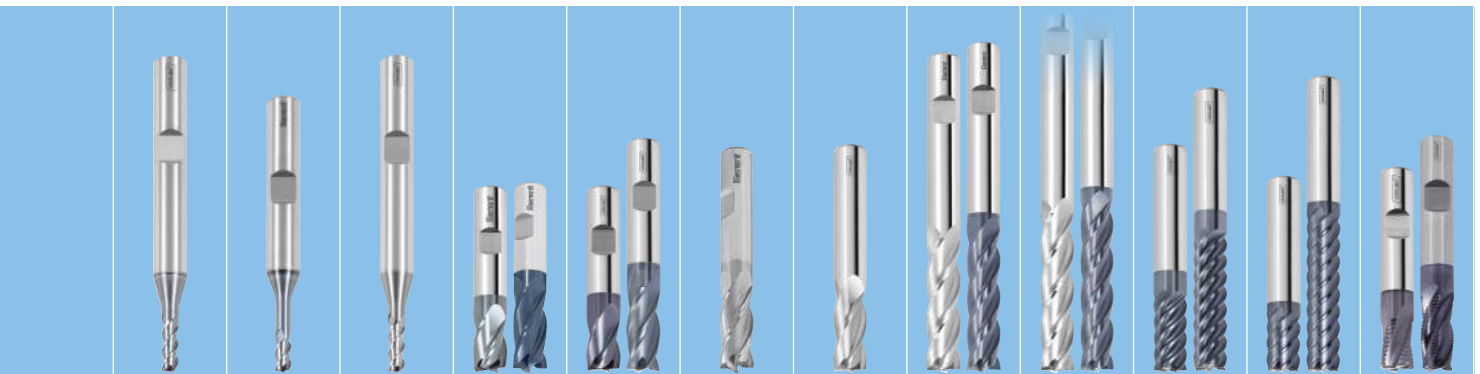
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Milling cutters

Roughing end mills

	6527	6527	6527	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	6527/Man. std	Man. std	6527
	202296	202305	202299 202307	202556 202720/25	202615 202760	202640	202680	202810 202815	202820 202825	203510– 203612	203617– 203620	205486 205492
	N	N	N	N	N	N	N	N	N	N	N	HR
												
	3 – 20	1 – 20	1 – 20	2 – 25	2 – 20	2 – 25	2 – 16	4 – 20	3 – 20	2 – 25	3 – 25	4 – 25
	8 – 38	3 – 26	3 – 38	3 – 50	3 – 41	8 – 50	8 – 35	16 – 60	16 – 80	6.5 – 80	6 – 92	8 – 45
	3	3	3	4	4	4	4	4	4	6/8	6	3/4/5
	HSC	HSC	HSC	HSC	HSC	HSC	HSC	HSC	HSC	HSC	HSC	HPC
	AlCrN	AlCrN	AlCrN	TiAlN	TiAlN	TiAlN	TiAlN	(TiAlN)	(TiAlN)	(TiAlN)	(TiAlN)	(TiAlN)
	HB	HA/HB	HA/HB	HA/HB	HA/HB	HA/HB	HA/HB	HA/HB	HA/HB	HA/HB	HA	HB
	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	H	NMK
	450	451	451	459/460	459/460	459	459	461	461	488	489	498

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Solid carbide milling cutters for machining steels



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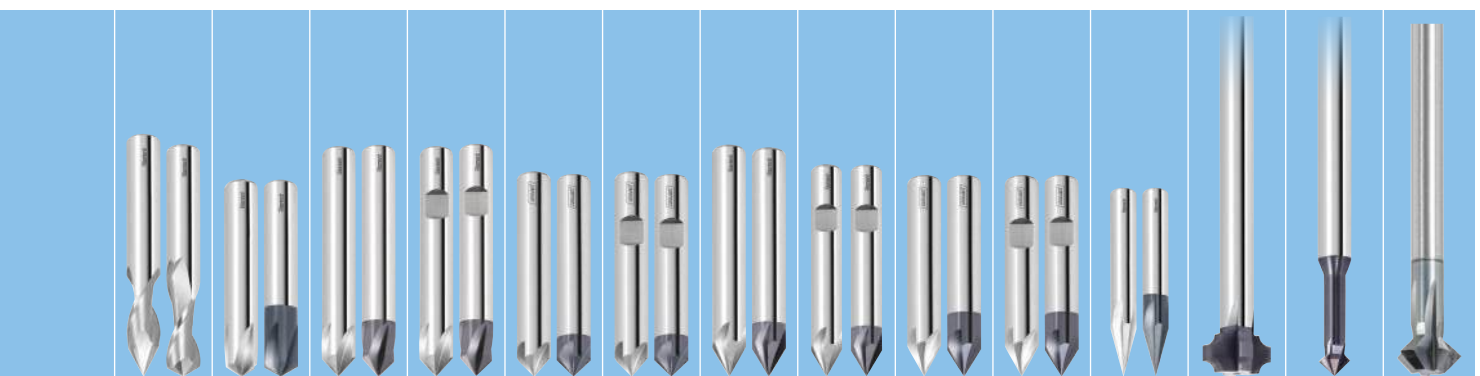
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	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std
	208065 208070/80	208090 208092	208095 208105	208110 208120	208097 208107	208111 208121	208125 208135	208140 208160	208127 208137	208141 208161	208150 208152	208170	208180	208181
	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	60°/ 90°/ 120°	120°	90°	90°	90°	90°	60°	60°	60°	60°	30°			
	3 – 20 8 – 38	1 – 16	1 – 16	6 – 16	1 – 16	6 – 12	1 – 16	6 – 16	1 – 16	6 – 12	1 – 16	0.2 – 2.5	3 – 12	3 – 12
	2	3/4	3/4	4	3/4	4	3/4	4	3/4	4	3/4	4	4	5
		(TiAlN)	(TiAlN)	(TiAlN)	(TiAlN)	(TiAlN)	(TiAlN)	(TiAlN)	(TiAlN)	(TiAlN)	(TiAlN)	TiAlN	TiAlN	TiSiN
	HA	HA	HA	HB	HA	HB	HA	HB	HA	HB	HA	HA	HA	HA
	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMK	NMSK
	554	556	556	557	556	557	557	558	557	558	558	562	562	563

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Solid carbide milling cutters for machining hardened steels



	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	HOLEX	Garant	Garant	
Milling cutter type	Milling cutters													Torus cutters
DIN >	Man. std	6527	Man. std	Man. std	Man. std	Man. std	Man. std	6527	6527/Man. std	Man. std	6527/Man. std	Man. std	Man. std	
	Diabolo micro precision	Diabolo	Diabolo 70	ISO H55			with chip separators	Diabolo HRC 62	Diabolo	Diabolo		Diabolo 70	Diabolo micro precision	
Hoffmann Group Code														
Item number	201631	201639	201648	202970	202976 202977 202979	202978 202982 202981	203079	203221	203211 203282	203372 203382	203246 203248	203212	206155– 206159	
Milling cutter type	H	H	H	H	H	H	H	H	H	H	H	H	H	
Application recommendation														
Size range (Ø mm)	0.1–3	0.5–20	0.5–6	4–20	4–20	4–20	6–20	2–20	2–20	6–25	5–20	2–16	0.2–3	
Cutting edge length (mm)	0.15–4.6	1.5–38	1.3–15	11–41	8–41	16–60	18–60	8–41	8–60	16–75	13–60	6–32	0.2–4.5	
Number of cutting edges	2	2	2	4	4	4	5	4–10	4–10	6–10	6	4/6	2	
HSC / HPC / MTC / TPC / PPC	HSC	HPC	HPC	HPC/TPC	MTC (TPC)	MTC (TPC)	TPC	HPC	HPC	HPC		HPC	HSC	
Coating	TiAlN	TiAlN	TiAlN	TiSiN	TiAlN	TiAlN	TiAlN	TiSiN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	
Type of shank	HA	HA	HA	HA	HB/HA	HB/HA	HB	HA	HA	HA	HA	HA	HA	
Secondary application to DIN ISO 513	PM			P	P	P					P		PM	
Page	434/435	436	436	462	462	463	480	490	490	490	491	491	508/509	

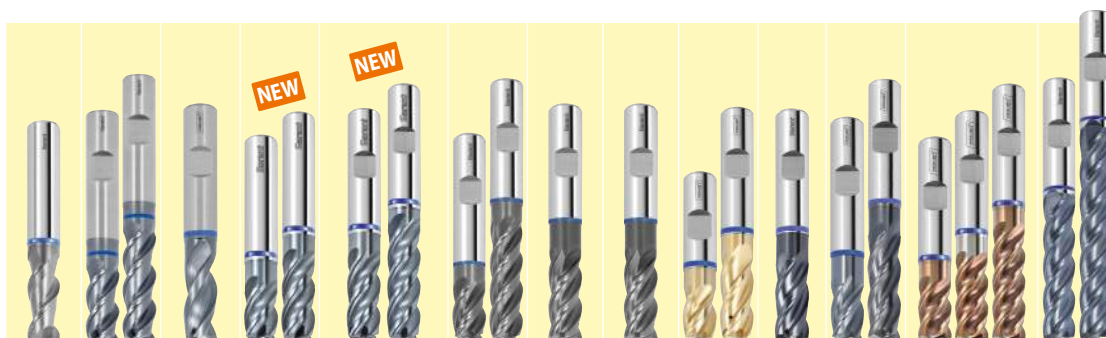
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Solid carbide milling cutters for machining high-alloy steels



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Milling cutter type	Milling cutters													
DIN >	6527	6527/Man. std	Man. std	6527	6527/manufactur- er	6527/Man. std	6527	6527	6527/Man. std	6527	Man. std	6527/Man. std	Man. std	
	GARANT Master INOX	GARANT Master INOX	HOLEX Pro INOX	GARANT INOX	GARANT INOX with chip separators	GARANT Master INOX	GARANT Master INOX	GARANT Master INOX			HOLEX Pro INOX	HOLEX Pro INOX M		
Hoffmann Group Code														
Item number	201647	202387 202389	202378	202950 202952	202954 202956	202998 203006 203007 203011	202997	202999	202995 203014 203017	203016	203013 203015 203021 203027	202991 202994 202996	203023 203024 203026	
Milling cutter type	N	N	N	N	N	N	N	N	N	N	N	N	N	
Application recommendation														
Size range (Ø mm)	1–20	1–20	3–20	0.5–20	4–20	2–25	3–20	4–20	3–20	4–20	3–20	3–20	6–20	
Cutting edge length (mm)	3–38	2.5–60	8–41	1.3–41	11–64	5–60	8–38	11–38	5–60	11–41	5–60	5–60	32–102	
Number of cutting edges	2	3	3	4	4	4	4	4	4	4	4	4	4	
Cooling channels IC									IC	– / – / IC	IC	– / IC		
HSC / HPC / MTC / TPC / PPC	HPC	HPC	HPC	HPC	HPC / TPC	HPC (TPC)	HPC / TPC	HPC/TPC	HPC	HPC	HPC	HPC	HPC (TPC)	
Coating	TiAlN	TiAlN	AlCrN	AlTiN	AlTiN	TiAlN	TiAlN	TiAlN	TiSi	TiAlN	AlCrN	TiSiN	TiAlN	
Type of shank	HA	HB	HB	HA/HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	
Secondary application to DIN ISO 513	P	P	P	P	P	P	P	P	P	PS	P	P	PS	
Page	437	452	452	464	464	465	465	465	466	466	467	468	469	

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Solid carbide milling cutters for machining hardened steels



Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	
Torus cutters								Ball nose slot drills / end mills								PPC milling cutters			Special mills	
Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man.std/6527	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	
Diabolo			Diabolo	Diabolo	Diabolo 70	Diabolo HRC 62	Diabolo	Diabolo HRC 62	Diabolo	Diabolo high precision	Diabolo	Diabolo micro precision	Diabolo	Diabolo	tangential	conical	stub/conical	Diabolo	Diabolo	
206162	206269	206273 206275	206322 206342	206323 206324	206421	206372 206422 206442		207341	207342 207362	207347	207372	207373 207377	207424	207472 207476	207523	207540 207541 207544	207551 207553	208158	208167	
H	N	H	H	H	H	H	H	H	H	H	H	H	H	H	N	N	N	H	H	
0.8 – 12	1 – 12	2 – 16	1 – 16	2 – 12	6 – 16	6 – 20		0.1 – 20	0.1 – 20	0.1 – 6	0.6 – 12	0.1 – 3	3 – 12	2 – 20	6 – 12	6 – 16	12	6 – 16	6 – 16	
1 – 8	1 – 12	1.5 – 8.8	1.5 – 16	2 – 12	7 – 16	7 – 60		0.2 – 26	0.2 – 26	0.1 – 6	0.8 – 11	0.08 – 3.5	8 – 22	4 – 26	14 – 18.5	8.5 – 16	1.7 – 2.5			
2	4/6	2/4	4	4/6	6	6 - 10		2	2	2	2	2	3	4	4/6	4/6	5	6	6	
HSC / HPC	HSC	HPC	HPC	HPC	HPC	HPC	HPC	HPC	HSC / HPC	HSC / HPC	HSC / HPC	HSC	HSC / HPC	HSC / HPC	PPC	PPC	PPC	TiAIN	TiAIN	
TiAIN	AlTiSiN	TiAIN	TiAIN	TiAIN	TiAIN	TiSiN	TiAIN	TiSiN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	
HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	
												PM								
510	516	517	519	521	528	528		536	536/537	537	537	538/539	541	542	547	548	549	560	561	

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Solid carbide milling cutters for machining high-alloy steels



Garant	Garant	Garant	Garant	HOLEX	Garant	Garant	HOLEX	Garant	HOLEX	Garant	HOLEX	Garant	Garant	Garant	Garant
Milling cutters						Roughing end mills		Torus cutters					Ball nose end mills		PPC milling cutters
Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	6527	6527	Man. std	Man. std	Man. std	6527	Man. std	Man. std	Man. std	Man. std
GARANT Master INOX with chip separators					with chip separators	GARANT INOX SlotMachine		HOLEX Pro INOX M	GARANT Master INOX	HOLEX Pro INOX			GARANT Master INOX		conical
203120	203116 203117	203118 203119	203019 203102 203106	203109		205447 205449	205712	206344	206345 206347	206348	206351	206353	207473 207474	207477 207478	207535 207537 207539
N	N	N	N	N		NF	HR	N	N	N	N	N	N	N	N
4 – 20	4 – 20	5 – 20	4 – 20	4 – 20		4 – 20	6 – 20	4 – 16	3 – 20	4 – 20	4 – 20	4 – 20	2 – 20	2 – 20	12 – 16
16 – 60	11 – 60	20 – 100	11 – 60	16 – 60		8 – 41	12 – 40	11 – 36	8 – 38	11 – 41	12 – 38	11 – 41	4 – 26	4 – 26	12.5 – 22
6	6	6	5/7	5		4	4/5	4	4	4	4	4	4	4	6
IC	TPC	TPC	TPC	TPC		HPC	MTC	HPC	HPC	HPC	HPC	HPC	HPC	HPC	PPC
TiAlN	TiAlN	TiAlN	TiAlN	TiAlN		AlTiN	TiAlN	TiSiN	TiAlN	AlCrN	TiAlN	TiSi	TiAlN	TiAlN	TiAlN
HB	HB	HB	HB	HB		HB	HB	HB	HA/HB	HB	HA	HB	HA	HA	HA
P	P	P	P	P		P	P	P	P	P	P	P	P	P	NS
484	484	484	480/485	485		497	502	522	523	523	524	524	543	543	548

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Solid carbide milling cutters for machining titanium and superalloys



	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant
Milling cutter type	Milling cutters					Roughing end mills	Torus cutters				
DIN >	Man. std	6527	6527	6527	6527	6527	Man. std	Man. std	6527	6527	Man. std
	GARANT Master Titan	GARANT Master Titan	GARANT Master Ni-Based	GARANT Master Titan	GARANT Master Ni-Based		GARANT Master Titan	GARANT Master Titan	GARANT Master Titan	GARANT Master Ni-Based	GARANT Master Ni-Based
Hoffmann Group Code											
Item number	202287	203029	203048	203157	203161	205711	206286	206288	206364	206371	206373
Milling cutter type	N	N	N	N	N	HR	N	N	N	N	N
Application recommendation											
Size range (Ø mm)	0.2 – 12	3 – 20	3 – 16	4 – 20	3 – 16	6 – 25	2 – 12	2 – 12	4 – 20	4 – 20	6 – 16
Cutting edge length (mm)	0.6 – 16	8 – 41	8 – 36	11 – 41	8 – 36	12 – 50	1.5 – 6.8	1.5 – 6.8	11 – 41	11 – 41	19 – 49
Number of cutting edges	2-4	4	4	5	5	4/5	2/4/5	2/4/5	4	4/5	6/8
Cooling channels IC											
HSC / HPC / MTC / TPC / PPC	HPC	HPC	HPC / TPC	HPC / TPC	HPC / TPC	MTC	HPC	HPC	HPC	HPC / TPC	HPC
Coating	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
Type of shank	HA	HA	HB	HA	HB	HB	HA	HA	HA	HB	HA
Secondary application to DIN ISO 513						PK					
Page	448	469	469	481	481	502	517	517	525	525	525

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Solid carbide milling cutters for general-purpose machining



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	Milling cutters											
DIN >	Man. std	6527	6527	Man. std	Man. std	Man. std	6527	6527	6527/Man. std	6527/Man. std	Man. std	Man. std
	HOLEX Pro UNI	GARANT Master Steel	GARANT Master Steel	GARANT Master Steel	GARANT Master Steel	GARANT GreenPlus	GARANT Steel	GARANT Steel with chip dividers		HOLEX Pro Steel	HOLEX Pro Steel	HOLEX Pro Steel
Hoffmann Group Code												
Item number	202432	203034	203035 203039	203036	203038	203055	203053 203057	203049	203037 203044/47	203052 203054	203056 203058	203059
Milling cutter type	N	N	N	N	N	N	N	N	N	N	N	N
Application recommendation												
Size range (Ø mm)	1 – 20	3 – 20	3 – 25	6 – 20	6 – 20	3 – 20	3 – 25	6 – 25	3 – 25	3 – 25	5 – 20	6 – 20
Cutting edge length (mm)	2.5 – 41	6 – 26	8 – 68	13 – 41	13 – 41	8 – 41	6 – 68	13 – 68	8 – 68	6 – 45	13 – 60	22 – 68
Number of cutting edges	3	4	4	4	4	4	4	4	4	4	4	4
Cooling channels IC												
HSC / HPC / MTC / TPC / PPC	HPC	HPC	HPC	HPC	HPC	HPC	HPC	HPC	HPC	HPC	HPC	HPC
Coating	TiSiN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiSiN	TiAlN	TiAlN	TiAlN
Type of shank	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HA
Secondary application to DIN ISO 513	PMK	PMK	PMK	PMK	PMK	PMK	PMK	PMK	PMK	PMK	PMK	PMK
Page	456	470	470	470	470	471	472	472	473/474	473	474	474

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Solid carbide milling cutters for general-purpose machining



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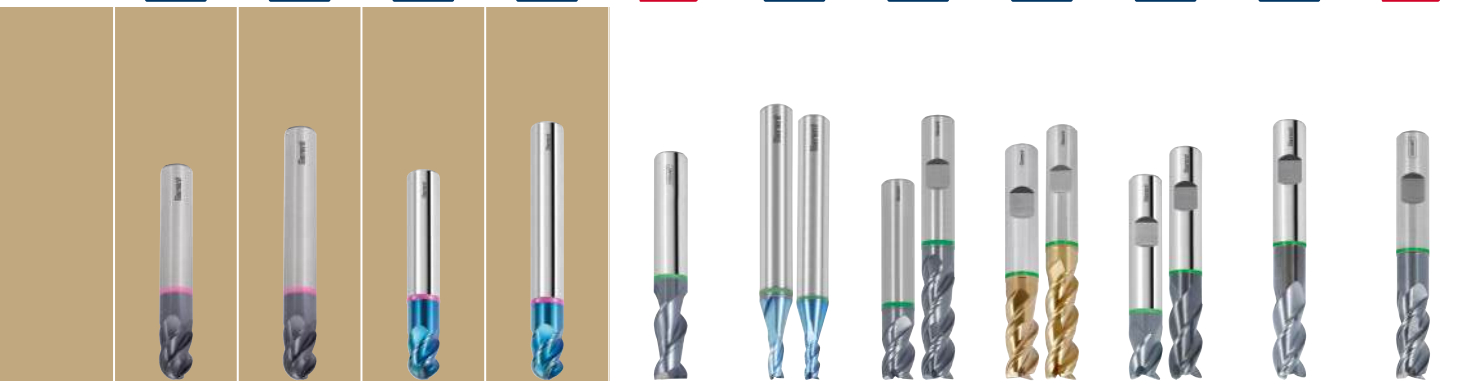
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Ball nose end mills

Milling cutters

Man. std	Man. std	Man. std	Man. std	6527	Man. std	6527/Man. std	6527/Man. std	6527	Man. std	Man. std
		GARANT Master Titan	GARANT Master Titan		GARANT Master Steel			GARANT Master Steel PickPocket	GARANT Master Steel PickPocket	HOLEX Pro Steel
207480	207485	207482	207487	201650	202289 202295	202391 202396/99	202392 202394	202402 202404	202406	202414 202416
N	N	N	N	N	N	N	N	N	N	N
2-12	2-12	1-12	1-12	3-20	0.2-16	1-20	1-20	3.8-20	5.7-20	3-20
4-16	4-16	2-16	2-16	8-38	0.6-18	2.5-60	2.5-60	5-41	13-41	8-38
4	4	4	4	2	3	3	3	3	3	3
HPC	HPC	HPC	HPC		HPC	MTC	MTC	HPC	HPC	HPC
TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	AlCrN	SiTiN	TiAlN	TiAlN	TiAlN
HA	HA	HA	HA	HA	HA	HB	HB	HB	HB	HB
				NPMK	NPMK	PMK	PMK	PMK	PMK	PMK
544	544	544	544	437	448	453	453	454	454	455

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Solid carbide milling cutters for general-purpose machining



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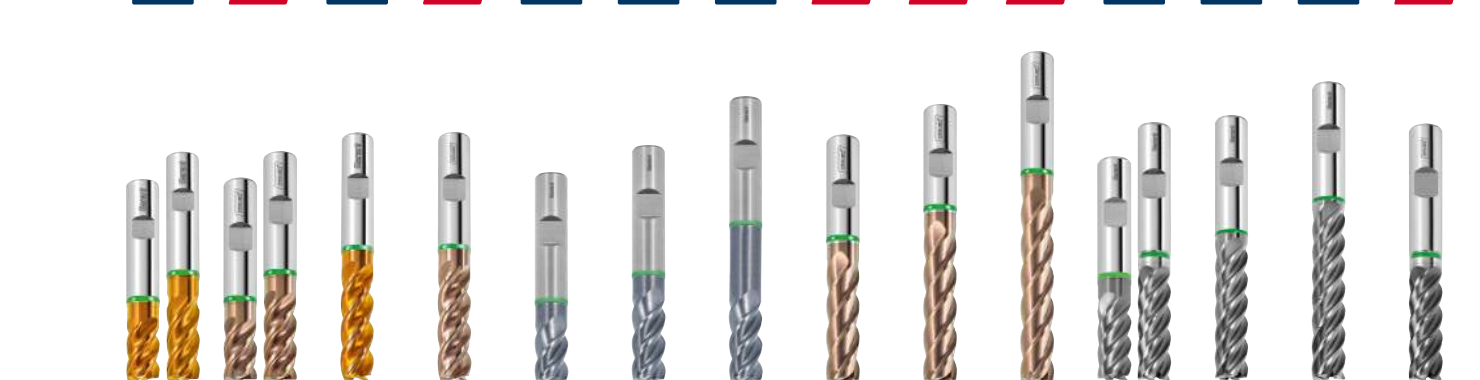
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Milling cutters

6527	6527	6527	6527	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std
GARANT Master UNI	HOLEX Pro UNI	GARANT Master UNI	HOLEX Pro UNI								with chip separators	with chip separators	with chip separators	with chip separators
203062 203067	203063 203068	203073	203074	203051	203061 203076	203071	203085	203086	203087	203088/ 203092	203093	203094	203095	
N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3-25	3-25	6-16	6-16	3-20	3-20	6-20	4-20	5-20	8-20	4-20	5-20	8-20	4-20	
5-68	8-68	18-48	18-48	5-26	8-41	13-41	16-60	20-80	40-100	11-60	20-80	40-100	16-60	
4	4	4	4	4	4	4	4	4	4	5	5	5	5	
HPC	HPC	HPC	HPC	MTC	MTC	MTC	TPC	TPC	TPC	TPC	TPC	TPC	TPC	TPC
TiSiN	TiSiN	TiSiN	TiSiN	AlCrN	AlCrN	AlCrN	TiSiN	TiSiN	TiSiN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB
NPMK	NPMK	NPMK	NPMK	PMK	PMK	PMK	PM	PM	PM	PMK	PMK	PMK	PMK	PMK
475	476	475	476	477	477	477	479	479	479	482/483	483	483	483	

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Solid carbide milling cutters for general-purpose machining



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Milling cutter type	Milling cutters					Roughing end mills					
DIN >	Man. std	6527	Man. std	Man. std	Man. std	6527	6527	6527	6527	6527	6527
	HOLEX Pro Steel		high precision	GARANT Master Steel	GARANT Master Steel				GARANT Master Steel SlotMachine	GARANT Master Steel SlotMachine	GARANT Master Steel SlotMachine
Hoffmann Group Code											
Item number	203623 203624	203440 203480	203530 203540	204012/14 204015	204016/18 204019	205482 205490	205488 205592	205710	205548	205550	205551
Milling cutter type	N	N	N	N	N	HR	HR	HR	NR	NR	NR
Application recommendation											
Size range (Ø mm)	4 – 20	5 – 20	6 – 25	4 – 20	6 – 20	4 – 25	8 – 20	6 – 20	4 – 20	4 – 20	4 – 20
Cutting edge length (mm)	16 – 80	13 – 38	13 – 105	11 – 60	24 – 100	8 – 45	11 – 38	8 – 20	8 – 26	11 – 38	11 – 38
Number of cutting edges	6	6/8	6/8	7	7	3/4/5	3/4	4/5	5	5	5
Cooling channels IC							IC				IC
HSC / HPC / MTC / TPC / PPC	HPC	HSC	HSC	HPC	HPC	HPC	HPC	MTC	HPC	HPC	HPC
Coating	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
Type of shank	HA	HA/HB	HA	HA	HA	HB	HB	HB	HB	HB	HB
Secondary application to DIN ISO 513	PMK	NPMK	PMK	PMK	PMK	NPMK	NPMK	PMSK	PMK	PMK	PMK
Page	488	492	492	493	493	498	499	499	500	500	500

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Solid carbide milling cutters for general-purpose machining



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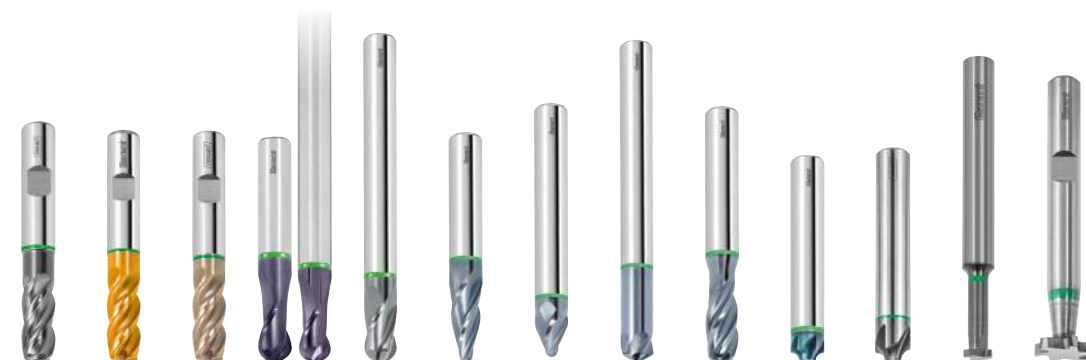
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Milling cutter type	Torus cutters			Ball nose slot drills/end mills		PPC milling cutters				Special mills			
DIN >	6527	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	850 D/F
	HOLEX Pro Steel	GARANT Master UNI	HOLEX Pro UNI	GARANT Master Steel	GARANT Master Steel	tangential	conical	stub/conical	straight				
Hoffmann Group Code													
Item number	206357	206367	206368	207242 207244/46	207490 207492	207525	207530– 207534	207543– 207549	207520	208021 208023	208022	208033	208024
Milling cutter type	N	N	N	N	N	N	N	N	N	N	N	N	N/NF
Application recommendation													
Size range (Ø mm)	4 – 20	4 – 16	4 – 16	0.1 – 20	2 – 20	6 – 12	6 – 16	8 – 12	10 – 12	0.2 – 10	0.5 – 5	5.8 – 7.8	10.5 – 45.5
Cutting edge length (mm)	11 – 38	11 – 36	11 – 36	0.2 – 26	4 – 26	20.5 – 27	8 – 22	1.4 – 3.5	21.5 – 23			0.5 – 2.0	2 – 10
Number of cutting edges	4	4	4	2	4	4	4	3/5	5	3/4/5/6	4	3	6/8/10
Cooling channels IC													
HSC / HPC / MTC / TPC / PPC	HPC	HPC	HPC	HPC	HPC	PPC	PPC	PPC	PPC	HPC			
Coating	TiAlN	TiSiN	TiSiN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiSiN	AlTiN	TiAlN
Type of shank	HB	HB	HB	HA	HA	HA	HA	HA	HA	HA	HA	HA	HB
Secondary application to DIN ISO 513	PMK	NPMSK	NPMSK	PMK	PMK	NPMK	NPMK	NPMK	NPMK	NPM	NPMK	NPMK	PM
Page	526	527	527	540	545	547	548	549	549	550	550	551	552

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Solid carbide milling cutters for general-purpose machining



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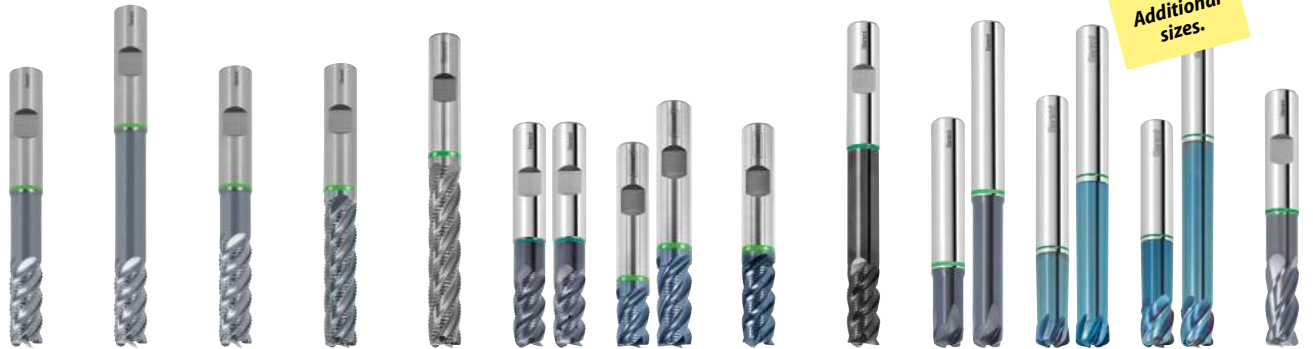
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Additional sizes.

Roughing end mills										Torus cutters			
Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	6527	6527	6527	Man. std	Man. std	Man. std	Man. std	6527/Man. std
GARANT Master Steel SlotMachine	GARANT Master Steel SlotMachine	GARANT Master Steel SlotMachine	GARANT Master Steel SlotMachine	GARANT Master Steel SlotMachine	GARANT Master Steel SlotMachine		HOLEX Pro Steel					GARANT Master Steel	GARANT Master Steel
205552	205556	205554	205555	205557	205714 205716	205704 205706		205715	205718	206266 206267	206262 206263	206333 206335	206354 206359
NR	NR	NR	NR	NR	HR	HR		HR	HR	N	N	H	N
5-20	6-20	5-20	6-20	8-16	6-25	4-20		6-25	6-20	2-16	2-12	1-16	4-20
13-41	13-41	17-60	24-80	40-80	12-50	6-38		13-50	12-40	1.5-8.8	1.5-6.8	1.5-16	11-41
5	5	5	5	5	4/5	4/5/6		4/5/6	4/5	2/4	3/5/6	4/5/6	4
HPC	HPC	HPC/TPC	HPC/TPC	HPC/TPC	MTC	HPC		MTC	MTC	HPC	HPC	HPC	HPC
TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN		TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN
HB	HB	HB	HB	HB	HB	HB		HB	HB	HA	HA	HA	HB
PMK	PMK	PMK	PMK	PMK	PMK	PMK		PMK	PMK	PM	PM	PMK	PMK
500	501	501	501	501	502	503		503	503	518	518	520	526

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Solid carbide milling cutters for general-purpose machining



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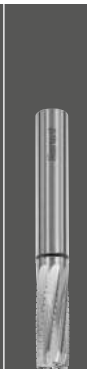
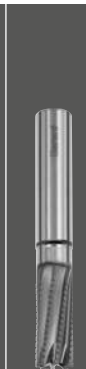
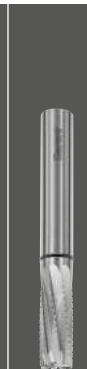
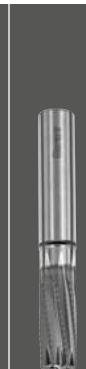
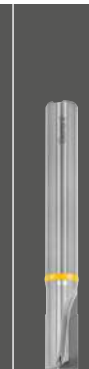
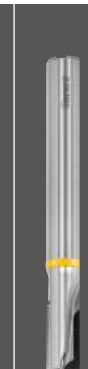
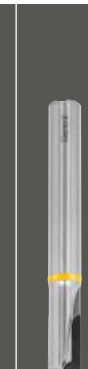
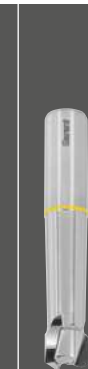
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Special mills															
851	851	1833	1833	1833	1833	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std
208026	208027	208028	208029	208030	208031	208086	208087	208088	208089	208156	208162 208164	208166 208168	208165	208172	208185
N	N/F	N	N	N	N	N	N	N	N	N	N	N	N	N	N
		45°	45°	60°	60°	60°	60°	90°	120°	90°	90°	60°	60°		
12.5-32	12.5-32	12-38	12-38	12-38	12-38	3-6	3-12	3-20	3-12	6-16	6-20	6-20	6-16	0.2-2.5	7.8-12
6-14	6-14	3-10	3-10	5-16	5-16	15-20	8-26	8-38	8-26						
6	6	6/8/10	6/8/9	6/8/9	6/8/10	2	2	2	2	4	6/8	6/8	4	5	5
TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	TiAIN	(TiAIN)	(TiAIN)	TiAIN	TiAIN	TiAIN
HB	HB	HB	HB	HB	HB	HA	HA	HA	HA	HA	HB	HB	HA	HA	HA
P	P	P	P	P	P	NPMK	NPMK	NPMK	NPMK	NPMK	NPMK	NPMK	NPMK	NPMK	NPMK
552	553	553	553	553	553	555	555	555	555	559	560	561	561	562	562

Garant Solid carbide milling cutters for machining non-metallic materials


	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant
												
Milling cutter type	Milling cutters		Router	Milling cutters					Milling cutters			
DIN >	Man. std	Man. std	Man. std	Man. std	6527	6527	6527	6527	Man. std	Man. std	Man. std	Man. std
			fine		Composite	Composite	Composite	Composite	straight cut	dragging cut	compacting cut	
Hoffmann Group code												
Article number	209300 209305	209320 209322	209512	209515 209517	209540	209546	209542	209548	209800	209801	209802	209808
Milling cutter type	W	W										N
Application recommendation												
Size range (Ø mm)	1.5 – 12	4 – 20	4 – 20	6 – 12	4 – 16	4 – 16	4 – 16	4 – 16	3 – 16	3 – 16	3 – 16	16 – 20
Cutting edge length (mm)	6 – 30	13 – 41	16 – 45	16 – 36	11 – 32	11 – 32	11 – 32	11 – 32	2.5 – 20	2.5 – 20	2.5 – 20	11.4 – 14.2
Number of cutting edges	1	2/3		4/6	8	8	8	8	2	2	2	3
Coolant channels IC									IC	IC	IC	IC
HSC / HPC / MTC / TPC / PPC												HPC
Coating			Diamond	Diamond		Diamond		Diamond	PCD	PCD	PCD	PCD
Type of shank	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Secondary application to DIN ISO 513	N	N							N	N	N	N
Page	564	564	565	565	567	567	567	567	568	568	568	569

Garant Solid carbide milling cutters for machining non-metallic materials


	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant
Milling cutter type	Torus cutter	Radius Milling Tool	Face mill	Milling cutters			Torus cutters			Radius Milling Tools	
DIN >	Man. std	Man. std		Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std	Man. std
	straight cut	straight cut		Micro precision			Micro precision				Micro precision
Hoffmann Group code											
Article number	209804	209806	209810	209700	209711	209713	209714– 209731	209755/ 209758	209760	209776/ 209781	209791
Milling cutter type											
Application recommendation											
Size range (Ø mm)	3 – 10	3 – 16	50 – 63	0.1 – 3	3 – 20	6 – 20	0.2 – 3	3 – 12	4 – 12	1 – 20	0.2 – 3
Cutting edge length (mm)	2.5 – 8	2.5 – 10		0.15 – 4.5	8 – 38	13 – 38	0.2 – 4.5	4 – 12	5 – 12	2 – 26	0.16 – 3.5
Number of cutting edges	2	2	5/6	2	2	4	2	4	4	2	2
Coolant channels IC	IC	IC	IC								
HSC / HPC / MTC / TPC / PPC											
Coating	PCD	PCD	PCD	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond
Type of shank	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Secondary application to DIN ISO 513	N	N	N								
Page	568	569	570	570/571	572	572	573/574	575	576	576	577/578

REGRINDING: GOOD FOR YOU AND GOOD FOR THE ENVIRONMENT.

With our regrinding service, you save money and resources.



Hoffmann Group

Regrinding service



Good for you

It is already worth it from the first regrind. Overall, you can expect amazing savings of up to 85%. And all with the original regrind quality, to the original geometry and on the original production machines. There are no compromises here. **In addition:** Of course, we also provide you with excellent regrinding results for your third-party brands!

Good for the environment

Reusing the tool saves valuable resources and avoids unnecessary waste. In addition, the shorter transport distances also ensure a reduced CO₂ footprint. A good contribution to environmental protection.

Just good all round

Pick-up and delivery service, coating service, measurement certificate service, labelling service. **An all-round worry-free package has never been so easy – and with maximum cost transparency.** For you, this means the highest precision and reliability as quickly as possible.



“The efficiency and quality of the reconditioned tools due to the original regrind quality surprised me very positively!”
Marin Engelsberger, Bacher GmbH



Further information on the regrinding service:
Discover all about our services
online now.
<https://hog.tools/regrinding>



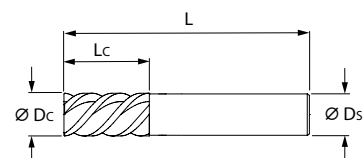
Garant Solid carbide slot drill

Large flute section for unobstructed swarf evacuation.

Special geometry for aluminium machining.

20 1045/1046 – With the latest generation of **DLC coating** sp².

Application: Especially for milling **aluminium, plunging** and **contour milling**.



20 1040



20 1043



20 1045



20 1046

Suitable for/ v _c [m/min]	Alu wavy	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey- comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 1040	180	140	105	180	130	150	130	110							180	140	180					
20 1043	170	125	100	170	120	140	120	100							170	130	160					
20 1045	480	440	400	200	160	200	150	130	180	160	150	130	160		300	160	200					
20 1046	440	400	360	180	150	180	140	120	170	150	140	120	150		280	150	190					

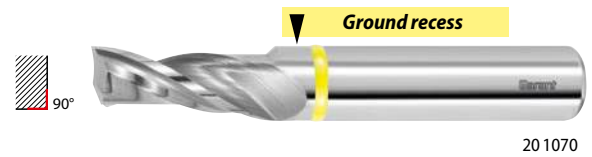
Ø h10 D _c	11X	20 1040	11X	20 1043	L _c		L		Ø D _s		
		Solid carbide slot drill									
					20 1040	20 1043	20 1040	20 1043			
mm					mm	mm	mm	mm	mm		mm
1		–		eShop	–	8	–	75	3		0.004
1,5		eShop		eShop	6	12	50	75	3		0.004
2		eShop		eShop	8	18	50	75	3		0.008
3		eShop		eShop	12	22	50	75	3		0.008
4		eShop		eShop	15	25	60	75	4		0.015
5		eShop		eShop	17	25	60	75	5		0.015
6		eShop		eShop	20	30	65	100	6		0.025
8		eShop		eShop	22	35	64	100	8		0.03
10		eShop		eShop	25	40	75	100	10		0.04
12		eShop		eShop	30	45	80	120	12		0.05

Ø h10 D _c	11X	20 1045	11X	20 1046	L _c		L		Ø D _s		
		Solid carbide slot drill									
					20 1045	20 1046	20 1045	20 1046			
mm		DLC	DLC		mm	mm	mm	mm	mm		mm
1		eShop	eShop		4	8	50	75	3		0.004
1,5		eShop	eShop		6	12	50	75	3		0.004
2		eShop	eShop		8	18	50	75	3		0.008
3		eShop	eShop		12	22	50	75	3		0.008
4		eShop	eShop		15	25	60	75	4		0.015
5		eShop	eShop		17	25	60	75	5		0.015
6		eShop	eShop		20	30	65	100	6		0.025
8		eShop	eShop		22	35	64	100	8		0.03
10		eShop	eShop		25	40	75	100	10		0.04
12		eShop	eShop		30	45	80	120	12		0.05

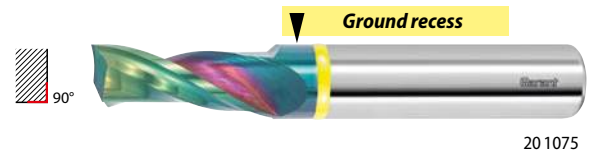


Garant GARANT Master Alu solid carbide slot drill HPC

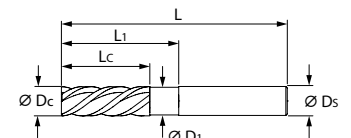
Precision balanced tools, ideally suited for use on **high-speed spindles**.
Special geometry for optimum chip evacuation thanks to **newly developed balancing process**.
Very smooth cutting action for **outstanding surface quality**.



20 1070



20 1075



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey- comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 1070	180	140	105	180	130	150	130	110								180	140	180					
20 1075	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200					

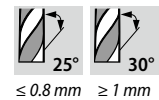
Ø e8 D _c	11Z	20 1070	11Z	20 1075	L _c	L ₁	Ø D ₁	L	Ø D _s	f _z	f _z
		GARANT Master Alu solid carbide slot drill									
		HPC									
mm			DLC		mm	mm	mm	mm	mm	mm	mm
2M	eShop		eShop		5	—	—	50	6	0.02	0.04
2L	eShop		eShop		11	—	—	50	6	0.02	0.04
3M	eShop		eShop		6	9	2.8	50	6	0.03	0.05
3L	eShop		eShop		12	16	2.8	50	6	0.03	0.05
4M	eShop		eShop		10	16	3.8	50	6	0.04	0.06
4L	eShop		eShop		16	21	3.8	55	6	0.04	0.06
5E	eShop		eShop		9	14	4.8	50	6	0.05	0.07
5M	eShop		eShop		16	21	4.8	55	6	0.05	0.07
6E	eShop		eShop		11	17	5.5	50	6	0.06	0.08
6L	eShop		eShop		16	24	5.5	50	6	0.06	0.08
6X	eShop		eShop		21	27	5.5	55	6	0.06	0.08
8K	eShop		eShop		8	13	7.4	50	8	0.08	0.1
8E	eShop		eShop		14	26	7.4	60	8	0.08	0.1
8D	eShop		eShop		14	43	7.4	70	8	0.07	0.09
8S	eShop		eShop		21	31	7.4	60	8	0.08	0.1
8T	eShop		eShop		26	34	7.4	70	8	0.07	0.09
8X	eShop		eShop		31	43	7.4	70	8	0.07	0.09
10D	eShop		eShop		10	16	9.2	55	10	0.1	0.12
10E	eShop		eShop		18	28	9.2	60	10	0.1	0.12
10S	eShop		eShop		18	52	9.2	80	10	0.08	0.1
10L	eShop		eShop		26	34	9.2	60	10	0.1	0.12
10M	eShop		eShop		26	34	9.2	85	10	0.08	0.1
10X	eShop		eShop		33	43	9.2	70	10	0.09	0.11
12K	eShop		eShop		12	19	11	60	12	0.12	0.14
12E	eShop		eShop		21	33	11	70	12	0.1	0.12
12L	eShop		eShop		32	42	11	70	12	0.1	0.12

Garant GARANT Master Alu solid carbide slot drill HPC



Advantages of precision balanced GARANT Master Alu solid carbide slot drills

- Low-vibration milling, particularly at high speeds.
- Significant lengthening of the machine spindle life cycle.
- Significantly longer working life of the tool.
- Improved surface quality of the workpiece.



Garant Solid carbide precision micro slot drill

With **advanced DLC sp² coating**.

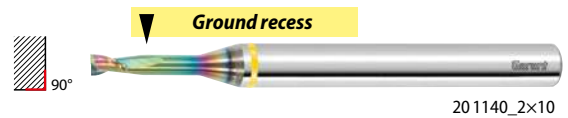
For the **highest demands regarding performance and precision in aluminium materials**. **Extremely tight tolerances** ensure maximum accuracy.

Double relief ground with 2 hollow-ground chamfers. **Recess angle $\alpha = 16^\circ$** .

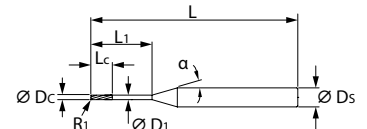
Tolerances:

■ Neck $\varnothing$: $D_1 = 0 / -0.01$ mm.

Note: At greater tool overhang lengths, use a reduced value for a_p !
 Values for:
 slots milled from solid: $a_p = 0.25 \times D \times a_{p \text{ corr}}$
 side milling: $a_p = 0.5 \times D \times a_{p \text{ corr}}$
To calculate the feed rate v_f please use the actual speed of the machine (the maximum possible speed)!
 e.g: $v_f = 18000 \text{ [rpm]} \times f_z \text{ [mm/Z]} \times z$

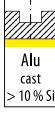


20 1140_2x10



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
	cast	cast	cast													sandwich							
	> 10 % Si	> 10 % Si	> 10 % Si																				
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 1140	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200					

$\varnothing D_c \times L_1$	20 1140	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z	f_z	Correction factor $a_{p \text{ corr}}$
	Solid carbide micro slot drill								
	DLC								
mm		mm	mm	mm	mm	mm	mm	mm	
0,1x0,3	eShop	0.15	0.3	0.08	45	4	0.008	0.012	1
0,1x0,5	eShop	0.15	0.5	0.08	45	4	0.008	0.012	1
0,1x1	eShop	0.15	1	0.08	45	4	0.005	0.007	0.5
0,2x0,5	eShop	0.3	0.5	0.18	45	4	0.008	0.012	1
0,2x1	eShop	0.3	1	0.18	45	4	0.008	0.012	1
0,2x2	eShop	0.3	2	0.18	45	4	0.005	0.007	0.5
0,2x3	eShop	0.3	3	0.18	45	4	0.005	0.007	0.2
0,3x0,5	eShop	0.4	0.5	0.28	45	4	0.012	0.016	1
0,3x1	eShop	0.4	1	0.28	45	4	0.012	0.016	1
0,3x2	eShop	0.4	2	0.28	45	4	0.012	0.016	0.9
0,3x3	eShop	0.4	3	0.28	45	4	0.008	0.012	0.5
0,3x4	eShop	0.4	4	0.28	45	4	0.008	0.012	0.35
0,3x6	eShop	0.4	6	0.28	45	4	0.005	0.007	0.08
0,4x1	eShop	0.6	1	0.38	45	4	0.012	0.016	1
0,4x2	eShop	0.6	2	0.38	45	4	0.012	0.016	1
0,4x3	eShop	0.6	3	0.38	45	4	0.012	0.016	0.8
0,4x4	eShop	0.6	4	0.38	45	4	0.008	0.012	0.5
0,4x6	eShop	0.6	6	0.38	45	4	0.008	0.012	0.2
0,4x8	eShop	0.6	8	0.38	45	4	0.005	0.007	0.08
0,5x1	eShop	0.7	1	0.48	45	4	0.016	0.02	1
0,5x2	eShop	0.7	2	0.48	45	4	0.016	0.02	1
0,5x3	eShop	0.7	3	0.48	45	4	0.016	0.02	0.9
0,5x4	eShop	0.7	4	0.48	45	4	0.016	0.02	0.8
0,5x6	eShop	0.7	6	0.48	45	4	0.012	0.016	0.35
0,5x8	eShop	0.7	8	0.48	45	4	0.012	0.016	0.12
0,5x10	eShop	0.7	10	0.48	50	4	0.008	0.012	0.08
0,6x2	eShop	0.9	2	0.58	45	4	0.016	0.02	1
0,6x3	eShop	0.9	3	0.58	45	4	0.016	0.02	1
0,6x4	eShop	0.9	4	0.58	45	4	0.016	0.02	0.9
0,6x6	eShop	0.9	6	0.58	45	4	0.012	0.016	0.5
0,6x8	eShop	0.9	8	0.58	45	4	0.012	0.016	0.35
0,6x10	eShop	0.9	10	0.58	50	4	0.012	0.016	0.12
0,8x2	eShop	1.2	2	0.78	45	4	0.016	0.02	1
0,8x3	eShop	1.2	3	0.78	45	4	0.016	0.02	1
0,8x4	eShop	1.2	4	0.78	45	4	0.016	0.02	1
0,8x6	eShop	1.2	6	0.78	45	4	0.016	0.02	0.8
0,8x8	eShop	1.2	8	0.78	45	4	0.012	0.016	0.8
0,8x10	eShop	1.2	10	0.78	50	4	0.012	0.016	0.35
0,8x12	eShop	1.2	12	0.78	50	4	0.012	0.016	0.2
1x2	eShop	1.5	2	0.95	45	4	0.025	0.03	1
1x3	eShop	1.5	3	0.95	45	4	0.025	0.03	1

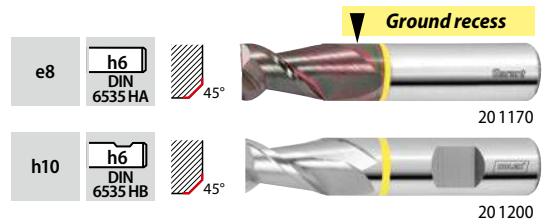
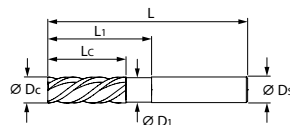
$\varnothing D_c \times L_1$	11X	20 1140	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$			Correction factor $a_{p\text{ corr}}$
mm		Solid carbide micro slot drill	mm	mm	mm	mm	mm	f_z mm	f_z mm	
1x4		eShop	1.5	4	0.95	45	4	0.025	0.03	1
1x5		eShop	1.5	5	0.95	45	4	0.025	0.03	1
1x6		eShop	1.5	6	0.95	45	4	0.025	0.03	0.9
1x8		eShop	1.5	8	0.95	45	4	0.025	0.03	0.8
1x10		eShop	1.5	10	0.95	45	4	0.02	0.025	0.5
1x12		eShop	1.5	12	0.95	50	4	0.02	0.025	0.35
1x14		eShop	1.5	14	0.95	50	4	0.02	0.025	0.3
1x15		eShop	1.5	15	0.95	50	4	0.02	0.025	0.2
1x16		eShop	1.5	16	0.95	50	4	0.02	0.025	0.1
1x20		eShop	1.5	20	0.95	60	4	0.016	0.02	0.08
1x25		eShop	1.5	25	0.95	60	4	0.016	0.02	0.04
1x30		eShop	1.5	30	0.95	70	4	0.012	0.016	0.02
1,2x3		eShop	1.8	3	1.14	45	4	0.025	0.03	1
1,2x4		eShop	1.8	4	1.14	45	4	0.025	0.03	1
1,2x6		eShop	1.8	6	1.14	45	4	0.025	0.03	1
1,2x8		eShop	1.8	8	1.14	45	4	0.025	0.03	0.9
1,2x10		eShop	1.8	10	1.14	45	4	0.025	0.03	0.8
1,2x12		eShop	1.8	12	1.14	50	4	0.02	0.025	0.5
1,2x15		eShop	1.8	15	1.14	50	4	0.02	0.025	0.35
1,2x20		eShop	1.8	20	1.14	60	4	0.02	0.025	0.12
1,4x6		eShop	1.8	6	1.34	45	4	0.025	0.03	0.8
1,5x3		eShop	2.3	3	1.44	45	4	0.025	0.03	1
1,5x4		eShop	2.3	4	1.44	45	4	0.025	0.03	1
1,5x6		eShop	2.3	6	1.44	45	4	0.025	0.03	1
1,5x8		eShop	2.3	8	1.44	45	4	0.025	0.03	1
1,5x10		eShop	2.3	10	1.44	45	4	0.025	0.03	0.9
1,5x12		eShop	2.3	12	1.44	50	4	0.025	0.03	0.8
1,5x14		eShop	2.3	14	1.44	50	4	0.025	0.03	0.6
1,5x15		eShop	2.3	15	1.44	50	4	0.02	0.025	0.5
1,5x16		eShop	2.3	16	1.44	50	4	0.02	0.025	0.4
1,5x20		eShop	2.3	20	1.44	60	4	0.02	0.025	0.35
1,5x25		eShop	2.3	25	1.44	60	4	0.02	0.025	0.12
1,5x30		eShop	2.3	30	1.44	70	4	0.016	0.02	0.08
1,8x6		eShop	2.7	6	1.71	45	4	0.03	0.035	1
1,8x8		eShop	2.7	8	1.71	45	4	0.03	0.035	1
1,8x10		eShop	2.7	10	1.71	45	4	0.03	0.035	0.9
1,8x12		eShop	2.7	12	1.71	50	4	0.03	0.035	0.9
1,8x15		eShop	2.7	15	1.71	50	4	0.03	0.035	0.8
1,8x20		eShop	2.7	20	1.71	60	4	0.025	0.03	0.5
2x4		eShop	3	4	1.91	45	4	0.03	0.035	1
2x6		eShop	3	6	1.91	45	4	0.03	0.035	1
2x8		eShop	3	8	1.91	45	4	0.03	0.035	1
2x10		eShop	3	10	1.91	45	4	0.03	0.035	1
2x12		eShop	3	12	1.91	50	4	0.03	0.035	0.9
2x14		eShop	3	14	1.91	50	4	0.03	0.035	0.8
2x15		eShop	3	15	1.91	50	4	0.03	0.035	0.8
2x16		eShop	3	16	1.91	50	4	0.03	0.035	0.7
2x20		eShop	3	20	1.91	60	4	0.025	0.03	0.5
2x25		eShop	3	25	1.91	60	4	0.025	0.03	0.35
2x30		eShop	3	30	1.91	70	4	0.025	0.03	0.2
2x35		eShop	3	35	1.91	80	4	0.02	0.025	0.08
2x40		eShop	3	40	1.91	80	4	0.02	0.025	0.08
2,5x8		eShop	3.7	8	2.41	50	4	0.035	0.04	1
2,5x12		eShop	3.7	12	2.41	50	4	0.03	0.035	0.9
2,5x15		eShop	3.7	15	2.41	50	4	0.03	0.035	0.9
2,5x16		eShop	3.7	16	2.41	50	4	0.03	0.035	0.8
2,5x20		eShop	3.7	20	2.41	60	4	0.03	0.035	0.8
2,5x25		eShop	3.7	25	2.41	60	4	0.025	0.03	0.5
2,5x30		eShop	3.7	30	2.41	70	4	0.025	0.03	0.35
3x6		eShop	4.6	6	2.91	45	4	0.03	0.035	1
3x8		eShop	4.6	8	2.91	45	4	0.03	0.035	1
3x10		eShop	4.6	10	2.91	45	4	0.03	0.035	1
3x12		eShop	4.6	12	2.91	45	4	0.03	0.035	1
3x15		eShop	4.6	15	2.91	50	4	0.03	0.035	1
3x20		eShop	4.6	20	2.91	60	4	0.03	0.035	0.9
3x25		eShop	4.6	25	2.91	60	4	0.03	0.035	0.8
3x30		eShop	4.6	30	2.91	70	4	0.025	0.03	0.5
3x35		eShop	4.6	35	2.91	70	4	0.025	0.03	0.35
3x40		eShop	4.6	40	2.91	80	4	0.025	0.03	0.35
3x45		eShop	4.6	45	2.91	80	4	0.025	0.03	0.2



Solid carbide slot drill

Stronger cutting edges.
Dimensions similar to DIN 6527.

20 1170 – With the latest generation of
DLC coating sp².



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
ISO code																							
20 1170	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200					
20 1200	180	140	105	180	130	150	130	110								180	140	180					

Ø D _c	11X	20 1170	12X	20 1200	L _c	L ₁	Ø D ₁	L		Ø D ₃	Corner chamfer width at 45°		
	Garant		HOLEX									f _z	f _z
Solid carbide slot drill													
mm	DIN 6535 HA		DIN 6535 HB		mm	mm	mm	mm	mm	mm	mm	mm	mm
	DLC												
2	eShop		eShop		5	10	1.9	54	50	6	0.05	0.008	0.01
3	eShop		eShop		5	12	2.9	54	50	6	0.1	0.008	0.01
4	eShop		eShop		8	15	3.9	54	54	6	0.1	0.015	0.02
5	eShop		eShop		9	16	4.9	54	54	6	0.1	0.015	0.02
6	eShop		eShop		10	17	5.9	54	54	6	0.1	0.025	0.03
8	eShop		eShop		12	20	7.7	58	58	8	0.1	0.03	0.04
10	eShop		eShop		14	24	9.7	66	66	10	0.1	0.04	0.05
12	eShop		eShop		16	26	11.7	73	73	12	0.1	0.05	0.07
14	—		eShop		18	—	—	—	75	14	0.1	0.05	0.07
16	eShop		eShop		22	32	15.5	82	82	16	0.1	0.065	0.09
18	—		eShop		24	—	—	—	84	18	0.1	0.065	0.09
20	eShop		eShop		26	40	19.5	92	92	20	0.1	0.085	0.12



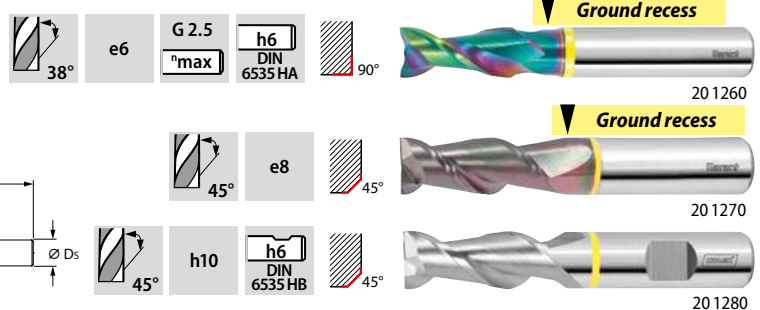
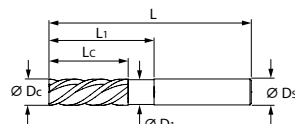
GARANT Master Alu solid carbide slot drill / solid carbide slot drill

Stronger cutting edges.
Dimensions similar to DIN 6527.

20 1260/1270 – With the latest generation of
DLC coating sp².

Advantage:

20 1260 – Very smooth cutting action
for **outstanding surface
quality.**



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
ISO code																							
20 1260	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200					
20 1270	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200					
20 1280	180	140	105	180	130	150	130	110								180	140	180					

Ø D _c	11X	20 1260	12X	20 1270	12X	20 1280	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°				
	Garant			HOLEX									f _z		f _z	
	GARANT Master Alu solid carbide slot drill			Solid carbide slot drill									20 1260	20 1270	20 1260	20 1270
	DIN 6535 HA	DIN 6535 HA	DIN 6535 HB	20 1260 20 1270	20 1260 20 1270	20 1260 20 1270							20 1270 20 1280	20 1260 20 1280	20 1260 20 1280	20 1260 20 1280
mm	DLC	DLC		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	eShop	—	—	5	10	0.9	57	6	—	0.03	—	0.04	—			
2	eShop	eShop	eShop	8	16	1.9	57	6	0.05	0.03	0.008	0.04	0.01			
3	eShop	eShop	eShop	8	18	2.9	57	6	0.1	0.04	0.008	0.05	0.01			
4	eShop	eShop	eShop	11	18	3.9	57	6	0.1	0.05	0.015	0.06	0.02			
5	eShop	eShop	eShop	13	20	4.9	57	6	0.1	0.06	0.015	0.08	0.02			
6	eShop	eShop	eShop	13	20	5.9	57	6	0.1	0.06	0.025	0.08	0.03			
8	eShop	eShop	eShop	19	26	7.7	63	8	0.1	0.08	0.03	0.1	0.04			
10	eShop	eShop	eShop	22	29	9.7	72	10	0.1	0.09	0.04	0.12	0.05			
12	eShop	eShop	eShop	26	36	11.7	83	12	0.1	0.1	0.05	0.15	0.07			
14	—	—	eShop	26	—	—	83	14	0.1	—	0.05	—	0.07			
16	eShop	eShop	eShop	32	42	15.5	92	16	0.1	0.14	0.065	0.18	0.09			
18	—	—	eShop	32	—	—	92	18	0.1	—	0.065	—	0.09			
20	eShop	eShop	eShop	38	52	19.5	104	20	0.1	0.18	0.085	0.22	0.12			



Solid carbide milling cutter

Dimensions similar to **DIN 6527**.

20 1302–1308 – Improved coating for general-purpose applications in steel and cast iron.

Note:

20 1308 – **Successor product for No. 201630 and 201522.**

20 1310 – **Successor product for No. 201640 and 201405.**



201302_3



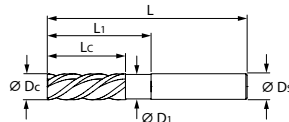
201306_3



201308_3

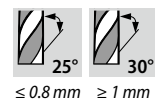


201310_3



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 1302–20 1308	170	280	200	120	110	100	70	60					70	50		90	●		●	●	○	●
20 1310	170	140	100	70	60	45							40			55	○		●	●	○	●

Ø e8 D _c	1X	1X	1X	1X	L _c		L ₁	Ø D ₁	L		Ø D _s		Shank form		Corner chamfer width at 45°	 < 750 N f _z	 < 750 N f _z
	20 1302	20 1306	20 1308	20 1310													
	mm	AlCrN	AlCrN	AlCrN		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0,25	—	—	eShop	—	—	0.5	—	—	—	38	—	3	—	HA	—	0.002	0.002
0,3	eShop	—	eShop	—	1	1	—	—	38	38	3	3	HA	HA	—	0.002	0.002
0,35	—	—	eShop	—	—	1	—	—	—	38	—	3	—	HA	—	0.002	0.002
0,4	eShop	—	eShop	—	1	1	—	—	38	38	3	3	HA	HA	—	0.002	0.002
0,5	eShop	—	eShop	—	1.5	1.5	—	—	38	38	3	3	HA	HA	—	0.003	0.003
0,6	eShop	—	eShop	—	1.5	1.5	—	—	38	38	3	3	HA	HA	—	0.003	0.003
0,7	eShop	—	eShop	—	2	2	—	—	38	38	3	3	HA	HA	—	0.003	0.003
0,8	eShop	—	eShop	—	2	2	—	—	38	38	3	3	HA	HA	—	0.003	0.003
0,9	eShop	—	eShop	—	2.5	2.5	—	—	38	38	3	3	HA	HA	—	0.003	0.003
1	eShop	eShop	eShop	—	3	3	—	—	38	50	3	3	HA	HA	0.1	0.005	0.006
1,1	—	—	eShop	—	—	3	—	—	—	50	—	3	—	HA	0.1	0.005	0.006
1,2	eShop	—	eShop	—	3	4	—	—	38	50	3	3	HA	HA	0.1	0.005	0.006
1,4	eShop	eShop	eShop	—	3	4	—	—	38	50	3	3	HA	HA	0.1	0.005	0.006
1,5	eShop	eShop	eShop	—	3	4	—	—	38	50	3	3	HA	HA	0.1	0.005	0.006
1,6	eShop	eShop	eShop	—	3	4	—	—	38	50	3	3	HA	HA	0.1	0.005	0.006
1,8	eShop	eShop	eShop	—	3	5	—	—	38	50	3	3	HA	HA	0.1	0.005	0.006
2	eShop	eShop	eShop	eShop	4	7	15	1.8	38	57	3	3	HA	HA	0.1	0.01	0.011
2,5	eShop	eShop	eShop	—	4	8	15	2.3	50	57	6	3	HB	HA	0.1	0.01	0.011
2,8	eShop	eShop	eShop	—	5	8	15	2.7	50	57	6	6	HB	HB	0.1	0.01	0.011
3	eShop	eShop	eShop	eShop	5	8	15	2.8	50	57	6	6	HB	HB	0.13	0.02	0.025
3,8	eShop	eShop	eShop	—	6	11	15	3.6	54	57	6	6	HB	HB	0.13	0.02	0.025
4	eShop	eShop	eShop	eShop	8	11	15	3.8	54	57	6	6	HB	HB	0.18	0.02	0.025
4,8	eShop	eShop	eShop	—	9	13	21	4.6	54	57	6	6	HB	HB	0.18	0.02	0.025
5	eShop	eShop	eShop	eShop	9	13	21	4.8	54	57	6	6	HB	HB	0.2	0.03	0.04
5,75	eShop	eShop	eShop	—	10	13	21	5.5	54	57	6	6	HB	HB	0.2	0.03	0.04
6	eShop	eShop	eShop	eShop	10	13	21	5.8	54	57	6	6	HB	HB	0.2	0.04	0.05
6,75	—	—	eShop	—	—	16	27	6.55	—	63	—	8	—	HB	0.2	0.04	0.05
7	eShop	eShop	eShop	eShop	11	16	27	6.8	58	63	8	8	HB	HB	0.2	0.04	0.05
7,75	eShop	eShop	eShop	—	12	19	27	7.55	58	63	8	8	HB	HB	0.2	0.04	0.05
8	eShop	eShop	eShop	eShop	12	19	27	7.8	58	63	8	8	HB	HB	0.2	0.05	0.08
8,7	—	—	eShop	—	—	19	32	8.5	—	72	—	10	—	HB	0.3	0.05	0.08
9	eShop	eShop	eShop	eShop	13	19	32	8.8	66	72	10	10	HB	HB	0.3	0.05	0.08
9,7	eShop	eShop	eShop	—	14	22	32	9.5	66	72	10	10	HB	HB	0.3	0.05	0.08
10	eShop	eShop	eShop	eShop	14	22	32	9.8	66	72	10	10	HB	HB	0.3	0.06	0.09
11	eShop	eShop	eShop	—	16	26	38	10.8	73	83	12	12	HB	HB	0.3	0.06	0.09
11,7	eShop	eShop	eShop	—	16	26	38	11.5	73	83	12	12	HB	HB	0.3	0.06	0.09
12	eShop	eShop	eShop	eShop	16	26	38	11.8	73	83	12	12	HB	HB	0.3	0.07	0.1
13,7	eShop	eShop	eShop	—	18	26	38	13.5	75	83	14	14	HB	HB	0.3	0.07	0.1
14	eShop	eShop	eShop	eShop	18	26	38	13.8	75	83	14	14	HB	HB	0.3	0.07	0.1
15,7	eShop	eShop	eShop	—	22	32	44	15.4	82	92	16	16	HB	HB	0.4	0.08	0.13
16	eShop	eShop	eShop	eShop	22	32	44	15.7	82	92	16	16	HB	HB	0.4	0.08	0.13
18	eShop	eShop	eShop	eShop	24	32	44	17.7	84	92	18	18	HB	HB	0.4	0.09	0.15
20	eShop	eShop	eShop	eShop	26	38	54	19.7	92	104	20	20	HB	HB	0.5	0.1	0.15



GARANT Diabolo solid carbide precision micro slot drill

GARANT Diabolo:

Special geometry, coating and carbide **for hard machining in the high-performance field**. Suitable even for **machining electrolytic copper**. Double-relief ground 2 chamfers hollow ground for high-precision hard machining.

Tolerances:

Neck $\varnothing$: $D_1 = 0 / -0.01 \text{ mm}$.

Recess angle $\alpha = 16^\circ$.

Note:

At greater tool overhang lengths, use a reduced value for a_p !

Values for:

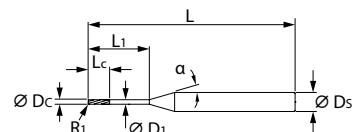
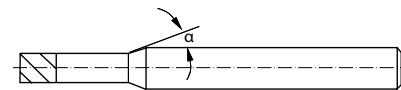
slots milled from solid: $a_p = 0.05 \times D \times a_{p, \text{korr}}$

side milling: $a_p = 0.1 \times D \times a_{p, \text{korr}}$

To calculate the feed rate v_f please use the actual speed of the machine (the maximum possible speed)! e.g: $v_f = 18000 [\text{rpm}] \times f_z [\text{mm/Z}] \times z$

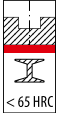
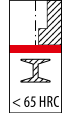


20 1631_2x10



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	Alu cast > 10 % Si 											INOX	INOX	Ti	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
20 1631				200	200	190	170	120	100	72	55	50	45	90	80		140					

$\varnothing D_c \times L_1$	11X	20 1631	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z	f_z	Correction factor $a_{p, \text{corr}}$
mm	TiAlN		mm	mm	mm	mm	mm	mm	mm	
0,1x0,3	eShop		0.15	0.3	0.08	45	4	0.005	0.009	1
0,1x0,5	eShop		0.15	0.5	0.08	45	4	0.005	0.009	1
0,1x1	eShop		0.15	1	0.08	45	4	0.003	0.005	0.5
0,2x0,5	eShop		0.3	0.5	0.18	45	4	0.005	0.009	1
0,2x1	eShop		0.3	1	0.18	45	4	0.005	0.009	1
0,2x1,5	eShop		0.3	1.5	0.18	45	4	0.005	0.009	0.8
0,2x2	eShop		0.3	2	0.18	45	4	0.003	0.005	0.5
0,2x3	eShop		0.3	3	0.18	45	4	0.003	0.005	0.2
0,3x0,5	eShop		0.4	0.5	0.28	45	4	0.008	0.012	1
0,3x1	eShop		0.4	1	0.28	45	4	0.008	0.012	1
0,3x2	eShop		0.4	2	0.28	45	4	0.008	0.012	0.9
0,3x3	eShop		0.4	3	0.28	45	4	0.005	0.009	0.5
0,3x4	eShop		0.4	4	0.28	45	4	0.005	0.009	0.35
0,4x1	eShop		0.6	1	0.38	45	4	0.008	0.012	1
0,4x2	eShop		0.6	2	0.38	45	4	0.008	0.012	1
0,4x3	eShop		0.6	3	0.38	45	4	0.008	0.012	0.8
0,4x4	eShop		0.6	4	0.38	45	4	0.005	0.009	0.5
0,4x5	eShop		0.6	5	0.38	45	4	0.005	0.009	0.35
0,4x6	eShop		0.6	6	0.38	45	4	0.005	0.009	0.2
0,5x1	eShop		0.7	1	0.48	45	4	0.012	0.015	1
0,5x2	eShop		0.7	2	0.48	45	4	0.012	0.015	1
0,5x3	eShop		0.7	3	0.48	45	4	0.012	0.015	0.9
0,5x4	eShop		0.7	4	0.48	45	4	0.012	0.015	0.8
0,5x5	eShop		0.7	5	0.48	45	4	0.008	0.012	0.5
0,5x6	eShop		0.7	6	0.48	45	4	0.008	0.012	0.35
0,5x8	eShop		0.7	8	0.48	45	4	0.008	0.012	0.12
0,5x10	eShop		0.7	10	0.48	50	4	0.005	0.009	0.08
0,6x1	eShop		0.9	1	0.58	45	4	0.012	0.015	1
0,6x2	eShop		0.9	2	0.58	45	4	0.012	0.015	1
0,6x3	eShop		0.9	3	0.58	45	4	0.012	0.015	1
0,6x4	eShop		0.9	4	0.58	45	4	0.012	0.015	0.9
0,6x5	eShop		0.9	5	0.58	45	4	0.012	0.015	0.8
0,6x6	eShop		0.9	6	0.58	45	4	0.008	0.012	0.5
0,6x8	eShop		0.9	8	0.58	45	4	0.008	0.012	0.35
0,6x10	eShop		0.9	10	0.58	50	4	0.008	0.012	0.12
0,7x2	eShop		1	2	0.68	45	4	0.01	0.012	1
0,8x2	eShop		1.2	2	0.78	45	4	0.012	0.015	1
0,8x3	eShop		1.2	3	0.78	45	4	0.012	0.015	1
0,8x4	eShop		1.2	4	0.78	45	4	0.012	0.015	1
0,8x5	eShop		1.2	5	0.78	45	4	0.012	0.015	0.9
0,8x6	eShop		1.2	6	0.78	45	4	0.012	0.015	0.8
0,8x8	eShop		1.2	8	0.78	45	4	0.008	0.012	0.5
0,8x10	eShop		1.2	10	0.78	50	4	0.008	0.012	0.35
0,9x4	eShop		1.3	4	0.88	45	4	0.012	0.015	1

$\varnothing D_c \times L_1$	11X	20 1631	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_3$			Correction factor $a_{p, corr}$
mm		TiAlN	mm	mm	mm	mm	mm	mm	mm	
1x2		eShop	1.5	2	0.95	45	4	0.015	0.02	1
1x3		eShop	1.5	3	0.95	45	4	0.015	0.02	1
1x4		eShop	1.5	4	0.95	45	4	0.015	0.02	1
1x5		eShop	1.5	5	0.95	45	4	0.015	0.02	1
1x6		eShop	1.5	6	0.95	45	4	0.015	0.02	0.9
1x8		eShop	1.5	8	0.95	45	4	0.015	0.02	0.8
1x10		eShop	1.5	10	0.95	50	4	0.01	0.015	0.5
1x12		eShop	1.5	12	0.95	50	4	0.01	0.015	0.35
1x14		eShop	1.5	14	0.95	50	4	0.01	0.015	0.2
1x16		eShop	1.5	16	0.95	60	4	0.01	0.015	0.12
1x18		eShop	1.5	18	0.95	60	4	0.006	0.01	0.08
1x20		eShop	1.5	20	0.95	60	4	0.006	0.01	0.04
1,2x2		eShop	1.8	2	1.14	45	4	0.015	0.02	1
1,2x4		eShop	1.8	4	1.14	45	4	0.015	0.02	1
1,2x6		eShop	1.8	6	1.14	45	4	0.015	0.02	1
1,2x8		eShop	1.8	8	1.14	45	4	0.015	0.02	0.9
1,2x10		eShop	1.8	10	1.14	45	4	0.015	0.02	0.8
1,2x12		eShop	1.8	12	1.14	50	4	0.01	0.015	0.5
1,2x14		eShop	1.8	14	1.14	50	4	0.01	0.015	0.35
1,2x16		eShop	1.8	16	1.14	50	4	0.01	0.015	0.35
1,2x18		eShop	1.8	18	1.14	60	4	0.01	0.015	0.2
1,2x20		eShop	1.8	20	1.14	60	4	0.01	0.015	0.12
1,4x6		eShop	2.1	6	1.34	45	4	0.01	0.015	1
1,4x8		eShop	2.1	8	1.34	45	4	0.01	0.015	1
1,5x3		eShop	2.3	3	1.44	45	4	0.015	0.02	1
1,5x4		eShop	2.3	4	1.44	45	4	0.015	0.02	1
1,5x6		eShop	2.3	6	1.44	45	4	0.015	0.02	1
1,5x8		eShop	2.3	8	1.44	45	4	0.015	0.02	1
1,5x10		eShop	2.3	10	1.44	45	4	0.015	0.02	0.9
1,5x12		eShop	2.3	12	1.44	50	4	0.015	0.02	0.8
1,5x14		eShop	2.3	14	1.44	50	4	0.015	0.02	0.8
1,5x16		eShop	2.3	16	1.44	50	4	0.01	0.015	0.5
1,5x18		eShop	2.3	18	1.44	55	4	0.01	0.015	0.35
1,5x20		eShop	2.3	20	1.44	55	4	0.01	0.015	0.35
1,6x4		eShop	2.4	4	1.51	45	4	0.025	0.03	1
1,6x8		eShop	2.4	8	1.51	45	4	0.025	0.03	1
1,6x10		eShop	2.4	10	1.51	45	4	0.025	0.03	0.8
1,6x12		eShop	2.4	12	1.51	45	4	0.025	0.03	0.8
1,6x16		eShop	2.4	16	1.51	55	4	0.02	0.025	0.5
1,6x20		eShop	2.4	20	1.51	55	4	0.02	0.025	0.35
1,8x6		eShop	2.7	6	1.71	45	4	0.025	0.03	1
1,8x8		eShop	2.7	8	1.71	45	4	0.025	0.03	1
1,8x10		eShop	2.7	10	1.71	50	4	0.025	0.03	0.9
1,8x12		eShop	2.7	12	1.71	50	4	0.025	0.03	0.9
1,8x16		eShop	2.7	16	1.71	50	4	0.025	0.03	0.8
1,8x20		eShop	2.7	20	1.71	55	4	0.02	0.025	0.5
2x4		eShop	3	4	1.91	45	4	0.025	0.03	1
2x6		eShop	3	6	1.91	45	4	0.025	0.03	1
2x8		eShop	3	8	1.91	45	4	0.025	0.03	1
2x10		eShop	3	10	1.91	45	4	0.025	0.03	1
2x12		eShop	3	12	1.91	50	4	0.025	0.03	0.9
2x14		eShop	3	14	1.91	50	4	0.025	0.03	0.9
2x16		eShop	3	16	1.91	50	4	0.025	0.03	0.8
2x18		eShop	3	18	1.91	55	4	0.025	0.03	0.8
2x20		eShop	3	20	1.91	55	4	0.02	0.025	0.5
2x22		eShop	3	22	1.91	60	4	0.02	0.025	0.5
2x25		eShop	3	25	1.91	60	4	0.02	0.025	0.35
2x30		eShop	3	30	1.91	70	4	0.02	0.025	0.2
2x35		eShop	3	35	1.91	80	4	0.015	0.02	0.08
2x40		eShop	3	40	1.91	80	4	0.015	0.02	0.08
2,5x6		eShop	3.7	6	2.41	45	4	0.025	0.03	1
2,5x8		eShop	3.7	8	2.41	45	4	0.025	0.03	1
2,5x10		eShop	3.7	10	2.41	45	4	0.025	0.03	1
2,5x12		eShop	3.7	12	2.41	50	4	0.025	0.03	0.9
2,5x15		eShop	3.7	15	2.41	50	4	0.025	0.03	0.9
2,5x20		eShop	3.7	20	2.41	60	4	0.025	0.03	0.8
2,5x25		eShop	3.7	25	2.41	60	4	0.02	0.025	0.5
2,5x30		eShop	3.7	30	2.41	70	4	0.02	0.025	0.35
3x6		eShop	4.6	6	2.91	45	4	0.025	0.03	1
3x8		eShop	4.6	8	2.91	45	4	0.025	0.03	1
3x10		eShop	4.6	10	2.91	45	4	0.025	0.03	1
3x12		eShop	4.6	12	2.91	45	4	0.025	0.03	1
3x14		eShop	4.6	14	2.91	50	4	0.025	0.03	1
3x16		eShop	4.6	16	2.91	50	4	0.025	0.03	1
3x18		eShop	4.6	18	2.91	60	4	0.025	0.03	0.9
3x20		eShop	4.6	20	2.91	60	4	0.025	0.03	0.9
3x25		eShop	4.6	25	2.91	60	4	0.025	0.03	0.8
3x30		eShop	4.6	30	2.91	70	4	0.02	0.025	0.5
3x35		eShop	4.6	35	2.91	70	4	0.02	0.025	0.35
3x40		eShop	4.6	40	2.91	80	4	0.02	0.025	0.35

Solid carbide	DIN 6527	Type H	e8					HPC
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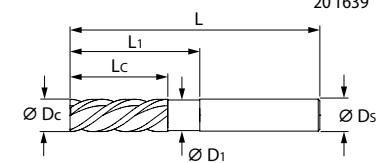
Garant GARANT Diabolo solid carbide milling cutter HPC

GARANT Diabolo:

Special geometry, coating and carbide specially for hard machining.

New generation of high performance milling cutters in the **HPC machining range**.

From size 2 with neck recess (dimensions L_1 and $\varnothing D_1$).



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	
20 1639																		

$\varnothing e8 D_c$	11X 20 1639 GARANT Diabolo solid carbide slot drill	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner chamfer width at 45°		
mm	HPC TiAlN	mm	mm	mm	mm	mm	mm	mm	mm
0,5	eShop	1.5	—	—	57	6	0.02	0.003	0.004
1	eShop	3	—	—	57	6	0.02	0.003	0.004
1,5	eShop	4	—	—	57	6	0.03	0.004	0.005
2	eShop	5	12	1.8	57	6	0.03	0.004	0.006
2,5	eShop	6	13	2.3	57	6	0.04	0.005	0.007
3	eShop	8	15	2.8	57	6	0.04	0.006	0.008
3,5	eShop	8	15	3.3	57	6	0.05	0.007	0.009
4	eShop	11	15	3.8	57	6	0.05	0.008	0.01
5	eShop	13	21	4.8	57	6	0.06	0.01	0.014
6	eShop	16	24	5.8	57	6	0.07	0.01	0.014
8	eShop	19	27	7.8	63	8	0.08	0.01	0.016
10	eShop	22	32	9.8	72	10	0.1	0.02	0.024
12	eShop	26	38	11.8	83	12	0.13	0.02	0.024
16	eShop	32	44	15.7	92	16	0.18	0.03	0.035
20	eShop	38	54	19.7	104	20	0.2	0.04	0.045

Solid carbide	Standard	Type H	0 -0.02					HPC
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Garant Solid carbide milling cutter HPC

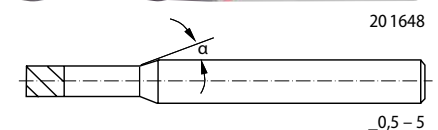
GARANT Diabolo 70:

Special solid carbide substrate with extremely high tensile strength combined with outstanding wear resistance for optimum process reliability. Newly developed **nano-crystalline high-tech coating for hard milling up to 70 HRC**. Very suitable for **continuous use** in tool and mould making.

Sizes 0.5 – 5: **Recess angle $\alpha = 15^\circ$** .

Application: Due to the **special hard geometry** ideal for use on hardened materials from 60 HRC to 70 HRC.

Note: f_z for $a_p = 0.05 \times D$.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni	
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	N		
20 1648																		

$\varnothing D_c$	11X 20 1648 Solid carbide slot drill	L_c	L	$\varnothing D_s$		
mm	HPC TiAlN	mm	mm	mm	mm	mm
0,5	eShop	1.3	40	4	0.003	0.004
1	eShop	2.5	40	4	0.003	0.004
1,5	eShop	3.8	40	4	0.004	0.005
2	eShop	5	40	4	0.004	0.006
2,5	eShop	6.3	40	4	0.005	0.007
3	eShop	7.5	50	6	0.006	0.008
4	eShop	10	50	6	0.008	0.01
5	eShop	12.5	50	6	0.01	0.014
6	eShop	15	50	6	0.01	0.014

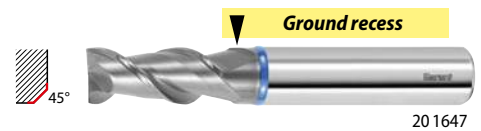
Solid carbide	DIN 6527	Type N	e8						h6 DIN 6535 HA	HPC
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Garant GARANT Master INOX solid carbide milling cutter HPC

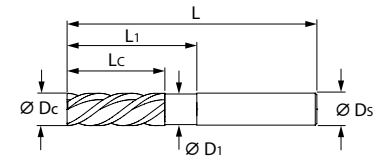
Double relief ground 2 chamfers hollow ground for use in HPC applications.
Greater oxidation resistance and high-temperature hardness.

Can be used at high cutting speeds, particularly suitable even for Toolox®.

Note: Successor product to No. 201644.



20 1647



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	P	P	P	P	P	H	H	M	M	O					
20 1647				250	230	200	170	170						115	80	110	90	O					

Ø e8 D _c	11X	20 1647	L _c	L ₁	Ø D ₁	L	Ø D ₅	Corner chamfer width at 45°		
		GARANT Master INOX solid carbide slot drill								
		HPC								
		TiAlN								
mm			mm	mm	mm	mm	mm	mm	mm	mm
1		eShop	3	13	0.95	57	6	0.02	0.008	0.01
2		eShop	5	15	1.8	57	6	0.03	0.01	0.014
3		eShop	8	15	2.8	57	6	0.04	0.015	0.02
4		eShop	11	15	3.8	57	6	0.05	0.018	0.022
5		eShop	13	21	4.8	57	6	0.08	0.018	0.022
6		eShop	13	21	5.8	57	6	0.15	0.035	0.04
8		eShop	19	27	7.8	63	8	0.17	0.05	0.06
10		eShop	22	32	9.8	72	10	0.17	0.055	0.067
12		eShop	26	38	11.8	83	12	0.25	0.07	0.08
16		eShop	32	44	15.7	92	16	0.3	0.09	0.11
20		eShop	38	54	19.7	104	20	0.4	0.11	0.13

Solid carbide	DIN 6527	Type N	h10						h6 DIN 6535 HA
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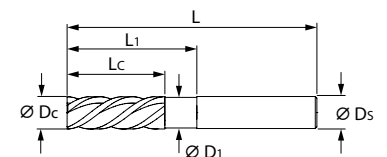
HOLEX Solid carbide slot drills

Eccentric relief ground for stronger cutting edges.
Dimensions similar to DIN 6527.

Note: Successor product to No. 201646.

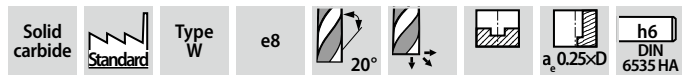


20 1650



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	P	P	P	P	P	M	M	S	K	O					
20 1650		280	200	120	105	100								80	60		90	O					

Ø D _c	12X	20 1650	L _c	L	Ø D ₅	Corner chamfer width at 45°		
		Solid carbide slot drill						
		TiAlN						
mm			mm	mm	mm	mm	mm	mm
3		eShop	8	57	6	0.1	0.01	0.011
4		eShop	11	57	6	0.1	0.02	0.023
5		eShop	13	57	6	0.1	0.02	0.023
6		eShop	13	57	6	0.1	0.03	0.033
8		eShop	19	63	8	0.1	0.04	0.045
10		eShop	22	72	10	0.1	0.05	0.06
12		eShop	26	83	12	0.1	0.06	0.08
16		eShop	32	92	16	0.1	0.08	0.1
20		eShop	38	104	20	0.1	0.1	0.12

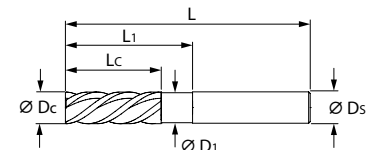


Garant Solid carbide milling cutter

With the latest generation of **DLC coating sp²**.

Special geometry for machining aluminium and plastics.

Application: Double relieved chip angle, **especially for aluminium machining.**



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 1735	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200					

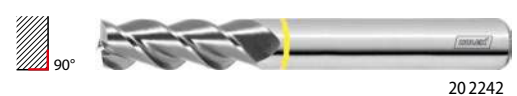
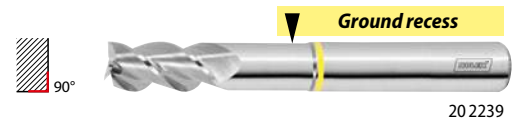
Ø e8 D _c	20 1735	No. of teeth Z	L _c	L ₁	Ø D ₁	L	Ø D _s	f _z	f _z
mm	DLC		mm	mm	mm	mm	mm	mm	mm
1	eShop	2	5	8	0.9	50	3	0.004	0.005
2	eShop	2	8	11	1.85	50	3	0.004	0.01
3	eShop	2	11	14	2.8	50	3	0.008	0.01
4	eShop	2	13	16	3.8	54	4	0.015	0.025
5	eShop	2	15	18	4.8	54	5	0.015	0.025
6	eShop	2	16	21	5.8	64	6	0.025	0.04
8	eShop	2	22	27	7.8	70	8	0.03	0.05
10	eShop	2	25	32	9.8	72	10	0.04	0.065
12	eShop	3	28	38	11.8	83	12	0.05	0.09
14	eShop	3	30	42	13.8	83	14	0.05	0.09
16	eShop	3	36	44	15.8	92	16	0.065	0.12
20	eShop	3	41	54	19.8	104	20	0.085	0.15



HOLEX Solid carbide milling cutter

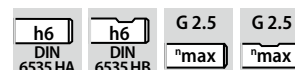
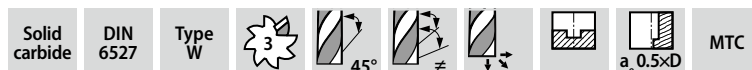
Eccentric relief ground, additionally **finish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium workpieces.

Application: For roughing and finishing.



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 2238–20 2242	170	140	105	160	110	130	110	90								160	120	150					

Ø e8 D _c	20 2241	20 2239	20 2238	20 2242	L _c		L ₁	Ø D ₁		L		Ø D _s	Corner cham- fer width at 45°		
	Solid carbide slot drill				20 2241 20 2239	20 2238 20 2242	20 2239	20 2239	20 2241	20 2239 20 2238 20 2242		20 2238		f _z	f _z
mm					mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3	eShop	eShop	eShop	eShop	6	9	27	2.7	57	65	6	0.1	0.008	0.01	
4	eShop	eShop	eShop	eShop	8	12	27	3.7	57	65	6	0.1	0.015	0.02	
5	eShop	eShop	eShop	eShop	10	15	27	4.7	57	65	6	0.1	0.015	0.02	
6	eShop	eShop	eShop	eShop	12	18	27	5.5	57	65	6	0.2	0.025	0.03	
8	eShop	eShop	eShop	eShop	16	24	32	7.5	63	70	8	0.2	0.03	0.04	
10	eShop	eShop	eShop	eShop	20	30	42	9.5	72	85	10	0.2	0.04	0.05	
12	eShop	eShop	eShop	eShop	24	36	50	11.5	83	100	12	0.2	0.05	0.07	
16	eShop	eShop	eShop	eShop	32	48	56	15.5	92	110	16	0.2	0.065	0.09	
20	eShop	eShop	eShop	eShop	40	60	70	19.5	104	126	20	0.2	0.085	0.12	



Garant Solid carbide milling cutter MTC

Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium workpieces.

Without 45° corner chamfer.

20 2244 – **Without** 45° corner chamfer.

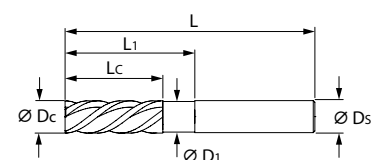
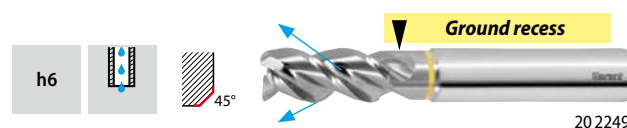
Size 1-2 – tolerance: Size nominal $\varnothing D_c = e8$.

Size 2.5–20M – tolerance: Size nominal $\varnothing D_c = h6$.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

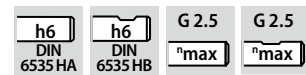
Note:

20 2244 – **NEW GENERATION AVAILABLE! Recommended successor product is No. 202002.**



Suitable for/ v _c [m/min]	Alu	Alu 	Alu cast Si > 10 %	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey- comb sandwich	Cu	CuZn					
ISO code 20 2243–20 2249	N 190	N 150	N 120	N 180	N 130	N 150	N 130	N 110	N	N	N	N	N	N	N	N 180	N 120	N 150					

Ø D _c	1X	20 2243	1X	20 2244	1X	20 2249	L _c	L ₁	Ø D ₁	L	Ø D ₃	Shank form	Corner cham-fer width at 45°		
	Solid carbide milling cutter			Solid carbide milling cutter with internal coolant supply											
	MTC													20 2243	20 2249
mm							mm	mm	mm	mm	mm	mm	mm	mm	mm
1	—	eShop	—	—	2.5	5	0.95	57	6	HA	—	0.005	0.008		
1,5	—	eShop	—	—	4	7.5	1.44	57	6	HA	—	0.005	0.008		
2	—	eShop	—	—	5	10	1.92	57	6	HA	—	0.006	0.009		
2,5	eShop	eShop	—	—	6.5	12.5	2.4	57	6	HA	0.05	0.006	0.009		
3	eShop	eShop	—	—	8	13	2.7	57	6	HA	0.1	0.008	0.01		
3,5	eShop	eShop	—	—	11	17	3.2	57	6	HA	0.1	0.008	0.01		
4	eShop	eShop	—	—	11	17	3.7	57	6	HA	0.1	0.015	0.02		
4,5	eShop	eShop	—	—	13	19	4.2	57	6	HA	0.1	0.015	0.02		
5	eShop	eShop	—	—	13	19	4.7	57	6	HA	0.1	0.015	0.02		
5,5	eShop	eShop	—	—	13	19	5.2	57	6	HA	0.1	0.015	0.02		
6	eShop	eShop	eShop	—	13	19	5.7	57	6	HA	0.2	0.025	0.03		
6M	eShop	eShop	—	—	18	24	5.7	62	6	HA	0.2	0.025	0.03		
6,5	eShop	eShop	—	—	21	25	6.1	63	8	HA	0.2	0.025	0.03		
7,5	eShop	eShop	—	—	21	25	7.1	63	8	HA	0.2	0.03	0.04		
8	eShop	eShop	eShop	—	21	25	7.4	63	8	HA	0.2	0.03	0.04		
8M	eShop	eShop	—	—	24	30	7.4	68	8	HA	0.2	0.03	0.04		
8,5	eShop	eShop	—	—	22	30	7.9	72	10	HA	0.2	0.03	0.04		
9,5	eShop	eShop	—	—	22	30	8.9	72	10	HA	0.2	0.04	0.05		
10	eShop	eShop	eShop	—	22	30	9.2	72	10	HA	0.2	0.04	0.05		
10M	eShop	eShop	—	—	30	38	9.2	80	10	HA	0.2	0.04	0.05		
11,5	eShop	eShop	—	—	26	36	10.5	83	12	HA	0.2	0.05	0.07		
12	eShop	eShop	eShop	—	26	36	11	83	12	HA	0.2	0.05	0.07		
12M	eShop	eShop	—	—	36	46	11	93	12	HA	0.2	0.05	0.07		
14	eShop	—	—	—	26	36	13	83	14	HA	0.2	0.05	0.07		
16	eShop	eShop	eShop	—	36	42	15	92	16	HB	0.2	0.065	0.09		
16M	eShop	eShop	—	—	48	58	15	108	16	HB	0.2	0.065	0.09		
20	eShop	eShop	eShop	—	41	52	19	104	20	HB	0.2	0.085	0.12		
20M	eShop	eShop	—	—	60	74	19	126	20	HB	0.2	0.085	0.12		
25	eShop	—	—	—	52	62	24	121	25	HB	0.3	0.085	0.12		



Garant Solid carbide milling cutter MTC

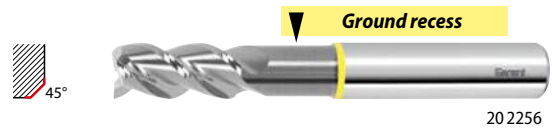
Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium workpieces.

20 2257 – **Without** 45° corner chamfer.

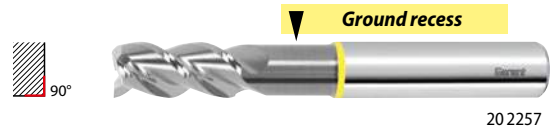
Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

Note:

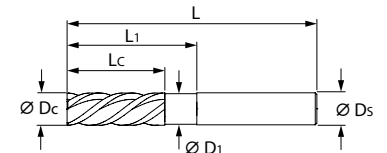
20 2257 – **NEW GENERATION AVAILABLE!**
Recommended successor product is No. 202012.



20 2256

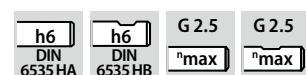


20 2257



Suitable for/ v _c [m/min]	Alu 	Alu 	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey- comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 2256/2257	190	150	120	180	130	150	130	110								180	120	150		●	●	○	○

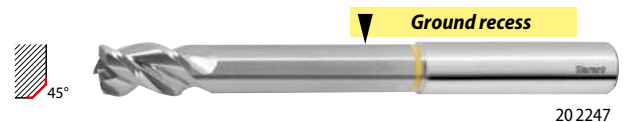
∅ h6 D _c	11X	20 2256	11X	20 2257	L _c	L ₁	∅ D ₁	L	∅ D _s	Shank form	Corner chamfer width at 45°		
	Solid carbide milling cutter												
												f _z	f _z
mm	MTC				mm	mm	mm	mm	mm		20 2256 mm	mm	mm
6	eShop				13	24	5.7	62	6	HA	0.2	0.025	0.03
8	eShop				21	30	7.4	68	8	HA	0.2	0.03	0.04
10	eShop				22	38	9.2	80	10	HA	0.2	0.04	0.05
12	eShop				26	46	11	93	12	HA	0.2	0.05	0.07
16	eShop				36	58	15	108	16	HB	0.2	0.065	0.09
20	eShop				41	74	19	126	20	HB	0.2	0.085	0.12



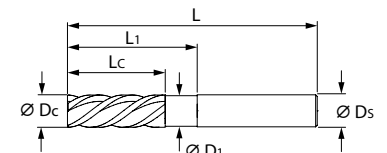
Garant Solid carbide milling cutter MTC

Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium workpieces.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

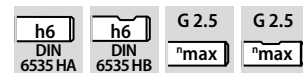
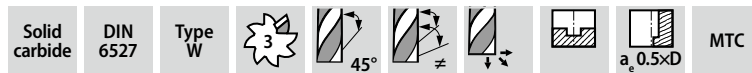


20 2247



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
			cast > 10 % Si	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 2247	130	100	85	140	100	110	100	85								100	80	100					

Ø h6 D _c	11X	20 2247	L _c	L ₁	Ø D ₁	L	Ø D _s	Shank form	Corner chamfer width at 45°		
		Solid carbide milling cutter								f _z	f _z
mm		MTC	mm	mm	mm	mm	mm		mm	mm	mm
4		eShop	6.5	24	3.7	80	6	HA	0.1	0.015	0.02
5		eShop	8	30	4.7	80	6	HA	0.1	0.015	0.02
6		eShop	10	42	5.7	80	6	HA	0.2	0.025	0.03
8		eShop	13	62	7.4	100	8	HA	0.2	0.03	0.04
10		eShop	16	58	9.2	100	10	HA	0.2	0.04	0.05
12		eShop	19	73	11	120	12	HA	0.2	0.05	0.07
16		eShop	25	100	15	150	16	HB	0.2	0.065	0.09
20		eShop	32	98	19	150	20	HB	0.2	0.085	0.12



Garant Solid carbide milling cutter MTC

With the latest generation of **DLC coating sp²**.

Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium components.

Lengths similar to **DIN 6527 long**.

20 2272 – **Without** 45° corner chamfer.

Size 1–2 – tolerance: Size nominal $\varnothing D_c = e8$.

Size 2.5–20M – tolerance: Size nominal $\varnothing D_c = h6$.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

Note:

20 2270 – **NEW GENERATION AVAILABLE!**
Recommended successor products are No. 202004 and No. 202010.

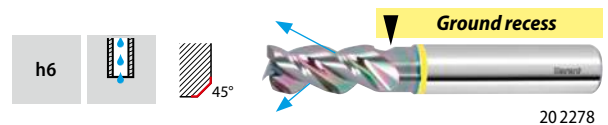
20 2278 – **NEW GENERATION AVAILABLE!**
Recommended successor product is No. 202006.



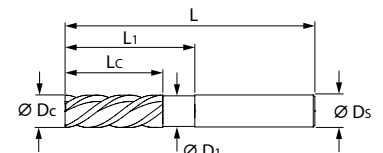
20 2270



20 2272

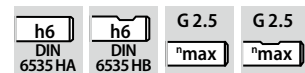


20 2278



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si		acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 2270–20 2278	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200					

$\varnothing D_c$	20 2270	20 2272	20 2278	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Shank form	Corner chamfer width at 45°	Alu	Alu
	Solid carbide milling cutter			Solid carbide milling cutter with internal coolant supply							f_z	f_z
	MTC									20 2270 20 2278		
mm	DLC	DLC	DLC	mm	mm	mm	mm	mm		mm	mm	mm
1	–	eShop	–	2.5	5	0.95	57	6	HA	–	0.005	0.008
1,5	–	eShop	–	4	7.5	1.44	57	6	HA	–	0.005	0.008
2	–	eShop	–	5	10	1.92	57	6	HA	–	0.006	0.009
2,5	eShop	eShop	–	6.5	12.5	2.4	57	6	HA	0.05	0.006	0.009
3	eShop	eShop	–	8	13	2.7	57	6	HA	0.1	0.008	0.01
3,5	eShop	eShop	–	11	17	3.2	57	6	HA	0.1	0.008	0.01
4	eShop	eShop	–	11	17	3.7	57	6	HA	0.1	0.015	0.02
4,5	eShop	eShop	–	13	19	4.2	57	6	HA	0.1	0.015	0.02
5	eShop	eShop	–	13	19	4.7	57	6	HA	0.1	0.015	0.02
5,5	eShop	eShop	–	13	19	5.2	57	6	HA	0.1	0.015	0.02
6	eShop	eShop	eShop	13	19	5.7	57	6	HA	0.2	0.025	0.03
6M	eShop	eShop	–	18	24	5.7	62	6	HA	0.2	0.025	0.03
7,5	eShop	eShop	–	21	25	7.1	63	8	HA	0.2	0.03	0.04
8	eShop	eShop	eShop	21	25	7.4	63	8	HA	0.2	0.03	0.04
8M	eShop	eShop	–	24	30	7.4	68	8	HA	0.2	0.03	0.04
9,5	eShop	eShop	–	22	30	8.9	72	10	HA	0.2	0.04	0.05
10	eShop	eShop	eShop	22	30	9.2	72	10	HA	0.2	0.04	0.05
10M	eShop	eShop	–	30	38	9.2	80	10	HA	0.2	0.04	0.05
11,5	eShop	eShop	–	26	36	10.5	83	12	HA	0.2	0.05	0.07
12	eShop	eShop	eShop	26	36	11	83	12	HA	0.2	0.05	0.07
12M	eShop	eShop	–	36	46	11	93	12	HA	0.2	0.05	0.07
14	eShop	–	–	26	36	13	83	14	HA	0.2	0.05	0.07
16	eShop	eShop	eShop	36	42	15	92	16	HB	0.2	0.065	0.09
16M	eShop	eShop	–	48	58	15	108	16	HB	0.2	0.065	0.09
20	eShop	eShop	eShop	41	52	19	104	20	HB	0.2	0.085	0.12
20M	eShop	eShop	–	60	74	19	126	20	HB	0.2	0.085	0.12



Garant Solid carbide milling cutter MTC

With the latest generation of **DLC coating sp²**.

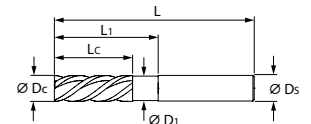
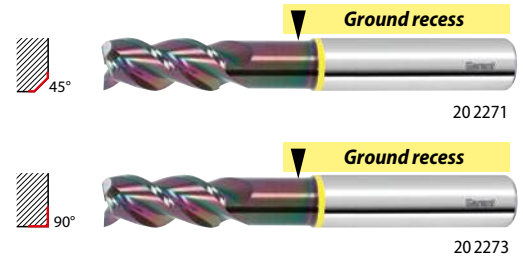
Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium components.

20 2273 – **Without** 45° cutting edge chamfer.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

Note:

20 2271 – **NEW GENERATION AVAILABLE!**
Recommended successor product is No. 202014.



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 2271/2273	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200					

Ø h6 D _c	11X	20 2271	11X	20 2273	L _c	L ₁	Ø D ₁	L	Ø D _s	Shank form	Corner chamfer width at 45°	Alu	Alu
		Solid carbide milling cutter											
		MTC											
mm		DLC		DLC	mm	mm	mm	mm	mm		20 2271	mm	mm
6		eShop		eShop	13	24	5.7	62	6	HA	0.2	0.025	0.03
8		eShop		eShop	21	30	7.4	68	8	HA	0.2	0.03	0.04
10		eShop		eShop	22	38	9.2	80	10	HA	0.2	0.04	0.05
12		eShop		eShop	26	46	11	93	12	HA	0.2	0.05	0.07
16		eShop		eShop	36	58	15	108	16	HB	0.2	0.065	0.09
20		eShop		eShop	41	74	19	126	20	HB	0.2	0.085	0.12



Garant Solid carbide milling cutter MTC

With the latest generation of **DLC coating sp²**.

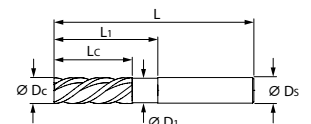
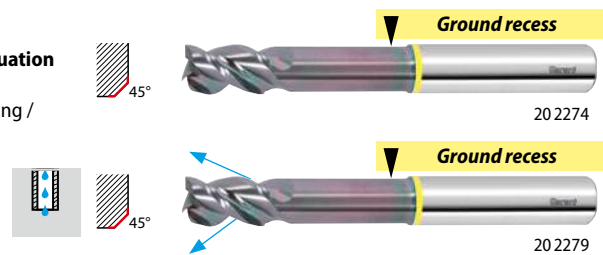
Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium components.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

Note:

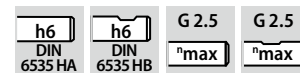
20 2274 – **NEW GENERATION AVAILABLE!**
Recommended successor product is No. 202017.

20 2279 – **NEW GENERATION AVAILABLE!**
Recommended successor product is No. 202019.



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 2274/2279	440	400	360	180	150	180	140	120		170	150	140	120	150		280	150	190					

Ø h6 D _c	11X	20 2274	11X	20 2279	L _c	L ₁	Ø D ₁	L	Ø D _s	Shank form	Corner chamfer width at 45°	Alu	Alu
		Solid carbide milling cutter											
		MTC											
mm		DLC		DLC	mm	mm	mm	mm	mm			mm	mm
4		eShop		—	6.5	24	3.7	80	6	HA	0.1	0.015	0.02
5		eShop		—	8	30	4.7	80	6	HA	0.1	0.015	0.02
6		eShop		eShop	10	42	5.7	80	6	HA	0.2	0.025	0.03
8		eShop		eShop	13	62	7.4	100	8	HA	0.2	0.03	0.04
10		eShop		eShop	16	58	9.2	100	10	HA	0.2	0.04	0.05
12		eShop		eShop	19	73	11	120	12	HA	0.2	0.05	0.07
16		eShop		eShop	25	100	15	150	16	HB	0.2	0.065	0.09
20		eShop		eShop	32	98	19	150	20	HB	0.2	0.085	0.12



Garant Solid carbide milling cutter TPC

Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium workpieces. With double chip-breaker for exemplary chip formation.

20 2282/2284 – With the latest generation of **DLC coating** sp².

Note:

20 2282 – **NEW GENERATION AVAILABLE! Recommended successor product is No. 203114.**

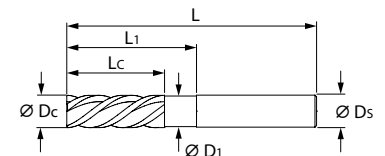
20 2284 – **NEW GENERATION AVAILABLE! Recommended successor product is No. 203115.**

20 2281/2282 – $a_{e\max} = 0.12 \times D$ for TPC machining.

$h_{\max}$: The values stated in the table are maximum values.

20 2283/2284 – $a_{e\max} = 0.1 \times D$ for TPC machining.

$h_{\max}$: The values stated in the table are maximum values.



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 2281/2283	130	100	85	125	90	100	80	70		125	115	105	90	110		100	70	90					
20 2282/2284	280	270	180	125	110	140	90	80								120	80	100					

Ø h6 Dc	1TX	20 2281	1TX	20 2282	Lc	L1	Ø D1	L	Ø Ds	Shank form	Corner cham- fer width at 45°	TPC Alu hmax
		Solid carbide milling cutter										
		TPC										
mm		DLC		mm	mm	mm	mm	mm			mm	mm
6		eShop	eShop	25	30	5.7	71	6	HA		0.2	0.032
8		eShop	eShop	33	40	7.4	80	8	HA		0.2	0.043
10		eShop	eShop	41	50	9.2	95	10	HA		0.2	0.054
12		eShop	eShop	49	60	11	109	12	HA		0.2	0.075
16		eShop	eShop	65	80	15	132	16	HB		0.2	0.096
20		eShop	eShop	82	100	19	154	20	HB		0.2	0.13

Ø h6 Dc	1TX	20 2283	1TX	20 2284	Lc	L1	Ø D1	L	Ø Ds	Shank form	Corner cham- fer width at 45°	TPC Alu hmax
		Solid carbide milling cutter										
		TPC										
mm		DLC		mm	mm	mm	mm	mm			mm	mm
6		eShop	eShop	31	36	5.7	76	6	HA		0.2	0.027
8		eShop	eShop	41	48	7.4	89	8	HA		0.2	0.036
10		eShop	eShop	51	60	9.2	104	10	HA		0.2	0.045
12		eShop	eShop	61	72	11	121	12	HA		0.2	0.063
16		eShop	eShop	81	96	15	148	16	HB		0.2	0.081
20		eShop	eShop	102	120	19	174	20	HB		0.2	0.108

Solid carbide	Type W	3	42°	≠	≠	≠	≠	h6 DIN 6535 HA	G 2.5 "max	HPC
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GARANT Master Alu PickPocket solid carbide roughing end mill HPC

For roughing and finishing.

Up to $2 \times D$ into solid material at very high feed rates and smooth cutting action.

Very high feed rates when plunging vertically.

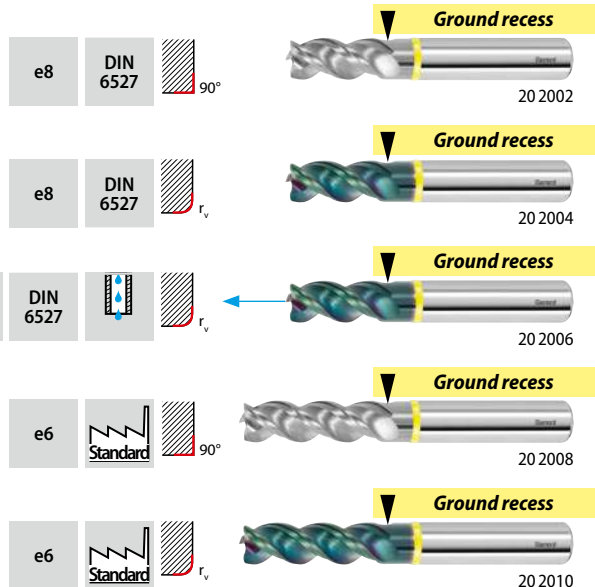
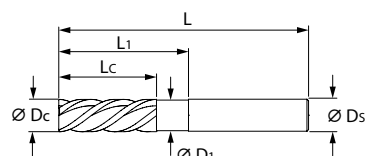
Ramping capability up to 45° .

20 2006 – Improved chip evacuation due to central through-coolant.

Due to the patented geometry also suitable for boring.

20 2004/2006/2010 – With the latest generation of DLC coating sp².

Advantage: Optimised flute form, eccentric relief ground, generous chip spaces.



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
20 2002/2008	250	200	180	180	130	150	130	110								180	120	150					
20 2004/2010	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200					
20 2006	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200					

Ø e8 Dc	20 2002	20 2004	20 2006	Lc	L1	Ø D1	L	Ø Ds	Corner rounding rv	Alu fz	Alu fz
	GARANT Master Alu PickPocket solid carbide roughing end mill										
	HPC										
mm		DLC	DLC	mm	mm	mm	mm	mm	20 2004 20 2006	mm	mm
1,8	eShop	—	—	4	—	—	57	6	—	0.03	0.04
2	eShop	—	—	5	—	—	57	6	—	0.03	0.04
3	eShop	—	—	8	—	—	57	6	—	0.04	0.05
3,8	eShop	eShop	eShop	8	—	—	57	6	0.1	0.04	0.05
4	eShop	eShop	eShop	8	—	—	57	6	0.1	0.05	0.06
4M	eShop	eShop	—	11	17	3.7	57	6	0.1	0.05	0.06
4,8	eShop	eShop	eShop	9	—	—	57	6	0.2	0.05	0.06
5	eShop	eShop	eShop	9	—	—	57	6	0.2	0.06	0.08
5M	eShop	eShop	—	13	19	4.7	57	6	0.2	0.06	0.08
5,7	eShop	eShop	eShop	13	19	5.5	57	6	0.2	0.06	0.08
6	eShop	eShop	eShop	13	19	5.8	57	6	0.2	0.06	0.08
7	eShop	eShop	eShop	16	25	6.8	63	8	0.2	0.07	0.1
7,7	eShop	eShop	eShop	19	25	7.5	63	8	0.2	0.07	0.1
8	eShop	eShop	eShop	19	25	7.8	63	8	0.2	0.08	0.1
8M	eShop	eShop	—	21	25	7.8	63	8	0.2	0.08	0.1
9	eShop	eShop	eShop	22	30	8.8	72	10	0.32	0.08	0.12
9,7	eShop	eShop	eShop	22	30	9.5	72	10	0.32	0.09	0.12
10	eShop	eShop	eShop	22	30	9.8	72	10	0.32	0.09	0.12
11,7	eShop	eShop	eShop	26	36	11.5	83	12	0.32	0.1	0.15
12	eShop	eShop	eShop	26	36	11.8	83	12	0.32	0.1	0.15
14	eShop	eShop	eShop	26	36	13.8	83	14	0.32	0.12	0.17
15,5	eShop	eShop	—	31	42	15.3	92	16	0.32	0.14	0.18
16	eShop	eShop	eShop	31	42	15.8	92	16	0.32	0.14	0.18
16M	eShop	eShop	—	36	42	15.8	92	16	0.2	0.14	0.18
18	eShop	eShop	eShop	31	42	17.8	92	18	0.32	0.16	0.2
20	eShop	eShop	eShop	41	52	19.8	104	20	0.5	0.18	0.22

Ø e6 Dc	20 2008	20 2010	Lc	L1	Ø D1	L	Ø Ds	Corner rounding rv	Alu fz	Alu fz
	GARANT Master Alu PickPocket solid carbide roughing end mill									
	HPC									
mm		DLC	mm	mm	mm	mm	mm	20 2010	mm	mm
6	eShop	eShop	18	24	5.8	62	6	0.2	0.04	0.06
8	eShop	eShop	24	30	7.8	68	8	0.2	0.05	0.07
10	eShop	eShop	30	38	9.8	80	10	0.2	0.06	0.08
12	eShop	eShop	36	46	11.8	93	12	0.2	0.08	0.1
16	eShop	eShop	48	58	15.8	108	16	0.2	0.12	0.14
20	eShop	eShop	60	74	19.8	126	20	0.2	0.16	0.18



GARANT Master Alu PickPocket solid carbide roughing end mill HPC

For roughing and finishing.

Up to 2×D into solid material at very high feed rates and smooth cutting action.

Very high feed rates when plunging vertically.

Ramping capability up to 45°.

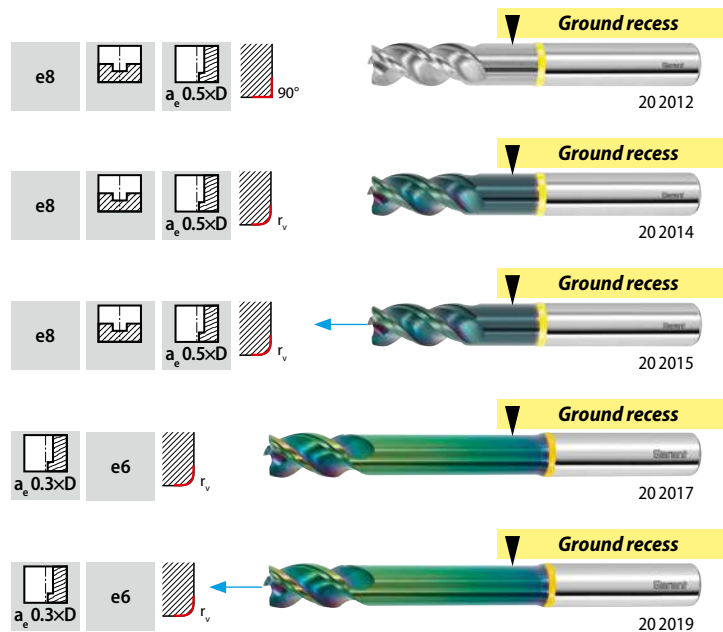
20 2014–2019 – With the latest generation of DLC coating sp².

20 2015/2019 – Improved chip evacuation due to central through-coolant.

20 2017/2019 – Very long overhang for safe machining of deep cavities.

Advantage: Optimised flute form, eccentric relief ground, generous chip spaces.

Note: A minimum oversize of 0.1×D must be maintained for subsequent finishing operations.



Suitable for/ v _c [m/min]	Alu 	Alu 	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey- comb sandwich	Cu	CuZn				
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
20 2012	250	200	180	180	130	150	130	110								180	120	150	●	○	○	●
20 2014	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200	●	○	○	●
20 2015	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200	●	○	○	●
20 2017	380	300	270	180	130	150	130	110		160	150	140	120	150		220	140	160	●	○	○	●
20 2019	380	300	270	180	130	150	130	110		160	150	140	120	150		220	140	160	●	○	○	●

ISO code	20 2012	20 2014	20 2015	L _c	L ₁	Ø D ₁	L	Ø D ₃	Corner rounding r _v	Alu 	Alu
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
6	eShop	eShop	eShop	13	24	5.8	62	6	0.2	0.04	0.06
7	eShop	eShop	—	16	30	6.8	68	8	0.2	0.05	0.07
8	eShop	eShop	eShop	19	30	7.8	68	8	0.2	0.05	0.07
9	eShop	eShop	—	22	38	8.8	80	10	0.32	0.06	0.08
10	eShop	eShop	eShop	22	38	9.8	80	10	0.32	0.06	0.08
12	eShop	eShop	eShop	26	46	11.8	93	12	0.32	0.08	0.1
14	eShop	eShop	—	26	52	13.8	99	14	0.32	0.1	0.12
16	eShop	eShop	eShop	31	58	15.8	108	16	0.32	0.12	0.14
18	eShop	eShop	—	31	67	17.8	117	18	0.32	0.14	0.16
20	eShop	eShop	eShop	41	74	19.8	126	20	0.5	0.2	0.22

ISO code	20 2017	20 2019	L _c	L ₁	Ø D ₁	L	Ø D ₃	Corner rounding r _v	Alu 	Alu
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4	eShop	—	6.5	24	3.7	80	6	0.1	0.03	0.04
5	eShop	—	8	30	4.7	80	6	0.1	0.04	0.06
6	eShop	eShop	10	42	5.7	80	6	0.2	0.04	0.06
8	eShop	eShop	13	62	7.4	100	8	0.2	0.05	0.07
10	eShop	eShop	16	58	9.2	100	10	0.2	0.05	0.07
12	eShop	eShop	19	73	11	120	12	0.2	0.06	0.08
16	eShop	eShop	25	100	15	150	16	0.2	0.08	0.1
20	eShop	—	32	98	19	150	20	0.2	0.12	0.15



Solid carbide mini milling cutter

Shank similar to **DIN 6535 HB**.

20 2260/2264 – Improved coating for general-purpose applications in steel and cast iron.



202260_3



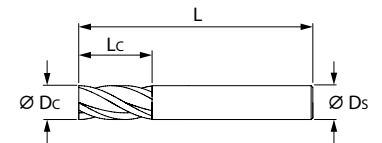
202262_3



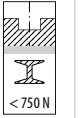
202264_3



202266_3



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 2260/2264	280	200	120	110	100	70	60							70	50		90	●	●	●	●	●	●
20 2262/2266	170	140	100	70	60	45								40			55	○	○	○	○	○	○

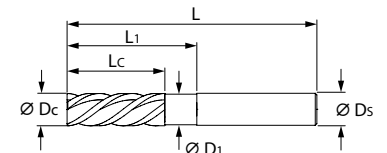
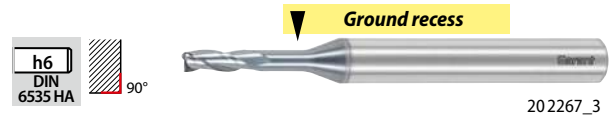
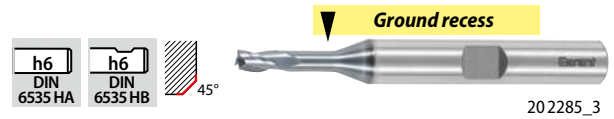
Ø e8 D _c	11X 20 2260 Garant	12X 20 2262 HOLEX	11X 20 2264 Garant	12X 20 2266 HOLEX	L _c	L	Ø D _s	Shank form	Corner chamfer width at 45°	 f _z	 f _z
mm	AlCrN	uncoated	AlCrN	uncoated	mm	mm	mm		mm	mm	mm
0,5	eShop	eShop	eShop	eShop	1.5	38	3	HA	—	0.003	0.003
0,6	eShop	eShop	eShop	eShop	1.5	38	3	HA	—	0.003	0.003
0,8	eShop	eShop	eShop	eShop	2	38	3	HA	—	0.003	0.003
1	eShop	eShop	eShop	eShop	2	38	3	HA	0.1	0.005	0.006
1,1	eShop	eShop	eShop	eShop	2	38	3	HA	0.1	0.005	0.006
1,2	eShop	eShop	eShop	eShop	2	38	3	HA	0.1	0.005	0.006
1,3	eShop	eShop	eShop	eShop	3	38	3	HA	0.1	0.005	0.006
1,5	eShop	eShop	eShop	eShop	3	38	3	HA	0.1	0.005	0.006
1,6	eShop	eShop	eShop	eShop	3	38	3	HA	0.1	0.005	0.006
1,7	eShop	eShop	eShop	eShop	3	38	3	HA	0.1	0.005	0.006
1,8	eShop	eShop	eShop	eShop	3	38	3	HA	0.1	0.005	0.006
1,9	eShop	eShop	eShop	eShop	4	38	3	HA	0.1	0.005	0.006
2	eShop	eShop	eShop	eShop	4	45	6	HB	0.1	0.01	0.011
2,5	eShop	eShop	eShop	eShop	4	45	6	HB	0.1	0.01	0.011
2,8	eShop	—	—	—	5	45	6	HB	0.13	0.02	0.025
3	eShop	eShop	eShop	eShop	5	45	6	HB	0.13	0.02	0.025
3,5	eShop	eShop	eShop	eShop	5	45	6	HB	0.13	0.02	0.025
3,8	eShop	—	—	—	7	45	6	HB	0.18	0.02	0.025
4	eShop	eShop	eShop	eShop	7	45	6	HB	0.18	0.02	0.025
4,5	eShop	eShop	eShop	eShop	7	45	6	HB	0.18	0.02	0.025
4,8	eShop	—	—	—	8	45	6	HB	0.2	0.03	0.04
5	eShop	eShop	eShop	eShop	8	45	6	HB	0.2	0.03	0.04
5,5	eShop	eShop	eShop	eShop	8	45	6	HB	0.2	0.03	0.04
5,75	eShop	eShop	eShop	eShop	8	45	6	HB	0.2	0.03	0.04
6	eShop	eShop	eShop	eShop	8	45	6	HB	0.2	0.04	0.05
6,75	eShop	eShop	eShop	eShop	10	55	8	HB	0.2	0.04	0.05
7	eShop	eShop	eShop	eShop	10	55	8	HB	0.2	0.04	0.05
7,75	eShop	eShop	eShop	eShop	10	55	8	HB	0.2	0.04	0.05
8	eShop	eShop	eShop	eShop	11	55	8	HB	0.2	0.05	0.08
8,7	eShop	eShop	eShop	eShop	11	55	10	HB	0.3	0.05	0.08
9	eShop	eShop	eShop	eShop	11	55	10	HB	0.3	0.05	0.08
9,7	eShop	eShop	eShop	eShop	11	55	10	HB	0.3	0.05	0.08
10	eShop	eShop	eShop	eShop	13	55	10	HB	0.3	0.06	0.09
11	eShop	—	—	—	15	60	12	HB	0.3	0.06	0.09
12	eShop	eShop	eShop	eShop	15	60	12	HB	0.3	0.07	0.1
14	eShop	eShop	eShop	eShop	15	60	14	HB	0.3	0.07	0.1
16	eShop	eShop	eShop	eShop	18	65	16	HB	0.4	0.08	0.13
20	eShop	eShop	eShop	eShop	22	75	20	HB	0.5	0.1	0.15



Solid carbide milling cutter

Dimensions similar to **DIN 6527**.

Improved coating for general-purpose applications in steel and cast iron.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K						
20 2267/2285		280	200	120	110	100	70	60					70	50		90						
20 2275		200	160	100	80	70	50						60	40		75						

Ø e8 D _c	1X 20 2285	1X 20 2267	12X 20 2275	L _c		L ₁		Ø D ₁	L			Ø D _s	Shank form	Corner chamfer width at 45°			 < 750 N f _z	 < 750 N f _z	
	Garant																		HOLEX
	Solid carbide milling cutter																		
mm	AlCrN	AlCrN	AlCrN	20 2285	20 2267 20 2275	20 2285	20 2267	20 2285 20 2267	20 2285	20 2267 20 2275	mm	20 2285	20 2285	20 2275	mm	mm			
1	eShop	eShop	—	3	3	—	—	—	38	50	3	HA	0.1	—	0.005	0.006			
1,2	eShop	eShop	—	3	4	—	—	—	38	50	3	HA	0.1	—	0.005	0.006			
1,5	eShop	eShop	—	3	4	—	—	—	38	50	3	HA	0.1	—	0.005	0.006			
1,8	eShop	eShop	—	3	5	—	—	—	38	50	3	HA	0.1	—	0.005	0.006			
2	eShop	eShop	—	4	5	—	15	1.8	38	50	3	HA	0.1	—	0.01	0.011			
2,5	eShop	eShop	—	4	6	10	15	2.3	50	50	6	HB	0.1	—	0.01	0.011			
2,8	—	eShop	—	—	8	—	15	2.6	—	57	6	—	—	—	0.02	0.025			
3	eShop	eShop	eShop	5	8	12	15	2.8	50	57	6	HB	0.1	0.13	0.02	0.025			
3,5	eShop	eShop	eShop	6	11	13	15	3.3	54	57	6	HB	0.1	0.13	0.02	0.025			
3,8	—	eShop	—	—	11	—	15	3.6	—	57	6	—	—	—	0.02	0.025			
4	eShop	eShop	eShop	8	11	15	15	3.8	54	57	6	HB	0.1	0.18	0.02	0.025			
4,5	eShop	eShop	eShop	9	13	15	21	4.3	54	57	6	HB	0.1	0.18	0.02	0.025			
4,8	—	eShop	—	—	13	—	21	4.6	—	57	6	—	—	—	0.03	0.04			
5	eShop	eShop	eShop	9	13	16	21	4.8	54	57	6	HB	0.1	0.2	0.03	0.04			
5,5	eShop	eShop	eShop	10	13	17	21	5.3	54	57	6	HB	0.1	0.2	0.03	0.04			
5,75	eShop	eShop	eShop	10	13	17	21	5.55	54	57	6	HB	0.1	0.2	0.03	0.04			
6	eShop	eShop	eShop	10	13	17	21	5.8	54	57	6	HB	0.1	0.2	0.04	0.05			
6,5	—	eShop	eShop	—	16	—	27	6.3	—	63	8	—	—	0.2	0.04	0.05			
7	—	eShop	eShop	—	16	—	27	6.8	—	63	8	—	—	0.2	0.04	0.05			
7,5	—	eShop	eShop	—	19	—	27	7.3	—	63	8	—	—	0.2	0.04	0.05			
8	eShop	eShop	eShop	12	19	20	27	7.8	58	63	8	HB	0.1	0.2	0.05	0.08			
8,5	—	eShop	eShop	—	19	—	32	8.3	—	72	10	—	—	0.3	0.05	0.08			
9	—	eShop	eShop	—	19	—	32	8.8	—	72	10	—	—	0.3	0.05	0.08			
9,5	—	eShop	eShop	—	22	—	32	9.3	—	72	10	—	—	0.3	0.05	0.08			
10	eShop	eShop	eShop	14	22	24	32	9.8	66	72	10	HB	0.1	0.3	0.06	0.09			
11	—	eShop	—	—	26	—	38	10.8	—	83	12	—	—	—	0.06	0.09			
12	eShop	eShop	eShop	16	26	26	38	11.8	73	83	12	HB	0.1	0.3	0.07	0.1			
14	eShop	eShop	eShop	18	26	28	38	13.8	75	83	14	HB	0.1	0.3	0.07	0.1			
16	eShop	eShop	eShop	22	32	32	44	15.7	82	92	16	HB	0.1	0.4	0.08	0.13			
18	eShop	eShop	eShop	24	32	34	44	17.7	84	92	18	HB	0.1	0.4	0.09	0.15			
20	eShop	eShop	eShop	26	38	40	54	19.7	92	104	20	HB	0.1	0.5	0.1	0.15			



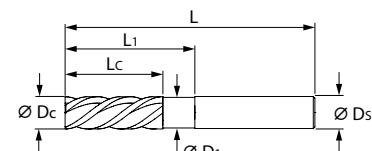
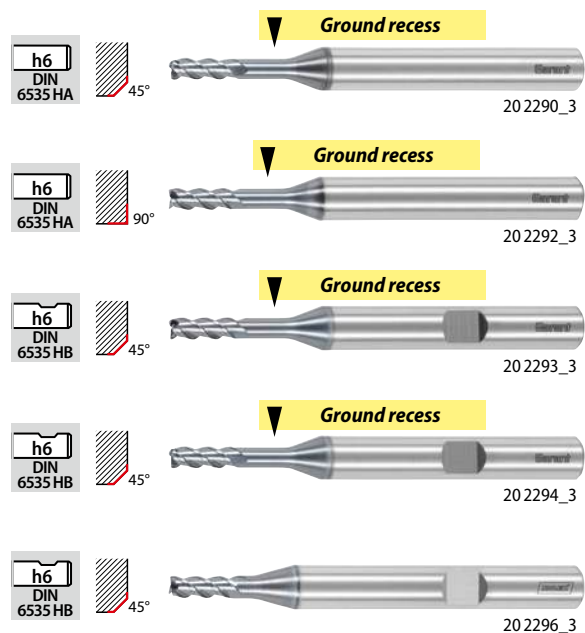
Solid carbide milling cutter

Dimensions similar to **DIN 6527**.

Improved coating for general-purpose applications in steel and cast iron.

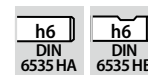
Note:

20 2293 – **Successor product to No. 202320.**



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 2290–20 2294		280	200	120	110	100	70	60						70	50		90	●	●	●	●	●	●
20 2296		200	160	100	80	70	50							60	40		75	○	○	○	○	○	○

Ø e8 D _c	11X 20 2290	11X 20 2292	11X 20 2293	11X 20 2294	12X 20 2296	L _c	L ₁	Ø D ₁	L	Ø D _s	Shank form	Corner chamfer width at 45°	f _z	f _z
	Garant				HOLEX									
	Solid carbide milling cutter													
mm	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	mm	mm	mm	mm	mm		mm	mm	mm
1	eShop	eShop	—	—	—	3	—	—	50	3	—	0.1	—	0.005
1,2	eShop	eShop	—	—	—	4	—	—	50	3	—	0.1	—	0.005
1,5	eShop	eShop	—	—	—	4	—	—	50	3	—	0.1	—	0.005
1,8	eShop	eShop	—	—	—	5	—	—	50	3	—	0.1	—	0.005
2	eShop	eShop	—	—	—	5	15	1.8	50	3	—	0.1	—	0.01
2,5	eShop	eShop	—	eShop	—	6	15	2.3	50	6	HB	0.1	—	0.01
3	eShop	eShop	eShop	eShop	eShop	8	15	2.8	57	6	HB	0.13	0.1	0.02
3,5	eShop	eShop	eShop	eShop	eShop	11	15	3.3	57	6	HB	0.13	0.1	0.02
4	eShop	eShop	eShop	eShop	eShop	11	15	3.8	57	6	HB	0.18	0.1	0.02
4,5	eShop	eShop	eShop	eShop	eShop	13	21	4.3	57	6	HB	0.18	0.1	0.02
5	eShop	eShop	eShop	eShop	eShop	13	21	4.8	57	6	HB	0.2	0.1	0.03
5,5	eShop	eShop	eShop	eShop	eShop	13	21	5.3	57	6	HB	0.2	0.1	0.03
5,75	eShop	eShop	eShop	eShop	eShop	13	21	5.55	57	6	HB	0.2	0.1	0.03
6	eShop	eShop	eShop	eShop	eShop	13	21	5.8	57	6	HB	0.2	0.1	0.04
6,5	eShop	eShop	eShop	eShop	eShop	16	27	6.3	63	8	HB	0.2	0.1	0.04
7	eShop	eShop	eShop	eShop	eShop	16	27	6.8	63	8	HB	0.2	0.1	0.04
7,5	eShop	eShop	eShop	eShop	eShop	19	27	7.3	63	8	HB	0.2	0.1	0.04
8	eShop	eShop	eShop	eShop	eShop	19	27	7.8	63	8	HB	0.2	0.1	0.05
8,5	eShop	eShop	eShop	eShop	eShop	19	32	8.3	72	10	HB	0.3	0.1	0.05
9	eShop	eShop	eShop	eShop	eShop	19	32	8.8	72	10	HB	0.3	0.1	0.05
9,5	eShop	eShop	eShop	eShop	eShop	22	32	9.3	72	10	HB	0.3	0.1	0.05
10	eShop	eShop	eShop	eShop	eShop	22	32	9.8	72	10	HB	0.3	0.1	0.06
12	eShop	eShop	eShop	eShop	eShop	26	38	11.8	83	12	HB	0.3	0.1	0.07
14	eShop	eShop	eShop	eShop	eShop	26	38	13.8	83	14	HB	0.3	0.1	0.07
16	eShop	eShop	eShop	eShop	eShop	32	44	15.7	92	16	HB	0.4	0.1	0.08
18	eShop	eShop	eShop	eShop	eShop	32	44	17.7	92	18	HB	0.4	0.1	0.09
20	eShop	eShop	eShop	eShop	eShop	38	54	19.7	104	20	HB	0.5	0.1	0.1



Solid carbide milling cutter

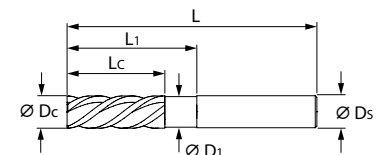
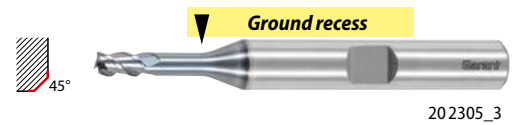
Dimensions similar to **DIN 6527**.

20 2305 – Improved coating for general-purpose applications in steel and cast iron.

Note:

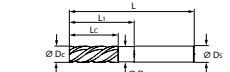
20 2305 – **Successor product to No. 202210.**

20 2307 – **Successor product to No. 202240 / 202245.**



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 2299/2307	170	140	100	70	60	45	70	60						40	50		55	○	●	●	●	●	●
20 2305	280	200	120	110	100	70	60							70	50		90	●	●	●	●	●	●

Ø e8 D _c	11X	20 2305	12X	20 2299	12X	20 2307	L _c		L ₁	Ø D ₁	L		Ø D ₃	Shank form	Corner chamfer width at 45°			
	Solid carbide milling cutter						20 2305	20 2299 20 2307	20 2305	20 2305	20 2305	20 2299 20 2307			20 2305	20 2299	f _z	f _z
	mm	AlCrN					mm	mm	mm	mm	mm	mm	mm		mm	mm	mm	mm
1	eShop	eShop	eShop				3	3	–	–	38	50	3	HA	0.1	0.1	0.005	0.006
1,2	eShop	eShop	eShop				3	4	–	–	38	50	3	HA	0.1	0.1	0.005	0.006
1,5	eShop	eShop	eShop				3	4	–	–	38	50	3	HA	0.1	0.1	0.005	0.006
1,8	eShop	eShop	eShop				3	5	–	–	38	50	3	HA	0.1	0.1	0.005	0.006
2	eShop	eShop	eShop				4	5	–	–	38	50	3	HA	0.1	0.1	0.01	0.011
2,5	eShop	eShop	eShop				4	6	10	2.3	50	50	6	HB	0.1	0.1	0.01	0.011
3	eShop	eShop	eShop				5	8	12	2.8	50	57	6	HB	0.1	0.13	0.02	0.025
3,5	eShop	eShop	eShop				6	11	13	3.3	54	57	6	HB	0.1	0.13	0.02	0.025
4	eShop	eShop	eShop				8	11	15	3.8	54	57	6	HB	0.1	0.18	0.02	0.025
4,5	eShop	eShop	eShop				9	13	15	4.3	54	57	6	HB	0.1	0.18	0.02	0.025
5	eShop	eShop	eShop				9	13	16	4.8	54	57	6	HB	0.1	0.2	0.03	0.04
5,5	eShop	eShop	eShop				10	13	17	5.3	54	57	6	HB	0.1	0.2	0.03	0.04
5,75	eShop	eShop	eShop				10	13	17	5.55	54	57	6	HB	0.1	0.2	0.03	0.04
6	eShop	eShop	eShop				10	13	17	5.8	54	57	6	HB	0.1	0.2	0.04	0.05
6,5	–	–	eShop				–	16	–	–	–	63	8	HB	–	–	0.04	0.05
7	–	–	eShop				–	16	–	–	–	63	8	HB	–	–	0.04	0.06
7,5	–	–	eShop				–	19	–	–	–	63	8	HB	–	–	0.05	0.07
8	eShop	eShop	eShop				12	19	20	7.8	58	63	8	HB	0.1	0.2	0.05	0.08
8,5	–	–	eShop				–	19	–	–	–	72	10	HB	–	–	0.05	0.08
9	–	–	eShop				–	19	–	–	–	72	10	HB	–	–	0.05	0.08
9,5	–	–	eShop				–	22	–	–	–	72	10	HB	–	–	0.06	0.09
10	eShop	eShop	eShop				14	22	24	9.8	66	72	10	HB	0.1	0.3	0.06	0.09
12	eShop	eShop	eShop				16	26	26	11.8	73	83	12	HB	0.1	0.3	0.07	0.1
14	eShop	eShop	eShop				18	26	28	13.8	75	83	14	HB	0.1	0.3	0.07	0.1
16	eShop	eShop	eShop				22	32	32	15.7	82	92	16	HB	0.1	0.4	0.08	0.13
18	eShop	eShop	eShop				24	32	34	17.7	84	92	18	HB	0.1	0.4	0.09	0.15
20	eShop	eShop	eShop				26	38	40	19.7	92	104	20	HB	0.1	0.5	0.1	0.15



Garant GARANT Master INOX solid carbide milling cutter HPC

For roughing and finishing

HPC milling cutters with newly developed high-performance coating for outstanding service life and optimum metal removal rates in a wide range of stainless steels.

Greater oxidation resistance and high-temperature hardness.

Can be used at high cutting speeds, particularly suitable even for TOOLOX®.

20 2387 – Dimensions similar to DIN 6527.



20 2387

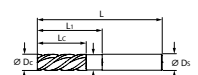
Ground recess



20 2389

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M						
20 2387				250	230	200	170	170						115	80	110	90	○					
20 2389				240	220	180	150	150						115	80	100	85	○					

Ø h10 D _c	11X	20 2387	11X	20 2389	L _c		L ₁		Ø D ₁	L		Ø D _s	Corner chamfer width at 45°		
	GARANT Master INOX solid carbide milling cutter													INOX	INOX
	HPC				20 2387	20 2389	20 2387	20 2389		20 2387	20 2389			> 900 N	> 900 N
	mm	TiAlN		TiAlN	mm	mm	mm	mm	mm	mm	mm	mm		mm	f _t
1	eShop		eShop	2.5	3	5	13	0.9	57	57	6	0.05	0.01	0.012	
1,5	eShop		—	4	—	7.5	—	1.44	57	—	6	0.05	0.01	0.012	
2	eShop		eShop	5	5	10	15	1.92	57	57	6	0.05	0.02	0.024	
2,5	eShop		—	6	—	12.5	—	2.4	57	—	6	0.05	0.02	0.024	
3	eShop		eShop	8	8	15	20	2.9	57	57	6	0.05	0.02	0.024	
3,5	eShop		—	11	—	16	—	3.4	57	—	6	0.05	0.02	0.024	
4	eShop		eShop	11	16	16	24	3.9	57	62	6	0.1	0.02	0.024	
4,5	eShop		—	13	—	19	—	4.4	57	—	6	0.1	0.04	0.048	
5	eShop		eShop	13	17	19	24	4.9	57	62	6	0.1	0.04	0.048	
5,5	eShop		—	13	—	19	—	5.4	57	—	6	0.1	0.04	0.048	
6	eShop		eShop	13	18	19	24	5.9	57	62	6	0.1	0.04	0.048	
7	eShop		—	19	—	25	—	6.8	63	—	8	0.1	0.04	0.048	
7,5	eShop		—	19	—	25	—	7.3	63	—	8	0.1	0.04	0.048	
8	eShop		eShop	19	24	25	30	7.8	63	70	8	0.1	0.04	0.048	
9	eShop		—	22	—	30	—	8.7	72	—	10	0.1	0.06	0.072	
10	eShop		eShop	22	30	30	38	9.7	72	80	10	0.1	0.06	0.072	
12	eShop		eShop	26	36	36	46	11.7	83	93	12	0.1	0.06	0.072	
14	eShop		—	26	—	36	—	13.7	83	—	14	0.15	0.08	0.096	
16	eShop		eShop	32	48	42	58	15.5	92	108	16	0.2	0.08	0.096	
20	eShop		eShop	38	60	52	74	19.5	104	124	20	0.2	0.1	0.12	



HOLEX HOLEX Pro INOX solid carbide milling cutter HPC

HPC milling cutter with newly developed high-performance coating for outstanding tool life

and optimum metal removal rate in a wide range of stainless steels.

Can be used at high cutting speeds, highly suitable even for steels up to approx. 1100 N/mm².



20 2378

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M						
20 2378				240	220	180	180	150						115	80	100	85	○					
20 2382				215	200	160	160	135						100	70	90	75	○					

Ø e8 D _c	20 2378	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	INOX > 900 N	INOX > 900 N
mm	AlCrN	mm	mm	mm	mm	mm	mm	f _t	f _t
3	eShop	8	13	2.8	57	6	0.1	0.012	0.015
4	eShop	11	17	3.8	57	6	0.1	0.012	0.015
5	eShop	13	19	4.8	57	6	0.1	0.025	0.025
6	eShop	13	19	5.8	57	6	0.1	0.025	0.03
7	eShop	21	25	6.7	63	8	0.2	0.025	0.04
8	eShop	21	25	7.7	63	8	0.2	0.025	0.04
9	eShop	22	30	8.7	72	10	0.2	0.04	0.045
10	eShop	22	30	9.7	72	10	0.2	0.04	0.045
12	eShop	26	36	11.6	83	12	0.3	0.04	0.05
16	eShop	36	42	15.5	92	16	0.3	0.05	0.055
20	eShop	41	52	19.5	104	20	0.3	0.07	0.08

Solid carbide	Type N	f8					
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Garant Solid carbide milling cutter MTC

Special flute profile. Strengthened core.

MTC rough milling up to 1.5×D in solid material.

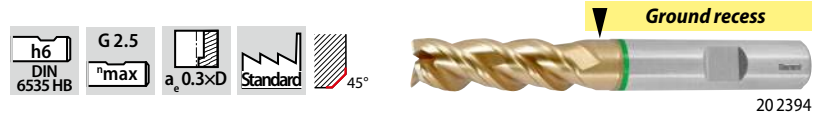
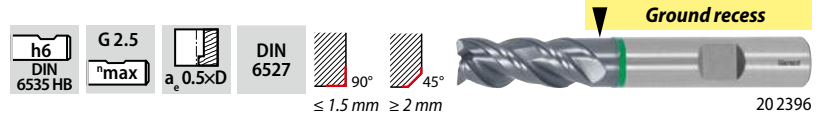
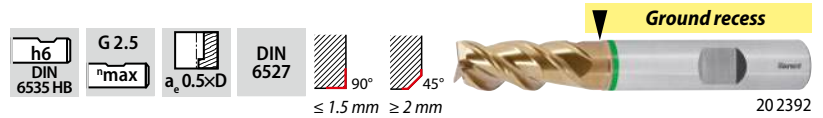
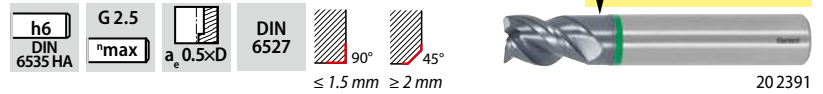
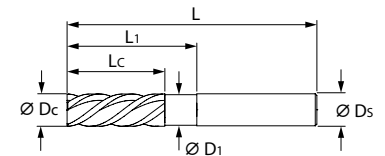
Eccentric relief ground.

20 2391 – Particularly sturdy due to short overall length. Overall length similar to **DIN 6527 short**.

20 2396/2399 – Improved coating for a further reduction in cutting force combined with increased tool life.

20 2392/2396 – Lengths similar to **DIN 6527 long**.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

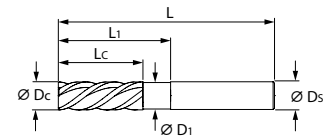


Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 2391–20 2399				250	220	200	190	170	90	60				130	100	50	160						

Ø f8 D _c	11X	20 2391	11X	20 2392	11X	20 2396	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°		
Solid carbide milling cutter														
MTC						20 2391	20 2392	20 2391	20 2392	20 2391	20 2392	20 2391	20 2392	20 2396
mm		AlCrN		SiTiN		AlCrN	mm	mm	mm	mm	mm	mm	mm	mm
1		–		eShop		eShop	–	2.5	–	5	–	0.95	–	57
1.5		eShop		eShop		eShop	3	4	–	7.5	–	1.44	38	57
2		eShop		eShop		eShop	4	5	–	10	–	1.92	38	57
2.5		eShop		eShop		eShop	4	6.5	10	12.5	2.3	2.4	50	57
3		eShop		eShop		eShop	5	8	12	15	2.8	2.9	50	57
3.5		eShop		eShop		eShop	6	11	13	16	3.3	3.4	54	57
4		eShop		eShop		eShop	8	11	15	16	3.8	3.9	54	57
4.5		eShop		eShop		eShop	9	13	15	19	4.3	4.4	54	57
5		eShop		eShop		eShop	9	13	16	19	4.8	4.9	54	57
5.5		eShop		eShop		eShop	10	13	17	19	5.3	5.4	54	57
6		eShop		eShop		eShop	12	13	17	19	5.8	5.9	54	57
6.5		–		eShop		eShop	–	19	–	25	–	6.3	–	63
7		–		eShop		eShop	–	19	–	25	–	6.8	–	63
7.5		–		eShop		eShop	–	19	–	25	–	7.3	–	63
8		eShop		eShop		eShop	12	19	20	25	7.8	7.8	58	63
8.5		–		eShop		eShop	–	22	–	30	–	8.2	–	72
9		–		eShop		eShop	–	22	–	30	–	8.7	–	72
9.5		–		eShop		eShop	–	22	–	30	–	9.2	–	72
10		eShop		eShop		eShop	14	22	24	30	9.8	9.7	66	72
12		eShop		eShop		eShop	16	26	26	36	11.8	11.7	73	83
14		–		eShop		eShop	–	26	–	36	–	13.7	–	83
16		–		eShop		eShop	–	32	–	42	–	15.5	–	92
20		–		eShop		eShop	–	38	–	52	–	19.5	–	104

Ø f8 D _c	11X	20 2394	11X	20 2399	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°		
Solid carbide milling cutter												
MTC												
mm		SiTiN		AlCrN	mm	mm	mm	mm	mm	mm	mm	mm
4		eShop		eShop	16	24	3.9	62	6	0.1	0.02	0.024
5		eShop		eShop	17	24	4.9	62	6	0.1	0.04	0.048
6		eShop		eShop	18	24	5.9	62	6	0.2	0.04	0.048
8		eShop		eShop	24	30	7.8	68	8	0.2	0.04	0.048
10		eShop		eShop	30	38	9.7	80	10	0.2	0.06	0.072
12		eShop		eShop	36	46	11.7	93	12	0.2	0.06	0.072
16		eShop		eShop	48	58	15.5	108	16	0.2	0.08	0.096
20		eShop		eShop	60	74	19.5	126	20	0.2	0.1	0.12

Solid carbide	Type N	f8	3	38°	≠	≠	≠	≠	h6 DIN 6535 HB	HPC
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GARANT Master Steel PickPocket solid carbide roughing end mill HPC

For roughing and finishing

With corner radii similar to torus cutters.

Up to 1×D into solid material **at very high feed rates** with smooth cutting action.

20 2402 – Corner radii matched to DIN specifications for **drive keyways**.

Advantage: Optimised flute form, eccentric relief ground, wide chip space.



20 2402



20 2404



20 2406

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 2402–20 2406				260	240	190	180	150					80	70		250	●		●	○	●	●

Ø f8 D _c	20 2402	20 2404	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner rounding r _v	f _z	f _z
mm	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm
3,8	eShop	eShop	5	10	—	54	57	6	0.12	0.03
4	eShop	eShop	5	11	—	54	57	6	0.12	0.03
4,8	eShop	eShop	6	11	—	54	57	6	0.2	0.04
5	eShop	eShop	6	13	—	54	57	6	0.2	0.04
5,7	eShop	eShop	7	13	19	54	57	6	0.2	0.04
6	eShop	eShop	7	13	19	54	57	6	0.2	0.04
6,7	eShop	eShop	8	16	25	58	63	8	0.2	0.04
7	eShop	eShop	8	16	25	58	63	8	0.2	0.04
7,7	eShop	eShop	9	19	25	58	63	8	0.2	0.05
8	eShop	eShop	9	19	25	58	63	8	0.2	0.05
8,7	—	eShop	—	22	30	—	72	10	—	0.06
9	eShop	eShop	10	22	30	66	72	10	0.32	0.06
9,7	eShop	eShop	11	22	30	66	72	10	0.32	0.06
10	eShop	eShop	11	22	30	66	72	10	0.32	0.06
11,7	eShop	eShop	12	26	36	73	83	12	0.32	0.07
12	eShop	eShop	12	26	36	73	83	12	0.32	0.07
13,7	—	eShop	—	26	36	—	83	14	—	0.08
14	eShop	eShop	14	26	36	75	83	14	0.32	0.08
15,5	eShop	eShop	16	31	42	82	92	16	0.32	0.08
16	eShop	eShop	16	31	42	82	92	16	0.32	0.08
17,5	—	eShop	—	31	42	—	92	18	—	0.1
18	—	eShop	—	31	42	—	92	18	—	0.1
19,5	—	eShop	—	41	52	—	104	20	—	0.1
20	eShop	eShop	20	41	52	92	104	20	0.5	0.1

Ø f8 D _c	20 2406	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner rounding r _v	f _z	f _z
mm	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm
5,7	eShop	13	24	5.5	62	6	0.29	0.04	0.05
6	eShop	13	24	5.8	62	6	0.3	0.04	0.05
6,7	eShop	16	30	6.4	68	8	0.34	0.04	0.05
7	eShop	16	30	6.7	68	8	0.35	0.04	0.05
7,7	eShop	21	30	7.4	68	8	0.39	0.05	0.06
8	eShop	21	30	7.7	68	8	0.4	0.05	0.06
8,7	eShop	22	38	8.4	80	10	0.44	0.06	0.08
9	eShop	22	38	8.7	80	10	0.45	0.06	0.08
9,7	eShop	22	38	9.4	80	10	0.49	0.06	0.08
10	eShop	22	38	9.7	80	10	0.5	0.06	0.08
11,7	eShop	26	46	11.3	93	12	0.59	0.07	0.09
12	eShop	26	46	11.6	93	12	0.6	0.07	0.09
14	eShop	26	52	13.6	99	14	0.7	0.08	0.1
15,5	eShop	36	58	15	108	16	0.78	0.08	0.1
16	eShop	36	58	15.5	108	16	0.8	0.08	0.1
18	eShop	36	67	17.5	117	18	0.9	0.1	0.13
20	eShop	41	74	19.5	126	20	1	0.1	0.13

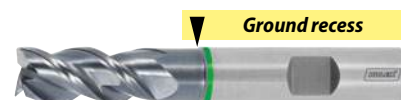
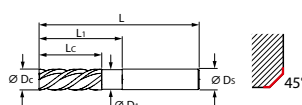


HOLEX **HOLEX Pro Steel solid carbide roughing end mill HPC**

For **roughing and finishing.**

Up to $1 \times D$ into solid material **at very high feed rates** with smooth cutting action.

Advantage: Optimised flute form, eccentric relief ground, wide chip space.



202414

Suitable for/ v_c [m/min]	Alu plastics 	Alu Austenitic Si 	> 10 % Si											INOX	INOX	Ti	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	190	●	●	○	●	●
	202414			240	220	170	150							80									

Ø D _c	12X	20 2414	L _c	L ₁	Ø D ₁	L	Ø D ₅	Corner chamfer width at 45°		
	HOLEX Pro Steel solid carbide roughing end mill									
	HPC	< 900 N							< 900 N	
mm	TiAlN		mm	mm	mm	mm	mm	mm	f _z	f _z
3	eShop		8	12	2.8	57	6	0.13	0.02	0.025
4	eShop		11	15	3.8	57	6	0.18	0.02	0.025
5	eShop		13	17	4.8	57	6	0.2	0.04	0.05
5,7	eShop		13	21	5.2	57	6	0.2	0.04	0.05
6	eShop		13	21	5.5	57	6	0.2	0.04	0.05
7,7	eShop		19	27	7.2	63	8	0.2	0.05	0.06
8	eShop		19	27	7.5	63	8	0.2	0.05	0.06
9,7	eShop		22	32	9.2	72	10	0.3	0.06	0.08
10	eShop		22	32	9.5	72	10	0.3	0.06	0.08
11,7	eShop		26	38	11.2	83	12	0.3	0.07	0.09
12	eShop		26	38	11.5	83	12	0.3	0.07	0.09
14	eShop		26	42	13.5	83	14	0.3	0.08	0.1
15,6	eShop		32	44	15.1	92	16	0.4	0.08	0.1
16	eShop		32	44	15.5	92	16	0.4	0.08	0.1
17,5	eShop		32	50	17	92	18	0.4	0.1	0.13
18	eShop		32	50	17.5	92	18	0.4	0.1	0.13
20	eShop		38	54	19.5	104	20	0.5	0.1	0.13

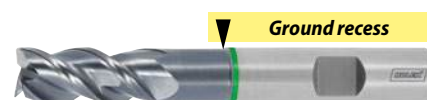
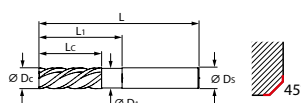


HOLEX HOLEX Pro Steel solid carbide roughing end mill HPC

For **roughing and finishing.**

Up to $0.7 \times D$ into solid material **at very high feed rates** with smooth cutting action.

Advantage: Optimised flute form, eccentric relief ground, wide chip space.



202416

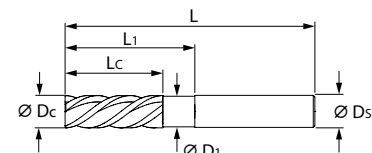
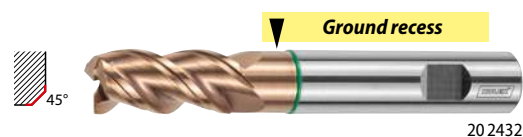
Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 											INOX	INOX	Ti	GGG	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	190					
20 2416				240	220	170	150							80									

Ø D _c	12X 20 2416	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	 f _z	 f _z
	HOLEX Pro Steel solid carbide roughing end mill								
	HPC								
mm	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm
5	eShop	13	25	4.8	62	6	0.2	0.03	0.05
5,7	eShop	13	25	5.2	62	6	0.2	0.03	0.05
6	eShop	13	25	5.5	62	6	0.2	0.03	0.05
7,7	eShop	19	32	7.2	68	8	0.2	0.04	0.06
8	eShop	19	32	7.5	68	8	0.2	0.04	0.06
9,7	eShop	22	40	9.2	80	10	0.3	0.05	0.08
10	eShop	22	40	9.5	80	10	0.3	0.05	0.08
11,7	eShop	26	48	11.2	93	12	0.3	0.06	0.09
12	eShop	26	48	11.5	93	12	0.3	0.06	0.09
15,6	eShop	32	56	15.1	108	16	0.4	0.07	0.1
16	eShop	32	56	15.5	108	16	0.4	0.07	0.1
19,5	eShop	38	70	19	126	20	0.5	0.09	0.13
20	eShop	38	70	19.5	126	20	0.5	0.09	0.13



MOLEX Pro UNI solid carbide milling cutters, HPC

For **roughing at very high feed rates** with smooth cutting action.
Innovative geometry and high-performance coating for outstanding production results and tool life in a variety of materials.
 Unequal spacing gives **high intrinsic stability** and smooth cutting action.



Suitable for/ v _c [m/min]	Alu plastics	Alu 	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 2432		250		240	220	180	170	140						90	80	35	240	●		●	○	●	●

Ø e8 D _c	12Y	20 2432	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	 Pro UNI solid carbide milling cutter HPC TiSiN f _z	 INOX f _z	 INOX f _z	 INOX f _z
mm			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1		eShop	2.5	5	0.9	57	6	0.06	0.009	0.005	0.012	0.009
2		eShop	5	10	1.9	57	6	0.06	0.012	0.008	0.015	0.011
3		eShop	8	13	2.8	57	6	0.06	0.02	0.012	0.025	0.015
4		eShop	11	17	3.8	57	6	0.08	0.02	0.012	0.025	0.015
5		eShop	13	19	4.8	57	6	0.1	0.03	0.025	0.04	0.03
6		eShop	13	19	5.8	57	6	0.1	0.04	0.025	0.05	0.03
8		eShop	21	25	7.7	63	8	0.2	0.05	0.025	0.06	0.03
10		eShop	22	30	9.7	72	10	0.2	0.06	0.04	0.08	0.05
12		eShop	26	36	11.6	83	12	0.3	0.07	0.04	0.09	0.05
16		eShop	36	42	15.5	92	16	0.3	0.08	0.05	0.1	0.06
20		eShop	41	52	19.5	104	20	0.3	0.1	0.07	0.12	0.08

Garant

PPC – PARABOLIC PERFORMANCE CUTTING

Dynamic 5-axis milling.
 Reduce process times and increase surface quality.

PPC milling cutter
 conical shape
 No. 20 7530 12/500
 $D_c = 12$ mm
 $R_2 = 500$ mm



Advantages of the PPC process:

- Shorter machining times due to the large stepover.
- Lower set-up costs.
- Higher surface qualities at shorter cycle times.
- Outstanding process reliability.
- Extreme wear resistance.
- Increased productivity.



The right tool
 for every application

The entire range can be found from
 page 547 of this catalogue.

Solid carbide	DIN 6527	Type W	h6						HPC
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Garant GARANT Master Alu solid carbide milling cutter, HPC

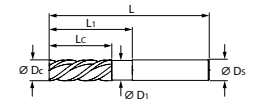
Extra sharp cutting edges.

Dimensions similar to DIN 6527.

Double relief ground side clearance angle.

For roughing and finishing. Up to 2xD into solid material at very high feed rates and smooth cutting action.

Note: Successor product to No. 202480.



Ground recess



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
			cast > 10% Si	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 2470	250	200	180	180	130	150	130	110								180	120	150					

Ø D _c	11X	20 2470	L _c	L ₁	Ø D ₁	L	Ø D ₃		
mm		GARANT Master Alu solid carbide milling cutter HPC	mm	mm	mm	mm	mm	f _z mm	f _z mm
3		eShop	10	15	2.8	57	6	0.04	0.05
4		eShop	13	18	3.7	57	6	0.05	0.06
5		eShop	15	20	4.7	57	6	0.06	0.08
6		eShop	16	21	5.5	57	6	0.06	0.08
8		eShop	22	27	7.4	63	8	0.08	0.1
10		eShop	25	30	9.2	72	10	0.09	0.12
12		eShop	28	33	11	83	12	0.1	0.15
14		eShop	30	35	13	83	14	0.12	0.17
16		eShop	36	41	15	92	16	0.14	0.18
20		eShop	41	51	19	104	20	0.18	0.22

Solid carbide	DIN 6527	Type W				
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GARANT Master Alu solid carbide milling cutter HPC / solid carbide milling cutter

Extra sharp cutting edges.

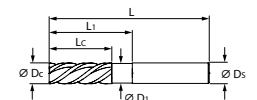
Dimensions similar to DIN 6527.

20 2512 – For roughing and finishing. Up to 2xD into solid material at very high feed rates and smooth cutting action.

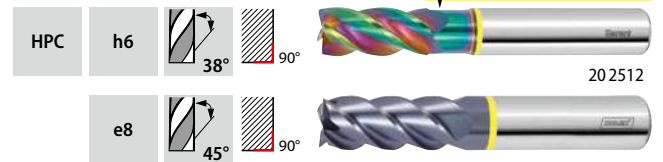
With the latest generation of **DLC coating sp²**.

20 2545 – Eccentric relief ground.

Note: 20 2512 – Successor product to No. 202515.

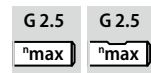


Ground recess



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
			cast > 10% Si	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 2512	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200					
20 2545	300	280	200	180	130	150	130	110								180	120	150					

Ø D _c	11X	20 2512	12X	20 2545	L _c	L ₁	Ø D ₁	L	Ø D ₃		
mm		GARANT Master Alu solid carbide milling cutter HPC DLC		Solid carbide milling cutter TiAlN	mm	mm	mm	mm	mm	f _z mm	f _z mm
2		eShop		—	6	13	1.8	57	6	0.03	—
3		eShop		eShop	10	15	2.8	57	6	0.04	0.008
4		eShop		eShop	13	18	3.7	57	6	0.05	0.015
4M		eShop		—	16	22	3.7	57	6	0.05	—
5		eShop		eShop	15	20	4.7	57	6	0.06	0.015
6		eShop		eShop	16	21	5.5	57	6	0.06	0.025
6M		eShop		—	20	24	5.5	65	6	0.06	—
8		eShop		eShop	22	27	7.4	63	8	0.08	0.03
8M		eShop		—	26	30	7.4	70	8	0.08	—
10		eShop		eShop	25	30	9.2	72	10	0.09	0.04
10M		eShop		—	30	38	9.2	80	10	0.09	—
12		eShop		eShop	28	33	11	83	12	0.1	0.05
12M		eShop		—	36	46	11	93	12	0.1	—
16		eShop		eShop	36	41	15	92	16	0.14	0.065
16M		eShop		—	48	58	15	110	16	0.14	—
20		eShop		eShop	41	51	19	104	20	0.18	0.085
20M		eShop		—	60	74	19	126	20	0.18	—



Garant Solid carbide roughing end mill HPC

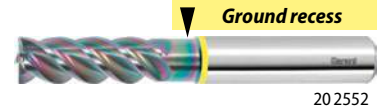
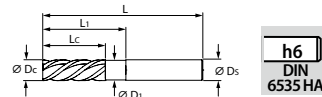
Sturdy roughing end mill **without** knuckle profile.

With strong core, **special chip breaker recesses** and **large polished flutes**.

Application: For roughing milling with high demands on the component surface.



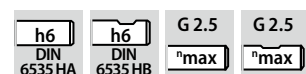
20 2549



20 2552

Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	Hybrid	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25		comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 2549	500	480	240																				
20 2552	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	240	200				

Ø f8 D _c	20 2549	20 2552	L _c	L ₁	Ø D ₁	L	Ø D _s	Shank form	Corner chamfer width at 45°			
	Solid carbide end mill											
	HPC											
mm	ZOX	DLC	mm	mm	mm	mm	mm	20 2549	20 2552	mm	mm	mm
4	eShop	eShop	16	22	3.7	62	6	HA	HA	0.1	0.05	0.06
5	eShop	eShop	17	24	4.7	62	6	HA	HA	0.1	0.06	0.08
6	eShop	eShop	18	24	5.5	62	6	HA	HA	0.2	0.07	0.09
8	eShop	eShop	24	30	7.4	68	8	HA	HA	0.2	0.08	0.1
10	eShop	eShop	30	38	9.2	80	10	HA	HA	0.2	0.09	0.11
12	eShop	eShop	36	46	11	93	12	HA	HA	0.2	0.1	0.12
16	eShop	eShop	48	58	15	108	16	HB	HA	0.2	0.12	0.14
20	eShop	eShop	60	74	19	126	20	HB	HA	0.2	0.16	0.18

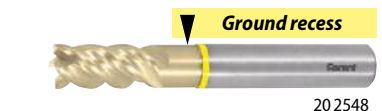


Garant Solid carbide roughing end mill HPC

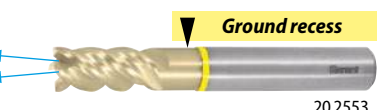
Sturdy roughing end mills **without** knuckle profile.

With strong core, **special chip breaker recesses** and **large polished flutes**.

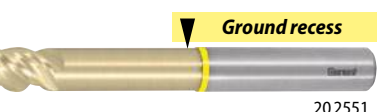
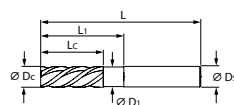
Application: For roughing milling with high demands on the component surface.



20 2548



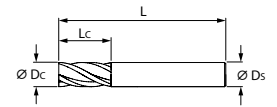
20 2553



20 2551

Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Honey-	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30		comb						
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 2548/2553	500	480	240																				
20 2551	250	240	120																				

Ø f8 D _c	20 2548	20 2553	20 2551	L _c	L ₁	Ø D ₁	L	Ø D _s	Shank form	Corner chamfer width at 45°		
	Solid carbide end mill	Solid carbide end mill with internal coolant supply	Solid carbide end mill									
	HPC											
mm	ZOX	ZOX	ZOX	mm	mm	mm	mm	mm	mm	mm	mm	mm
3	eShop	eShop	—	6	10	—	2.7	57	—	6	HA	0.1
4	eShop	eShop	—	8	14	—	3.7	57	—	6	HA	0.1
5	eShop	eShop	—	10	16	—	4.7	57	—	6	HA	0.1
6	eShop	eShop	eShop	12	19	42	5.5	57	80	6	HA	0.2
8	eShop	eShop	eShop	16	25	62	7.4	63	100	8	HA	0.2
10	eShop	eShop	eShop	20	30	58	9.2	72	100	10	HA	0.2
12	eShop	eShop	eShop	24	36	73	11	83	120	12	HA	0.2
16	eShop	eShop	eShop	32	42	100	15	92	150	16	HB	0.2
20	eShop	eShop	eShop	40	52	98	19	104	150	20	HB	0.2



Solid carbide milling cutter

20 2556 – Double relief ground side clearance angle.
20 2615 – Eccentric relief ground.

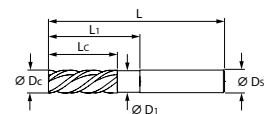
Note:

202556 – **Successor product to No. 202555.**
202615 – **Successor product to No. 202610.**



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si										INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K						
20 2556		280	200	120	105	100	70	60	35				80	60		90	●		●	○	○	●
20 2615		280	200	120	105	100	70						80	60		90			●	○	○	●

Ø e8 D _c	1X 20 2556		12X 20 2615		L _c	L		Ø D _s	Shank form	Corner chamfer width at 45°	 < 900 N f _z	 < 900 N f _z		
	Garant		HOLEX											
	Solid carbide milling cutter													
mm	TiAlN	TiAlN	mm	20 2556 mm	20 2615 mm	mm		20 2556 mm	mm	mm				
2	eShop	eShop	3	32	32	2	HA	0.03	0.01	0.011				
3	eShop	eShop	5	32	32	3	HA	0.04	0.01	0.011				
4	eShop	eShop	8	36	36	4	HA	0.05	0.02	0.023				
5	eShop	eShop	9	45	45	5	HA	0.06	0.02	0.023				
6	eShop	eShop	10	45	46	6	HB	0.07	0.03	0.033				
8	eShop	eShop	12	55	55	8	HB	0.08	0.04	0.045				
10	eShop	eShop	14	67	65	10	HB	0.1	0.05	0.06				
12	eShop	eShop	16	66	66	12	HB	0.13	0.06	0.08				



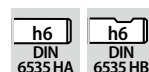
Solid carbide milling cutter

20 2640 – Double relief ground side clearance angle.
20 2680 – Eccentric relief ground.



Suitable for/ V _c [m/min]	Alu plastics 	Alu cast Si 	Alu cast Si 										INOX	INOX	Ti	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K							
20 2640		140	105	70	60	55	35	30	25				40	30		55	●	●	●	○	○	○	○
20 2680		140	105	70	60	55	35						40			55	○	●	●	○	○	○	○

Ø e8 D _c	11X		12X		L _c	L ₁	Ø D ₁	L	Ø D ₃	Shank form	Corner chamfer width at 45°	 < 900 N f _z	 < 900 N f _z
	20 2640 Garant		20 2680 HOLEX										
Solid carbide milling cutter													
mm					mm	20 2640 mm	20 2640 mm	mm	mm		20 2640 mm	mm	mm
2	eShop		eShop		8	13	1.8	32	2	HA	0.03	0.01	0.011
3	eShop		eShop		12	17	2.8	38	3	HA	0.04	0.01	0.011
4	eShop		eShop		13	18	3.8	40	4	HA	0.05	0.02	0.023
5	eShop		eShop		15	20	4.8	50	5	HA	0.06	0.02	0.023
6	eShop		eShop		16	21	5.8	58	6	HB	0.07	0.03	0.033
7	eShop		—		20	25	6.8	60	7	HA	0.07	0.03	0.033
8	eShop		eShop		22	32	7.8	70	8	HB	0.08	0.04	0.045
9	eShop		—		20	30	8.8	60	9	HA	0.08	0.04	0.045
10	eShop		eShop		25	30	9.8	73	10	HB	0.1	0.05	0.06
12	eShop		eShop		28	38	11.8	84	12	HB	0.13	0.06	0.08
13	eShop		—		25	35	12.8	75	13	HA	0.14	0.06	0.08
14	eShop		—		30	35	13.8	84	14	HB	0.15	0.06	0.08
15	eShop		—		25	35	14.8	75	15	HA	0.15	0.06	0.08
16	eShop		eShop		35	45	15.8	93	16	HB	0.18	0.08	0.1
18	eShop		—		35	45	17.8	100	18	HB	0.18	0.08	0.1
20	eShop		—		40	50	19.8	104	20	HB	0.2	0.1	0.12
25	eShop		—		50	60	24.5	125	25	HB	0.25	0.1	0.12



Solid carbide milling cutter

20 2760 – Eccentric relief ground.

20 2720/2725 – Double relief ground side clearance angle.

20 2725/2760 – **Without** 45° cutting edge chamfer.



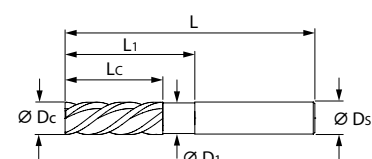
20 2720



20 2725



20 2760



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 2720/2725		280				100	70	60	35					80	60		90	●		●	○	●	○
20 2760		280				100	70	60	35					80	60		90	○		●	○	○	○

Ø e8 D _c	11X	20 2720	11X	20 2725	L _c	L ₁	Ø D ₁	L	Ø D _s	Shank form	Corner chamfer width at 45°			
	Solid carbide milling cutter													
	TiAlN		TiAlN		mm	mm	mm	mm	mm		20 2720 mm	mm	mm	
2	eShop		eShop 		8	13	1.8	32	2	HA	0.03	0.01	0.011	
3	eShop		eShop 		12	17	2.8	38	3	HA	0.04	0.01	0.011	
4	eShop		eShop		12	18	3.8	40	4	HA	0.04	0.02	0.023	
5	eShop		eShop 		15	20	4.8	50	5	HA	0.06	0.02	0.023	
6	eShop		eShop		16	21	5.8	58	6	HB	0.07	0.03	0.033	
7	eShop		eShop 		20	25	6.8	60	7	HA	0.07	0.03	0.033	
8	eShop		eShop		22	32	7.8	70	8	HB	0.08	0.04	0.045	
9	eShop		eShop 		20	30	8.8	60	9	HA	0.08	0.04	0.045	
10	eShop		eShop		25	30	9.8	73	10	HB	0.1	0.05	0.06	
12	eShop		eShop 		28	38	11.8	84	12	HB	0.13	0.06	0.08	
13	eShop		eShop		25	35	12.8	75	13	HA	0.14	0.06	0.08	
14	eShop		eShop		30	35	13.8	84	14	HB	0.15	0.06	0.08	
15	eShop		eShop		25	35	14.8	75	15	HA	0.15	0.06	0.08	
16	eShop		eShop		35	45	15.8	93	16	HB	0.18	0.08	0.1	
18	eShop		eShop		36	45	17.8	100	18	HB	0.18	0.08	0.1	
20	eShop		eShop		41	50	19.8	104	20	HB	0.2	0.1	0.12	
25	eShop		eShop		50	60	24.5	125	25	HB	0.25	0.1	0.12	

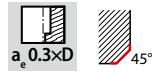
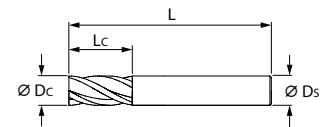
Ø h10 D _c	12X	20 2760 HOLEX	L _c	L	Ø D _s	Shank form	f _z	f _z
mm		TiAlN	mm	mm	mm		mm	mm
2		eShop	8	32	2	HA	0.01	0.011
3		eShop	12	38	3	HA	0.01	0.011
4		eShop	12	40	4	HA	0.02	0.023
5		eShop	15	50	5	HA	0.02	0.023
6		eShop	16	58	6	HB	0.03	0.033
8		eShop	22	70	8	HB	0.04	0.045
10		eShop	25	73	10	HB	0.05	0.06
12		eShop	28	84	12	HB	0.06	0.08
16		eShop	35	93	16	HB	0.08	0.1
20		eShop	41	104	20	HB	0.1	0.12

Solid
carbideType
N

e8

h6
DIN
6535 HAh6
DIN
6535 HB
Garant Solid carbide milling cutter

Double relief ground side clearance angle.

20 2815/2825 – With **high-performance coating** for general-purpose use.

20 2810



20 2815



20 2820



20 2825

Suitable for/ v _c [m/min]	Alu plastics 	Alu  cast	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 2810		140	105	70	60	55	35	30	25					40	80		55	○		●	○		
20 2815		280	200	120	105	100	70	60	35					80	60		90	●		●	○	○	○
20 2820		110	80	50	45	40	35	25						35			55	○		●	○	○	
20 2825		210	140	80	75	70	50	40	25					60	40		70	●		●	○	○	○

Ø e8 D _c	11X	20 2810	11X	20 2815	L _c	L	Ø D _s	Shank form	Corner chamfer width at 45°		
		Solid carbide milling cutter									
mm				TiAlN	mm	mm	mm		mm	f _z	f _z
										20 2810	
4		eShop		eShop	16	75	4	HA	0.04	0.02	0.023
5		eShop		eShop	20	75	5	HA	0.05	0.02	0.023
6		eShop		eShop	24	80	6	HB	0.06	0.03	0.033
8		eShop		eShop	32	100	8	HB	0.07	0.04	0.045
10		eShop		eShop	40	100	10	HB	0.08	0.05	0.06
12		eShop		eShop	48	120	12	HB	0.1	0.06	0.08
14		eShop		eShop	45	100	14	HB	0.13	0.06	0.08
16		eShop		eShop	50	125	16	HB	0.15	0.08	0.1
18		eShop		eShop	55	130	18	HB	0.18	0.08	0.1
20		eShop		eShop	60	135	20	HB	0.2	0.1	0.12

Ø e8 D _c	11X	20 2820	11X	20 2825	L _c	L	Ø D _s	Shank form	Corner chamfer width at 45°		
		Solid carbide milling cutter									
mm				TiAlN	mm	mm	mm		mm	f _z	f _z
										20 2820	
3		eShop		eShop	16	75	3	HA	0.04	0.01	0.011
4		eShop		eShop	20	100	4	HA	0.05	0.02	0.023
5		eShop		eShop	25	100	5	HA	0.06	0.02	0.023
6		eShop		eShop	30	100	6	HB	0.07	0.03	0.033
8		eShop		eShop	40	120	8	HB	0.08	0.04	0.045
10		eShop		eShop	50	120	10	HB	0.1	0.05	0.06
12		eShop		eShop	60	150	12	HB	0.13	0.06	0.08
14		eShop		eShop	56	150	14	HB	0.15	0.06	0.08
16		eShop		eShop	65	150	16	HB	0.18	0.08	0.1
18		eShop		eShop	72	150	18	HB	0.18	0.08	0.1
20		eShop		eShop	80	150	20	HB	0.2	0.1	0.12

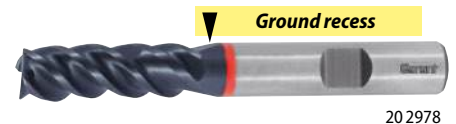
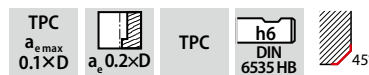
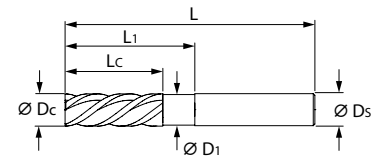


Garant Solid carbide milling cutter MTC / TPC, MTC

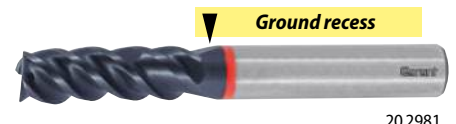
Significant cutting force reduction due to 45° helix.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

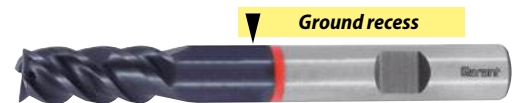
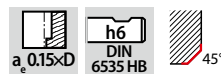
Note: For materials > 55 HRC we recommend reducing the depth of cut to $a_p = 0.25 \times D \dots 0.5 \times D$.



20 2978



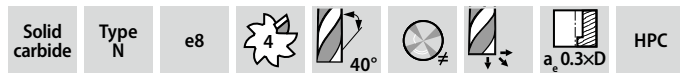
20 2981



20 2982

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	N						
20 2978/2981						160	115	115	60	30	25	20										
20 2982						90	70	60	45	25	20	15										

$\varnothing f_8$ D_c	20 2978	20 2981	20 2982	L_c		L_1		$\varnothing D_1$	L		$\varnothing D_s$	Corner chamfer width at 45°	Corner rounding r_v	f_z	f_z
	Solid carbide roughing end mill			20 2978 20 2981	20 2982	20 2978 20 2981	20 2982		20 2978 20 2981	20 2982		20 2978 20 2982	20 2981		
mm	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4	eShop	eShop	—	16	—	23	—	3.8	62	—	6	0.05	0.1	0.008	0.01
5	eShop	eShop	—	17	—	24	—	4.7	62	—	6	0.1	0.1	0.01	0.015
6	eShop	eShop	eShop	18	12	25	42	5.5	62	80	6	0.1	0.1	0.015	0.02
8	eShop	eShop	eShop	24	16	30	62	7.4	68	100	8	0.1	0.2	0.02	0.025
10	eShop	eShop	eShop	30	20	35	60	9.2	80	100	10	0.15	0.2	0.025	0.03
12	eShop	eShop	eShop	36	24	45	73	11	93	120	12	0.15	0.3	0.03	0.035
14	eShop	—	—	42	—	50	—	13	99	—	14	0.15	—	0.05	0.04
16	eShop	eShop	eShop	48	32	55	100	15	108	150	16	0.15	0.3	0.04	0.045
20	eShop	eShop	eShop	60	40	70	98	19	126	150	20	0.25	0.3	0.05	0.05



Garant INOX solid carbide milling cutter HPC, INOX solid carbide milling cutter with chip separators HPC/TPC

Milling cutter with **optimised geometry** and modern **high-performance coating** for optimum metal removal rate in various **stainless steels**.

Can also be used in **duplex materials**.

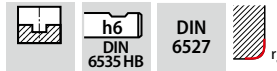
Dimensions similar to DIN 6527.

Note:

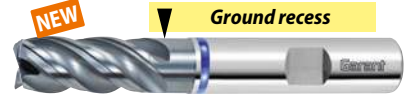
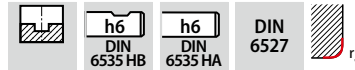
20 2950 – **Successor product to 202986.**

20 2952 – **Successor product to 202989.**

20 2954/2956 – **With chip separators for controlled chip breaking.** For reliable working in automated production environments thanks to reliable chip evacuation from the component. Cutting data for TPC machining in the ToolScout.



20 2950



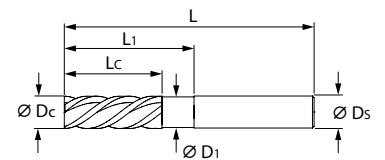
20 2952



20 2954



20 2956



Suitable for/ v _c [m/min]	Alu plastics 	Alu  cast	Alu cast > 10% Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M	S					
20 2950–20 2954				240	220	200	180	150						115	80	100	90			●	●	○	●
20 2956				210	190	170	150	120						110	75	95	85				●	○	●

Ø e8 D _c	11Z	20 2950	11Z	20 2952	L _c		L ₁		Ø D ₁		L		Ø D _s	Shank form	Corner rounding r _v		
	GARANT INOX solid carbide milling cutter																
	HPC				20 2950	20 2952	20 2950	20 2952	20 2950		20 2952					f _z	f _z
	mm	AITiN		AITiN	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm
0,5	—		eShop	—	1.3	—	1.5	0.48	—	50	4	HA		0.02	0.007	0.01	
0,8	—		eShop	—	2.1	—	3	0.76	—	50	4	HA		0.03	0.008	0.012	
1	—		eShop	—	2.5	—	4	0.9	—	50	4	HA		0.05	0.012	0.018	
1,5	—		eShop	—	3.5	—	6	1.4	—	50	4	HA		0.1	0.015	0.022	
2	—		eShop	—	5	—	8	1.8	—	57	6	HA		0.1	0.017	0.024	
2,5	—		eShop	—	6	—	10	2.3	—	57	6	HA		0.1	0.019	0.028	
3	eShop		eShop	5	8	—	13	2.8	50	57	6	HA		0.1	0.02	0.03	
4	eShop		eShop	8	11	—	17	3.8	54	57	6	HA		0.1	0.025	0.035	
5	eShop		eShop	9	13	—	19	4.8	54	57	6	HB		0.1	0.03	0.04	
6	eShop		eShop	10	13	16	19	5.8	54	57	6	HB		0.1	0.035	0.045	
8	eShop		eShop	12	21	20	25	7.7	58	63	8	HB		0.15	0.05	0.05	
10	eShop		eShop	14	22	24	30	9.7	66	72	10	HB		0.2	0.055	0.06	
12	eShop		eShop	16	26	26	36	11.6	73	83	12	HB		0.2	0.06	0.07	
16	eShop		eShop	22	36	32	42	15.5	82	92	16	HB		0.2	0.07	0.08	
20	eShop		eShop	26	41	40	52	19.5	92	104	20	HB		0.2	0.09	0.1	

Ø e8 D _c	11Z 20 2954		11Z 20 2956		L _c		L ₁		Ø D ₁		L		Ø D _s		Number of chip separators		Shank form	Corner rounding r _v	 INOX > 900 N f _z
	GARANT INOX solid carbide milling cutter with chip separators																		
	HPC / TPC				20 2954	20 2956	20 2954	20 2956			20 2954	20 2956			20 2954	20 2956			
	mm	AITiN	AITiN		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			
4	eShop	—		11	—	17	—	3.8	57	—	6	1	—		HB	0.1	0.012		
5	eShop	—		13	—	19	—	4.8	57	—	6	1	—		HB	0.1	0.022		
6	eShop	eShop		13	20	19	25	5.8	57	65	6	1	2		HB	0.1	0.032		
8	eShop	eShop		21	26	25	30	7.7	63	70	8	1	2		HB	0.15	0.042		
10	eShop	eShop		22	32	30	36	9.7	72	80	10	1	2		HB	0.2	0.052		
12	eShop	eShop		26	39	36	46	11.6	83	93	12	1	2		HB	0.2	0.062		
16	eShop	eShop		36	52	42	57	15.5	92	110	16	1	2		HB	0.2	0.077		
20	eShop	eShop		41	64	52	72	19.5	104	125	20	1	2		HB	0.2	0.097		



Garant GARANT Master INOX solid carbide milling cutter HPC, HPC/TPC

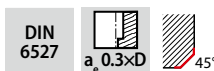
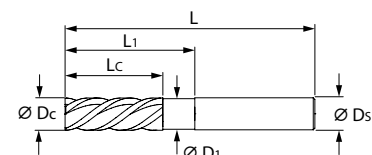
For **roughing and finishing.**

HPC milling cutter with newly developed high-performance coating for outstanding tool life and optimum metal removal rate in a very wide range of stainless steels. **Greater oxidation resistance and high-temperature hardness.**

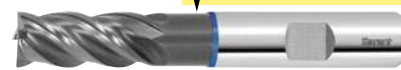
Can be used at **high cutting speeds**, particularly suitable even for TOOLOX®.

20 2999 – With **internal coolant supply** for reliable chip evacuation.

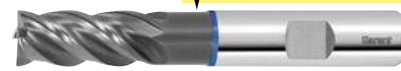
Advantage: Particularly low vibration running.



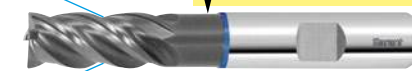
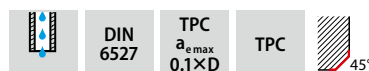
20 2998



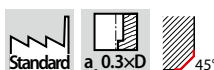
20 2997



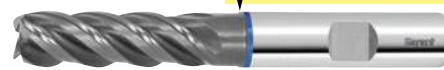
20 3007



20 2999



20 3006



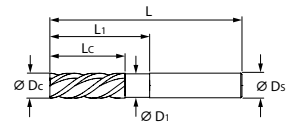
20 3011

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 50 HRC	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
20 2997/2998/3007				250	230	200	180	115	80						110	90				●	●	○	●
20 2999				250	230	200	180	115	80						110	90				●	●	○	●
20 3006/3011				240	220	180	180	115	80						100	85				●	●	○	●

Ø h10 D _c	GARANT Master INOX solid carbide milling cutter				L _c		L ₁	Ø D ₁	L		Ø D ₃	Corner chamfer width at 45°			
	11X 20 2998	11X 20 2997	11X 20 3007	11X 20 2999											
	HPC	HPC / TPC	HPC / TPC	HPC / TPC	20 2998	20 2997 20 3007 20 2999	20 2997 20 3007 20 2999	20 2997 20 3007 20 2999	20 2998	20 2997 20 3007 20 2999		20 2998 20 3007 20 2999	20 2997	f _z	f _z
mm	TiAlN	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2	—	—	eShop	—	—	5	13	1.8	—	40	4	0.15	—	0.01	0.012
3	eShop	eShop	eShop	—	5	8	20	2.8	50	57	6	0.15	0.1	0.012	0.015
4	eShop	eShop	eShop	eShop	8	11	21	3.8	54	57	6	0.15	0.1	0.012	0.015
5	eShop	eShop	eShop	eShop	9	13	22	4.7	54	57	6	0.25	0.1	0.025	0.025
6	eShop	eShop	eShop	eShop	10	13	23	5.6	54	57	6	0.25	0.1	0.025	0.03
8	eShop	eShop	eShop	eShop	12	19	29	7.5	57	63	8	0.25	0.1	0.025	0.04
10	eShop	eShop	eShop	eShop	14	22	34	9.5	66	72	10	0.25	0.1	0.04	0.045
12	eShop	eShop	eShop	eShop	16	26	40	11.5	73	83	12	0.25	0.1	0.04	0.05
14	—	—	eShop	—	—	26	40	13.5	—	83	14	0.25	—	0.05	0.055
16	eShop	eShop	eShop	eShop	22	32	46	15.5	82	92	16	0.35	0.1	0.05	0.055
18	—	—	eShop	—	—	32	46	17.5	—	92	18	0.35	—	0.07	0.08
20	eShop	eShop	eShop	eShop	26	38	56	19.5	92	104	20	0.35	0.1	0.07	0.08
25	—	—	eShop	—	—	45	66	24.5	—	121	25	0.35	—	0.07	0.08

Ø h10 D _c	1X 20 3006		1X 20 3011		L _c	L ₁	Ø D ₁	L	Ø D ₃	Corner chamfer width at 45°		
	GARANT Master INOX solid carbide milling cutter											
	mm	HPC TiAlN	HPC/TPC TiAlN	20 3006 mm							20 3011 mm	mm
5	eShop	eShop	13	18	25	4.8	62	6	0.25	0.025	0.025	
6	eShop	eShop	13	18	25	5.5	62	6	0.25	0.025	0.03	
8	eShop	eShop	19	24	32	7.5	68	8	0.25	0.025	0.04	
10	eShop	eShop	22	30	40	9.5	80	10	0.25	0.04	0.045	
12	eShop	eShop	26	36	48	11.5	93	12	0.25	0.04	0.05	
16	eShop	eShop	32	48	56	15.5	108	16	0.35	0.05	0.055	
20	eShop	eShop	38	60	70	19.5	126	20	0.35	0.07	0.08	

Solid carbide	DIN 6527	Type N	f8	4	35°	≠	≠	≠	h6 DIN 6535 HB	HPC
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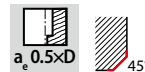


HOLEX Pro INOX solid carbide milling cutter HPC

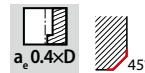
HPC milling cutters with **newly developed high-performance coating** for **outstanding tool working life** and **optimum metal removal rates** in a wide range of stainless steels.

For use at **high cutting speeds**, particularly suitable even for steels up to approx. 1100 N/mm².

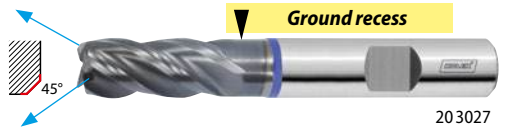
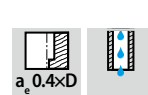
20 3027 – With **internal coolant supply** for reliable swarf evacuation.



20 3013



20 3015



20 3027

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M						
20 3013/3015				240	220	180	180	150						115	80	100	85	○	●	●	○	●	●
20 3027				240	220	180	180	150						115	80	100	85	○	●	●	○	●	●

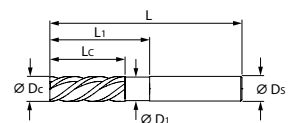
Ø f8 D _c	12X	20 3013	12X	20 3015	12X	20 3027	L _c		L ₁	Ø D ₁	L		Ø D _s	Corner chamfer width at 45°		
	HOLEX Pro Inox solid carbide milling cutter						HOLEX Pro Inox solid carbide milling cutter with through-coolant								INOX > 900 N f _z	INOX > 900 N f _z
	HPC						20 3013	20 3015 20 3027	20 3015 20 3027	20 3015 20 3027	20 3013	20 3015 20 3027				
mm	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	AlCrN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3	eShop	eShop	—	—	—	—	5	8	13	2.8	50	57	6	0.1	0.012	0.015
4	eShop	eShop	eShop	eShop	eShop	eShop	8	11	17	3.8	54	57	6	0.1	0.012	0.015
5	eShop	eShop	eShop	eShop	eShop	eShop	9	13	19	4.8	54	57	6	0.1	0.025	0.025
6	eShop	eShop	eShop	eShop	eShop	eShop	10	13	19	5.8	54	57	6	0.1	0.025	0.03
8	eShop	eShop	eShop	eShop	eShop	eShop	12	21	25	7.7	58	63	8	0.2	0.025	0.04
10	eShop	eShop	eShop	eShop	eShop	eShop	14	22	30	9.7	66	72	10	0.2	0.04	0.045
12	eShop	eShop	eShop	eShop	eShop	eShop	16	26	36	11.6	73	83	12	0.3	0.04	0.05
14	—	eShop	—	—	—	—	—	26	36	13.6	—	83	14	0.3	0.05	0.055
16	eShop	eShop	eShop	eShop	eShop	eShop	22	36	42	15.5	82	92	16	0.3	0.05	0.055
18	—	eShop	—	—	—	—	—	36	42	17.5	—	104	18	0.3	0.07	0.08
20	eShop	eShop	eShop	eShop	eShop	eShop	26	41	52	19.5	92	104	20	0.3	0.07	0.08

Solid carbide	Standard	Type N	f8	4	35°	≠	≠	≠	a _e 0.3xD	h6 DIN 6535 HB	HPC
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HOLEX Pro INOX solid carbide milling cutter HPC

HPC milling cutters with **newly developed high-performance coating** for **outstanding tool working life** and **optimum metal removal rates** in a wide range of stainless steels.

For use at **high cutting speeds**, particularly suitable even for steels up to approx. 1100 N/mm².



20 3021

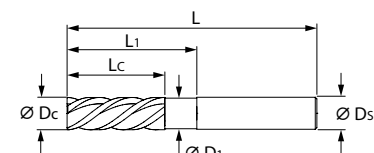
Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M						
20 3021				240	220	180	180	150						115	80	100	85	○	●	●	○	○	○

Ø f8 D _c	12X	20 3021	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	INOX > 900 N f _z	INOX > 900 N f _z
		HOLEX Pro Inox solid carbide milling cutter								
		HPC								
mm		AlCrN	mm	mm	mm	mm	mm	mm	mm	mm
6		eShop	18	24	5.8	62	6	0.1	0.025	0.03
8		eShop	24	30	7.7	68	8	0.2	0.025	0.04
10		eShop	30	38	9.7	80	10	0.2	0.04	0.045
12		eShop	36	46	11.6	93	12	0.3	0.04	0.05
16		eShop	48	58	15.5	108	16	0.3	0.05	0.055
20		eShop	60	74	19.5	126	20	0.3	0.07	0.08

Solid carbide	Type N	e8							HPC
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HOLEX Pro INOX M solid carbide milling cutter HPC

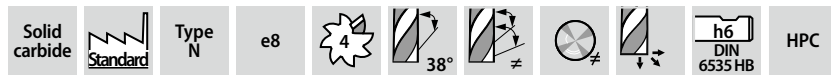
Outstanding tool life in its class for machining **corrosion-resistant steels** thanks to **innovative coating and geometry**. Especially for **stainless steels in the high-performance range**, e.g. duplex. **Optimal metal removal rate** due to **high cutting speeds**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX < 900 N	INOX > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	O					
20 2991–20 2996				240	220	180	180	150						115	80	100	85					

Ø e8 D _c	12°	20 2991	12°	20 2994	L _c		L ₁	Ø D ₁	L		Ø D _s	Corner chamfer width at 45°			
	HOLEX Pro Inox M solid carbide milling cutter														
	HPC				20 2991	20 2994	20 2994	20 2994	20 2991	20 2994					
mm	TiSiN		TiSiN		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
3	eShop		eShop		5	8	13	2.8	50	57	6	0.1	0.012	0.015	
4	eShop		eShop		8	11	17	3.8	54	57	6	0.1	0.012	0.015	
5	eShop		eShop		9	13	19	4.8	54	57	6	0.1	0.025	0.03	
6	eShop		eShop		10	13	19	5.8	54	57	6	0.1	0.025	0.03	
8	eShop		eShop		12	21	25	7.7	58	63	8	0.2	0.03	0.05	
10	eShop		eShop		14	22	30	9.7	66	72	10	0.2	0.04	0.055	
12	eShop		eShop		16	26	36	11.6	73	83	12	0.3	0.045	0.06	
16	eShop		eShop		22	36	42	15.5	82	92	16	0.3	0.06	0.08	
20	eShop		eShop		26	41	52	19.5	92	104	20	0.3	0.075	0.09	

Ø e8 D _c	12°	20 2996	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°		
		HOLEX Pro Inox M solid carbide milling cutter								
		HPC								
mm		TiSiN								
6		eShop	18	24	5.8	65	6	0.1	0.02	0.025
8		eShop	24	30	7.7	70	8	0.2	0.03	0.05
10		eShop	30	38	9.7	80	10	0.2	0.035	0.05
12		eShop	36	46	11.6	93	12	0.3	0.04	0.06
16		eShop	48	58	15.5	110	16	0.3	0.05	0.065
20		eShop	60	74	19.5	126	20	0.3	0.07	0.09

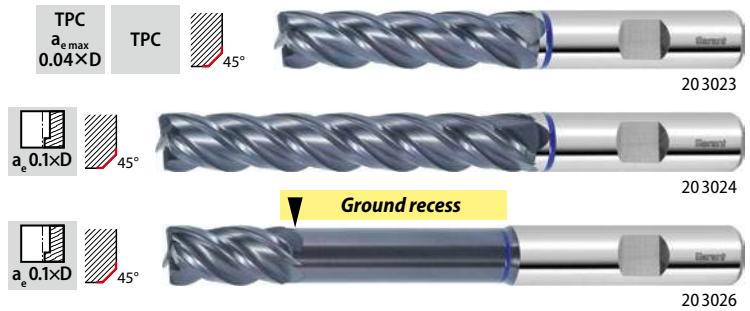


Garant Solid carbide milling cutter HPC / TPC

20 3023 – Shank similar to DIN 6535 HB.

Note:

- 20 3023 – Successor product to No. 203018.
 20 3024 – Successor product to No. 203022.
 20 3026 – Successor product to No. 203025.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S						
20 3023				210	195	170	150	145					95	70	85	75	50	○		●	●	○	
20 3024				100	90	80	70	65					55	50	45	40	30	○		●	●	○	
20 3026				120	110	100	90	80					70	60	55	45	35	○		●	●	○	

$\varnothing e8$ D_c	1X 20 3023	1X 20 3024	1X 20 3026	L_c			L_1	$\varnothing D_1$	L	$\varnothing D_3$	Corner chamfer width at 45°	f_z
	Solid carbide milling cutter			20 3023	20 3024	20 3026	20 3026	20 3026	20 3023	20 3024 20 3026		
	HPC / TPC	HPC	HPC									
	TiAlN	TiAlN	TiAlN									
mm				mm	mm	mm	mm	mm	mm	mm	mm	mm
6	eShop	—	eShop	32	—	12	42	5.5	83	100	6	0.4
8	eShop	—	eShop	32	—	16	62	7.4	90	100	8	0.4
10	eShop	eShop	eShop	38	50	20	60	9.2	100	100	10	0.5
12	eShop	eShop	eShop	51	76	24	73	11	100	125	12	0.5
16	eShop	eShop	eShop	57	76	32	100	15	125	150	16	0.5
20	eShop	eShop	eShop	57	102	40	98	19	126	175	20	0.5



Garant GARANT Master Titan solid carbide milling cutter HPC / GARANT Master Ni-Based solid carbide milling cutter HPC/TPC

Specially ground with **corner radii similar to torus cutters**.

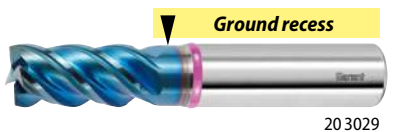
- 20 3048 – Innovative substrate specially for machining **nickel-based alloys**.
 Newly developed coating.

Application:

- 20 3029 – For milling **titanium and titanium alloys**, with very smooth cutting action for optimum tool life and top metal removal rate.
 20 3048 – For milling **nickel-based alloys with high red hardness**.

Note:

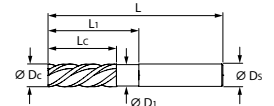
- 20 3048 – Successor product to No. 203028.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Inconel® GR1	Graphite CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	S	N					
20 3029																60				●			
20 3048																40				●			

$\varnothing D_c$	11Z 20 3029	11Z 20 3048	L_c		L_1	$\varnothing D_1$	L	$\varnothing D_3$	Corner rounding r_v	Inconel®	Ti	Ti
	GARANT Master Titan solid carbide milling cutter		GARANT Master Ni-Based solid carbide milling cutter									
	HPC	HPC / TPC	20 3029	20 3048	20 3029	20 3048			20 3029	20 3048	20 3048	20 3029
	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3	eShop	eShop	8	8	13	13	2.8	57	6	0.1	0.2	0.03
4	eShop	eShop	11	11	16	17	3.8	57	6	0.1	0.2	0.035
5	eShop	eShop	13	13	18	19	4.8	57	6	0.1	0.2	0.04
6	eShop	eShop	13	13	19	19	5.8	57	6	0.1	0.2	0.05
8	eShop	eShop	21	21	25	25	7.7	63	8	0.2	0.2	0.065
10	eShop	eShop	22	22	32	30	9.7	72	10	0.2	0.2	0.07
12	eShop	eShop	26	26	36	36	11.6	83	12	0.2	0.2	0.075
16	eShop	eShop	36	36	42	42	15.5	92	16	0.2	0.3	0.08
20	eShop	—	41	—	54	—	19.5	104	20	0.2	—	0.06

Solid carbide	DIN 6527	Type N	f8	4	38°	≠	≠	h6 DIN 6535 HB	HPC
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Garant GARANT Master Steel solid carbide roughing end mill HPC

For **roughing and finishing**.

20 3034 – Up to 1xD into solid material **at very high feed rates** with smooth cutting action.
At maximum machining depths, ensure compliance with the ratio dimension L_c (cutting length) / Ø (nominal size)!

20 3039/3035 – Up to 1.5xD into solid material **at very high feed rates** with smooth cutting action.

Advantage: Optimised flute form, eccentric relief ground, wide chip space.



20 3034



Ground recess



20 3039



Ground recess

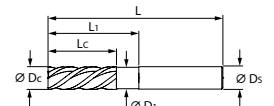


20 3035

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 3034–20 3039			260	240	190	180	150						80	70		250	●	●	○	●	●	●

Ø f8 D _c	11X	20 3034	11X	20 3039	11X	20 3035	L _c		L ₁	Ø D ₁	L		Ø D ₅	Corner chamfer width at 45°			
	GARANT Master Steel solid carbide roughing end mill																
	HPC						20 3034	20 3039 20 3035	20 3039 20 3035	20 3039 20 3035	20 3034	20 3039 20 3035		20 3034 20 3035	20 3039	f _z	f _z
mm	TiAlN	TiAlN	TiAlN				mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3	eShop	—	eShop				6	8	—	—	50	57	6	0.06	—	0.02	0.025
4	eShop	—	eShop				8	11	—	—	54	57	6	0.08	—	0.02	0.025
5	eShop	—	eShop				9	13	—	—	54	57	6	0.1	—	0.03	0.04
6	eShop	eShop	eShop				10	13	20	5.8	54	57	6	0.12	0.1	0.04	0.05
7	—	—	eShop				—	16	25	6.8	—	63	8	0.14	—	0.04	0.05
8	eShop	eShop	eShop				12	21	25	7.8	58	63	8	0.16	0.1	0.05	0.06
9	—	—	eShop				—	22	30	8.8	—	72	10	0.18	—	0.06	0.08
10	eShop	eShop	eShop				14	22	30	9.8	66	72	10	0.2	0.1	0.06	0.08
12	eShop	eShop	eShop				16	26	36	11.8	73	83	12	0.24	0.1	0.07	0.09
14	eShop	eShop	eShop				16	26	36	13.8	73	83	14	0.28	0.1	0.08	0.1
16	eShop	eShop	eShop				22	36	42	15.8	82	92	16	0.32	0.1	0.08	0.1
18	eShop	—	eShop				22	36	42	17.8	82	92	18	0.36	—	0.1	0.13
20	eShop	eShop	eShop				26	41	54	19.8	92	104	20	0.4	0.1	0.1	0.13
25	—	eShop	eShop				—	68	80	24.5	—	136	25	0.5	0.1	0.12	0.16

Solid carbide	Standard	Type N	f8	4	38°	≠	≠	h6 DIN 6535 HB	HPC
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Garant GARANT Master Steel solid carbide roughing end mill HPC

For **roughing and finishing** up to 0.7xD into solid material **at very high feed rates** with smooth cutting action.

Advantage: Optimised flute form, eccentric relief ground, wide chip space.



20 3036



20 3038

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 3036			260	240	190	180	150						80	70		250	●	●	○	●	●	●
20 3038			125	95	85	80	70						50	35		85	●	●	○	●	●	●

Ø f8 D _c	11X 20 3036		11X 20 3038		L _c	L ₁	Ø D ₁	L	Ø D ₅	Corner chamfer width at 45°	 < 900 N f _z	 < 900 N f _z		
	GARANT Master Steel solid carbide roughing end mill													
	HPC													
	TiAlN		TiAlN											
mm					mm	mm	mm	mm	mm	mm	mm	mm		
6	eShop		eShop		13	25	42	5.8	62	80	6	0.12	0.04	0.05
8	eShop		eShop		21	30	62	7.7	68	100	8	0.16	0.05	0.06
10	eShop		eShop		22	38	58	9.7	80	100	10	0.2	0.06	0.08
12	eShop		eShop		26	46	73	11.6	93	120	12	0.24	0.07	0.09
14	eShop		—		26	52	—	13.6	99	—	14	0.28	0.08	0.1
16	eShop		eShop		36	58	100	15.5	108	150	16	0.32	0.08	0.1
18	eShop		—		36	67	—	17.5	117	—	18	0.36	0.1	0.13
20	eShop		eShop		41	74	98	19.5	126	150	20	0.4	0.1	0.13



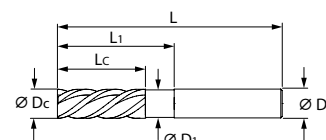
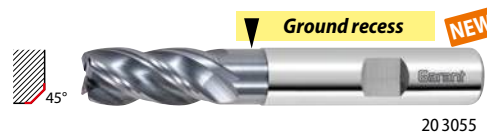
Garant GARANT GreenPlus solid carbide milling cutter HPC

For **roughing and finishing** with **very high cutting data**.

Optimised core geometry ensures a **low tendency to vibrate** and thus significantly **increased tensile strength**.

Innovative geometry and high-performance coating allow the machining of **different materials** while maintaining **high temperature resistance**.

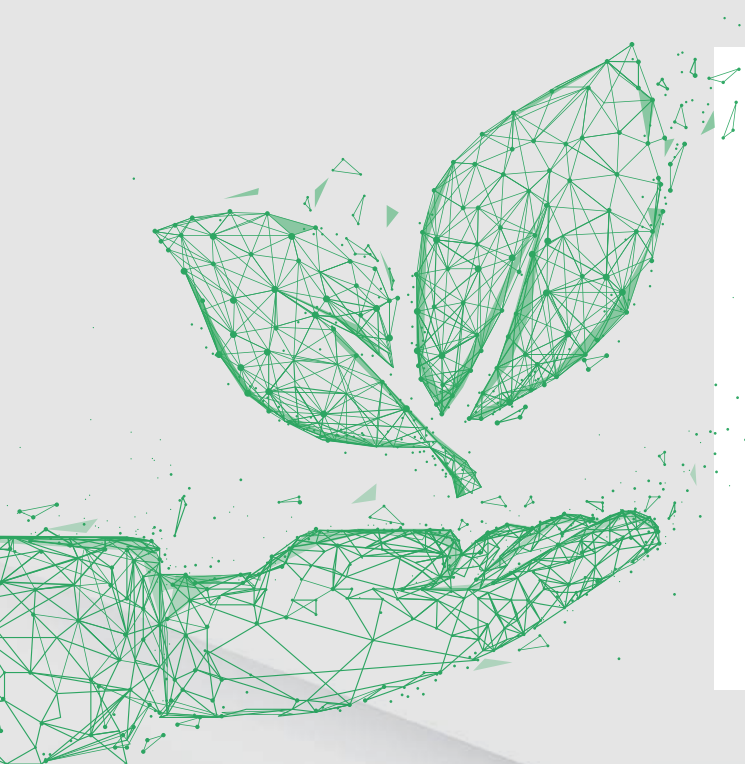
Advantage: In the milling cutter range of the Hoffmann Group, the production of the micrograin carbide substrate rod currently has the **lowest product-specific CO₂ emissions**, thus **reducing the environmental footprint** compared to conventionally produced carbide rods.



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 3055				250	230	190	180	150						100	90	40	220	●		●	○	●	●

Ø f8 D _c	11Z	20 3055	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°				
	GARANT GreenPlus solid carbide milling cutter											
		HPC							f _z	f _z	f _z	f _z
mm		TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3		eShop	8	13	2.8	57	6	0.1	0.015	0.01	0.02	0.012
4		eShop	11	17	3.8	57	6	0.1	0.02	0.012	0.025	0.015
5		eShop	13	19	4.8	57	6	0.1	0.025	0.015	0.035	0.02
6		eShop	13	19	5.8	57	6	0.1	0.035	0.02	0.045	0.025
8		eShop	21	25	7.7	63	8	0.2	0.045	0.025	0.055	0.03
10		eShop	22	30	9.7	72	10	0.2	0.06	0.04	0.08	0.045
12		eShop	26	36	11.6	83	12	0.3	0.07	0.04	0.09	0.05
16		eShop	36	42	15.5	92	16	0.3	0.085	0.05	0.11	0.055
20		eShop	41	52	19.5	104	20	0.3	0.1	0.07	0.13	0.08

PRODUCED IN A WAY THAT CONSERVES RESOURCES.



Carbide rod

- Made from more than 99% secondary raw materials.
- The carbon footprint of the carbide rod during production is reduced * by approx. 65% compared to a conventionally produced carbide rod.
- Same mechanical properties as a conventional carbide rod.

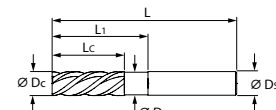
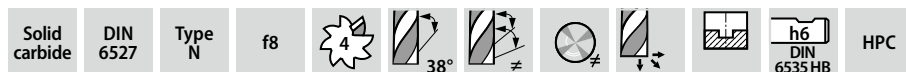
Furthermore:

- Milling cutter production with electricity 100% from renewable sources.
- 100% recycled plastic packaging.
- Can be reground up to 3 times (see regrinding service from the Hoffmann Group).

Garant GREENPLUS

*The stated reduction in carbon footprint refers exclusively to the CO2 equivalent during production of the carbide rod.





HOLEX Solid carbide roughing end mill HPC

For **roughing and finishing.**

- 20 3037 – Up to 1xD into solid material **at very high feed rates** with smooth cutting action.
At maximum machining depths, ensure compliance with the ratio dimension L_c (cutting length) / $\varnothing D_c$ (cutting $\varnothing$)!
- 20 3044 – Up to 1.5xD into solid material **at very high feed rates** with smooth cutting action.

Advantage: Optimised flute form, eccentric relief ground, wide chip space.



203037



20 3044

Suitable for/ v_c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si												INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K						
20 3037/3044				250	200	180	160								70			120	●			○	●	●

Ø f8 D _c	12X	20 3037	12X	20 3044	L _c		L ₁	Ø D ₁	L		Ø D ₃	Corner chamfer width at 45°			
	Solid carbide roughing end mill														
	HPC				20 3037	20 3044	20 3044	20 3044	20 3037	20 3044				f _z	f _z
	mm	TiXSi		TiXSi	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm
3	eShop		eShop	5	8	13	2.8	50	57	6	0.1	0.02	0.025		
4	eShop		eShop	8	11	17	3.8	54	57	6	0.1	0.02	0.025		
5	eShop		eShop	9	13	19	4.8	54	57	6	0.1	0.03	0.04		
6	eShop		eShop	10	13	19	5.8	54	57	6	0.1	0.04	0.05		
8	eShop		eShop	12	21	25	7.7	58	63	8	0.2	0.05	0.06		
10	eShop		eShop	14	22	30	9.7	66	72	10	0.2	0.06	0.08		
12	eShop		eShop	16	26	36	11.6	73	83	12	0.3	0.07	0.09		
14	eShop		eShop	16	26	36	13.6	73	83	14	0.3	0.08	0.1		
16	eShop		eShop	22	36	42	15.5	82	92	16	0.3	0.08	0.1		
20	eShop		eShop	26	41	52	19.5	92	104	20	0.3	0.1	0.13		
25	—		eShop	—	68	78	24.5	—	136	25	0.3	0.12	0.16		



HOLEX Pro Steel solid carbide roughing end mill HPC

For **roughing and finishing.**

- 20 3052 – Up to 1xD into solid material **at very high feed rates** with smooth cutting action. At maximum machining depths, ensure compliance with the ratio dimension L_c (cutting length) / $\varnothing D_c$ (cutting $\varnothing$)!
- 20 3054 – Up to 1xD into solid material **at very high feed rates** with smooth cutting action. Dimensions to **manufacturer's standard**.

Advantage: Optimised flute form, eccentric relief ground, wide chip space.



203052



203054

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si 										INOX 	INOX 	Ti 	GG(G) 	Uni 						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 3052/3054				260	240	180	160						80			250	●		●	○	●	●	

Ø D _c	12X	20 3052	12X	20 3054	L _c		L ₁	Ø D ₁	L		Ø D ₃	Corner chamfer width at 45°		
	HOLEX Pro Steel solid carbide roughing end mill													
	HPC				20 3052	20 3054	20 3054	20 3054	20 3052	20 3054			f _z	f _z
mm	TiAlN	TiAlN			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3	eShop	eShop			6	8	12	2.8	54	57	6	0.13	0.02	0.025
4	eShop	eShop			8	11	15	3.8	54	57	6	0.18	0.02	0.025
5	eShop	eShop			9	13	17	4.8	54	57	6	0.2	0.03	0.04
6	eShop	eShop			10	13	21	5.5	54	57	6	0.2	0.04	0.05
8	eShop	eShop			12	19	27	7.5	58	63	8	0.2	0.05	0.06
10	eShop	eShop			14	22	32	9.5	66	72	10	0.3	0.06	0.08
12	eShop	eShop			16	26	38	11.5	73	83	12	0.3	0.07	0.09
14	eShop	eShop			18	26	42	13.5	75	83	14	0.3	0.08	0.1
16	eShop	eShop			22	32	44	15.5	82	92	16	0.4	0.08	0.1
18	eShop	eShop			24	32	50	17.5	84	92	18	0.4	0.1	0.13
20	eShop	eShop			26	38	54	19.5	92	104	20	0.5	0.1	0.13
25	—	eShop			—	45	60	24.5	—	125	25	0.5	0.12	0.16



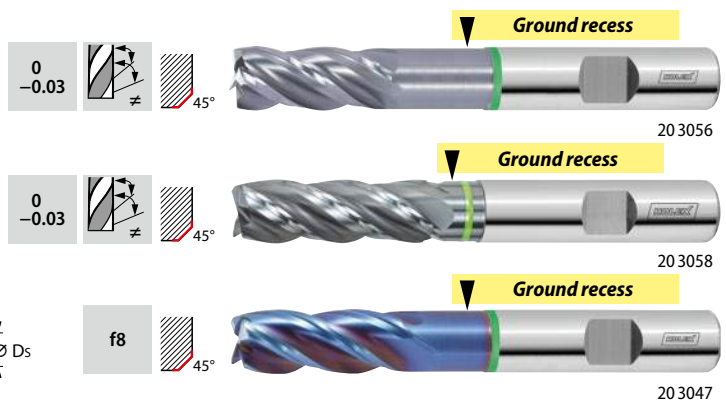
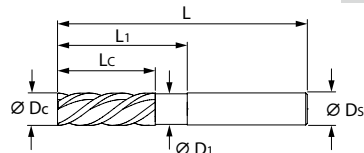
HOLEX Pro Steel solid carbide roughing end mill HPC

For **roughing and finishing**.

Up to $0.7 \times D$ into solid material at **very high feed rates** with smooth cutting action.

20 3047 – Without dynamic twist pitch.

Advantage: Optimised flute form, eccentric relief ground, wide chip space.



Suitable for/ V _c [m/min]	Alu plastics 	Alu cast > 10% Si											INOX	INOX	Ti	GG(G)	Uni						
	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
ISO code																							
20 3047				250	200	180	160						70				120	●	●	○	●	●	
20 3056/3058				260	240	180	160						80				250	●	●	○	●	●	

Ø D _c	12X	20 3056	12X	20 3058	12X	20 3047	L _c		L ₁		Ø D ₁		L	Ø D _s	Corner chamfer width at 45°			
	HOLEX Pro Steel solid carbide roughing end mill						Solid carbide roughing end mill										f _z f _{z1}	f _z f _{z2}
	HPC						20 3056	20 3058 20 3047	20 3056	20 3058 20 3047	20 3056 20 3058	20 3047			20 3056 20 3058	20 3047		
mm	TiAlN	TiAlN	TiSi	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
5	eShop	eShop	—	13	18	25	24	4.8	—	62	6	0.2	—	0.03	0.04			
6	eShop	eShop	eShop	13	18	25	24	5.5	5.8	62	6	0.2	0.1	0.04	0.05			
8	eShop	eShop	eShop	19	24	32	30	7.5	7.7	68	8	0.2	0.2	0.05	0.06			
10	eShop	eShop	eShop	22	30	40	38	9.5	9.7	80	10	0.3	0.2	0.06	0.08			
12	eShop	eShop	eShop	26	36	48	46	11.5	11.6	93	12	0.3	0.3	0.07	0.09			
16	eShop	eShop	eShop	32	48	56	58	15.5	15.5	108	16	0.4	0.3	0.08	0.1			
20	eShop	eShop	eShop	38	60	70	74	19.5	19.5	126	20	0.5	0.3	0.1	0.13			



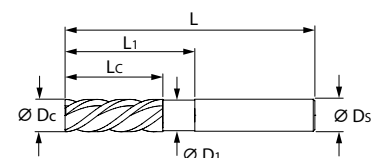
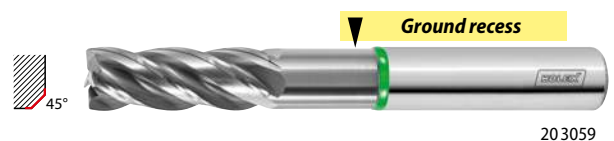
HOLEX Pro Steel solid carbide roughing end mill HPC

For **roughing and finishing**.

Up to $0.5 \times D$ into solid material at **very high feed rates** with smooth cutting action.

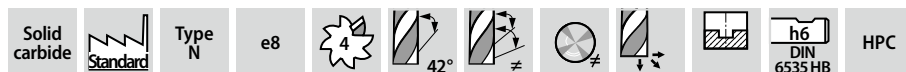
Extra-long version for avoiding interference contours.

Advantage: Optimised flute form, eccentric relief ground, generous chip spaces.



Suitable for/ v_c [m/min]	Alu plastics 	Alu cast > 10% Si 	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	K							
20 3059				200	190	140	120						60			200	●		●	○	●	●	

$\varnothing D_c$	12X	20 3059	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner chamfer width at 45°	f_z	f_z
		HOLEX Pro Steel solid carbide roughing end mill								
		HPC								
mm		TiAlN								
6		eShop	22	29	5.5	65	6	0.1	0.03	0.04
8		eShop	28	36	7.5	80	8	0.2	0.04	0.05
10		eShop	33	54	9.5	100	10	0.2	0.05	0.06
12		eShop	33	54	11.5	100	12	0.3	0.06	0.07
16		eShop	53	84	15.5	150	16	0.3	0.07	0.09
20		eShop	68	84	19.5	150	20	0.3	0.09	0.11

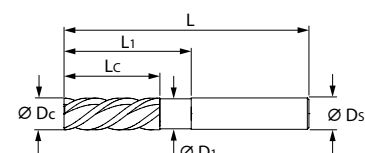
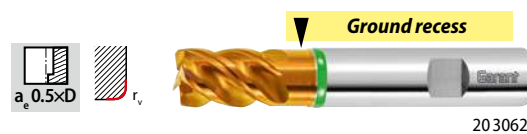


Garant **GARANT Master UNI solid carbide milling cutter HPC**

For roughing and finishing at very high feed rates with smooth cutting action. Newly developed geometry and high-performance coating for excellent production results with maximum tool life in various materials. High intrinsic stability and smooth cutting action due to unequal spacing.

Advantage:

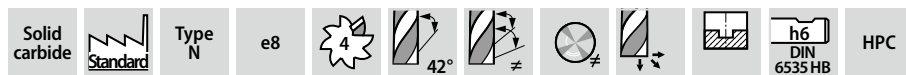
- Particularly low vibration running.
- Special flute profile, large flutes.
- Specially matched edge honing.
- Optimised substrate for hardness and toughness.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 3062–20 3073		280		260	240	190	180	150						90	80	40	250	●		●	○	●	●

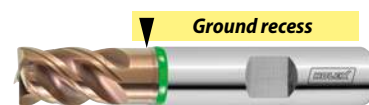
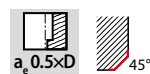
Ø e8 D _c	11Z 20 3062		11Z 20 3067		L _c		L _i		Ø D ₁		L		Ø D _s	Corner rounding r _v				
	GARANT Master UNI solid carbide milling cutter																	
	HPC		20 3062	20 3067	20 3062	20 3067	20 3062	20 3067	20 3062	20 3067			20 3062	20 3067				
mm	TiSiN	TiSiN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3	eShop	eShop	5	8	10	13	2.8	2.8	50	57	6	0.1	0.06	0.02	0.012	0.025	0.015	
4	eShop	eShop	8	11	14	17	3.8	3.8	54	57	6	0.1	0.08	0.02	0.012	0.025	0.015	
5	eShop	eShop	9	13	16	19	4.8	4.8	54	57	6	0.1	0.1	0.03	0.025	0.04	0.03	
6	eShop	eShop	10	13	16	19	5.8	5.8	54	57	6	0.1	0.1	0.04	0.025	0.05	0.03	
8	eShop	eShop	12	21	20	25	7.7	7.7	58	63	8	0.2	0.2	0.05	0.025	0.06	0.03	
10	eShop	eShop	14	22	24	30	9.7	9.7	66	72	10	0.2	0.2	0.06	0.04	0.08	0.05	
12	eShop	eShop	16	26	26	36	11.5	11.6	73	83	12	0.3	0.3	0.07	0.04	0.09	0.05	
16	eShop	eShop	22	36	32	42	15.5	15.5	82	92	16	0.3	0.3	0.08	0.05	0.1	0.06	
20	eShop	eShop	26	41	40	52	19.5	19.5	92	104	20	0.3	0.3	0.1	0.07	0.13	0.08	
25	—	eShop	—	68	—	80	—	24.5	—	136	25	—	0.3	0.12	0.08	0.16	0.09	

Ø e8 D _c	11Z 20 3073	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner rounding r _v				
	GARANT Master UNI solid carbide milling cutter										
	HPC TiSiN							f _z	f _z	f _z	f _z
mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
6	eShop	18	24	5.8	65	6	0.1	0.03	0.02	0.04	0.025
8	eShop	24	30	7.7	70	8	0.2	0.04	0.02	0.05	0.025
10	eShop	30	38	9.7	80	10	0.2	0.05	0.035	0.07	0.04
12	eShop	36	46	11.6	93	12	0.3	0.06	0.035	0.08	0.04
16	eShop	48	58	15.5	110	16	0.3	0.07	0.04	0.09	0.05

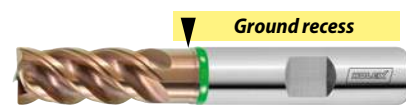


HOLEX Pro UNI solid carbide milling cutter HPC

For **roughing and finishing at very high feed rates** with smooth cutting action. **Newly developed geometry and high-performance coating** for excellent production results with maximum tool life in various materials. **High intrinsic stability** and smooth cutting action due to unequal spacing.



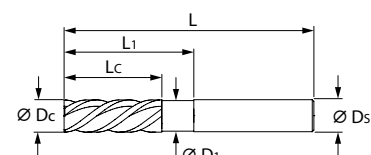
20 3063



20 3068



20 3074



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 3063–20 3074		250		240	220	180	170	140						90	80	35	240						

Ø e8 D _c	12Y	20 3063	12Y	20 3068	L _c	L ₁	Ø D ₁	L	Ø D ₃	Corner chamfer width at 45°									
HOLEX Pro UNI solid carbide milling cutter																			
HPC				20 3063	20 3068	20 3063	20 3068	20 3063	20 3068	20 3063	20 3068	20 3063	20 3068	20 3063	20 3068	f _z	f _z	f _z	f _z
mm	TiSiN	TiSiN		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3	—	eShop		—	8	—	13	—	2.8	—	57	6	—	0.06	0.02	0.012	0.025	0.015	
4	eShop	eShop		8	11	14	17	3.8	3.8	54	57	6	0.1	0.08	0.02	0.012	0.025	0.015	
5	eShop	eShop		9	13	16	19	4.8	4.8	54	57	6	0.1	0.1	0.03	0.025	0.04	0.03	
6	eShop	eShop		10	13	16	19	5.8	5.8	54	57	6	0.1	0.1	0.04	0.025	0.05	0.03	
8	eShop	eShop		12	21	20	25	7.7	7.7	58	63	8	0.2	0.2	0.05	0.025	0.06	0.03	
10	eShop	eShop		14	22	24	30	9.7	9.7	66	72	10	0.2	0.2	0.06	0.04	0.08	0.05	
12	eShop	eShop		16	26	26	36	11.5	11.6	73	83	12	0.3	0.3	0.07	0.04	0.09	0.05	
16	eShop	eShop		22	36	32	42	15.5	15.5	82	92	16	0.3	0.3	0.08	0.05	0.1	0.06	
20	eShop	eShop		26	41	40	52	19.5	19.5	92	104	20	0.3	0.3	0.1	0.07	0.13	0.08	
25	—	eShop		—	68	—	80	—	24.5	—	136	25	—	0.3	0.12	0.08	0.16	0.09	

Ø e8 D _c	12Y	20 3074	L _c	L ₁	Ø D ₁	L	Ø D ₃	Corner chamfer width at 45°											
HOLEX Pro UNI solid carbide roughing end mill																			
HPC																			
mm	TiSiN		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
6	eShop		18	24	5.8	65	6	0.1	0.03	0.02	0.04	0.025							
8	eShop		24	30	7.7	70	8	0.2	0.04	0.02	0.05	0.025							
10	eShop		30	38	9.7	80	10	0.2	0.05	0.035	0.07	0.04							
12	eShop		36	46	11.6	93	12	0.3	0.06	0.035	0.08	0.04							
16	eShop		48	58	15.5	110	16	0.3	0.07	0.04	0.09	0.05							



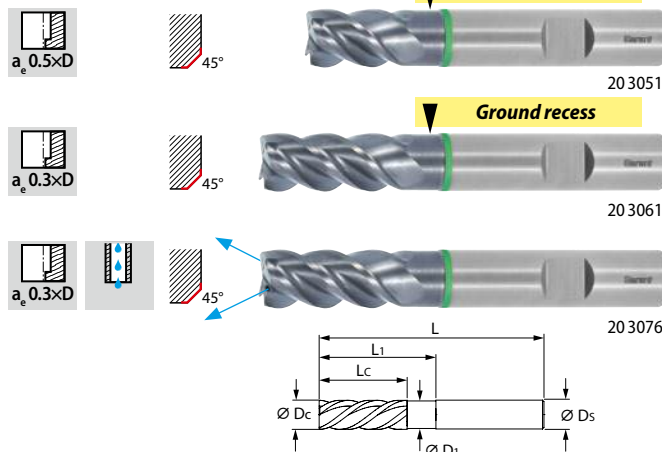
Garant Solid carbide roughing end mill MTC

For **roughing and finishing** up to $1.5 \times D$ into solid material **at very high feed rates** with smooth cutting action.

For cutting force reduction and better surface quality due to **45° helix**.

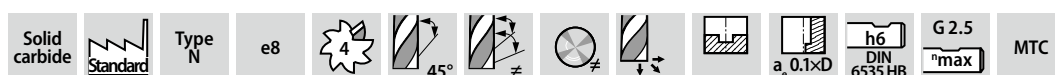
Improved coating for a further reduction in cutting force combined with increased tool life

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.



Suitable for/ v _c [m/min]	Alu plastics ○222	Alu ○223	Alu cast > 10% Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K							
20 3051/3061				250	230	200	180	150						70	50		150	●		●	○	●	●	●
20 3076				250	230	200	180	150						80	60		170	●		●	○	●	●	●

Ø e8 D _c	11X	20 3051	11X	20 3061	11X	20 3076	L _c		L ₁		Ø D ₁		L		Ø D ₃		Corner chamfer width at 45°	  < 900 N f _t
	Solid carbide roughing end mill																	
	MTC		MTC		MTC with through-coolant		20 3051	20 3061 20 3076	20 3051	20 3061	20 3051 20 3061	20 3051	20 3061 20 3076					
	AlCrN		AlCrN		AlCrN		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3	eShop		eShop		—	5	8	10	13	2.8	50	57	6	0.1	0.058			
4	eShop		eShop		eShop	8	11	14	17	3.8	54	57	6	0.1	0.058			
5	eShop		eShop		eShop	9	13	16	19	4.8	54	57	6	0.1	0.07			
6	eShop		eShop		eShop	10	13	16	19	5.8	54	57	6	0.1	0.07			
8	eShop		eShop		eShop	12	21	20	25	7.7	58	63	8	0.2	0.07			
10	eShop		eShop		eShop	14	22	24	30	9.7	66	72	10	0.2	0.09			
12	eShop		eShop		eShop	16	26	26	36	11.6	73	83	12	0.3	0.09			
14	eShop		eShop		—	16	26	26	36	13.6	73	83	14	0.3	0.13			
16	eShop		eShop		eShop	22	36	32	42	15.5	82	92	16	0.3	0.13			
18	eShop		eShop		—	22	36	32	42	17.5	82	92	18	0.3	0.155			
20	eShop		eShop		eShop	26	41	40	52	19.5	92	104	20	0.3	0.155			



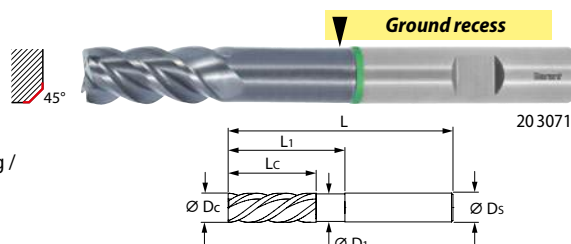
Garant Solid carbide roughing end mill MTC

For **roughing and finishing** up to $0.7 \times D$ into solid material **at very high feed rates** with smooth cutting action.

For cutting force reduction and better surface quality due to **45° helix**.

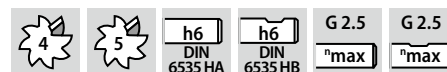
Improved coating for a further reduction in cutting force combined with increased tool life.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10% Si 											INOX	INOX	Ti	GG(G)	Uni					
	> 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	> 850 N									
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K					
	20 3071			100	90	85	80							40	30		100	●	●	○	●	●

Ø e8 D _c	1X	20 3071	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°		
	Solid carbide roughing end mill									
	MTC								f _z	f _z
mm	AlCrN		mm	mm	mm	mm	mm	mm	mm	
6	eShop		13	42	5.8	80	6	0.1	0.03	0.04
8	eShop		21	62	7.7	100	8	0.2	0.03	0.04
10	eShop		22	58	9.7	100	10	0.2	0.04	0.05
12	eShop		26	73	11.6	120	12	0.3	0.04	0.05
16	eShop		36	100	15.5	150	16	0.3	0.05	0.065
20	eShop		41	98	19.5	150	20	0.3	0.06	0.08



GARANT Master Alu solid carbide milling cutter TPC with more chip separators

Specially designed for TPC high-performance milling.

Optimised bending strength due to the use of ultra-fine grain substrates.

1×D chip separator for controlled chip breaking.

Balanced for very high process reliability and protecting the machine at high speeds.

Application: Especially for milling **aluminium and non-ferrous metals**.

Note:

20 3113 – $h_{\max}$: The values stated in the table are maximum values.
 $a_{e\max} = 0.15 \times D$ for TPC machining.

20 3114 – $h_{\max}$: The values stated in the table are maximum values.
 $a_{e\max} = 0.12 \times D$ for TPC machining.

Successor product for No. 202281, 202282.

20 3115 – $h_{\max}$: The values stated in the table are maximum values.
 $a_{e\max} = 0.1 \times D$ for TPC machining.

Successor product for No. 202283, 202284.



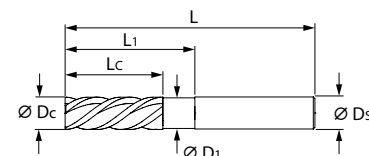
20 3113



20 3114



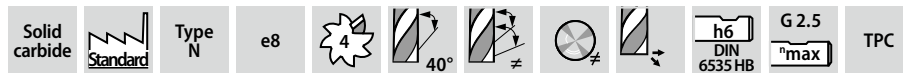
20 3115



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 3113	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200					
20 3114/3115	500	450	400	180	140	180	130	110		160	140	120	140	260		260	140	120					

$\varnothing h_6$ D_c	TPC	No. of teeth Z	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Number of chip separators	Shank form	Corner rounding r_v	TPC Alu $h_{\max}$
mm	DLC		mm	mm	mm	mm	mm			mm	mm
5	eShop	4	17	24	4.5	65	6	2	HA	0.05	0.036
6	eShop	4	18	25	5.5	65	6	2	HA	0.05	0.043
8	eShop	4	24	30	7.5	70	8	2	HA	0.1	0.057
10	eShop	4	30	35	9.5	80	10	2	HB	0.1	0.071
12	eShop	4	36	45	11	93	12	2	HB	0.1	0.086
16	eShop	5	48	55	15	110	16	2	HB	0.2	0.114
20	eShop	5	60	70	19	125	20	2	HB	0.2	0.143

$\varnothing h_6$ D_c	TPC	No. of teeth Z	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Number of chip separators	Shank form	Corner rounding r_v	TPC Alu $h_{\max}$
mm	DLC		mm	mm	mm	mm	mm			mm	mm
4	eShop	4	17	23	3.7	65	6	3	HA	0.05	0.026
5	eShop	4	21	30	4.5	70	6	3	HA	0.05	0.032
6	eShop	4	25	30	5.5	70	6	3	HA	0.05	0.039
8	eShop	4	33	40	7.5	80	8	3	HA	0.1	0.052
10	eShop	4	41	50	9.5	90	10	3	HB	0.1	0.065
12	eShop	4	49	60	11	110	12	3	HB	0.1	0.078
16	eShop	5	65	80	15	130	16	3	HB	0.2	0.104
20	eShop	5	82	100	19	150	20	3	HB	0.2	0.13



HOLEX Solid carbide milling cutter TPC with chip separators

High-performance end mill for general-purpose applications, **specially designed for TPC applications.**

Strengthened core.

Optimised bending strength due to the use of ultra-fine grain substrates.

Chip breaker for controlled chip breaking.

Note: $h_{\max}$: The values stated in the table are maximum values.

20 3085 – $a_{e\max} = 0.18 \times D$ for TPC machining.

20 3086 – $a_{e\max} = 0.07 \times D$ for TPC machining.

20 3087 – $a_{e\max} = 0.05 \times D$ for TPC machining.

TPC
 $a_{e\max}$
 $0.18 \times D$



20 3085

TPC
 $a_{e\max}$
 $0.07 \times D$

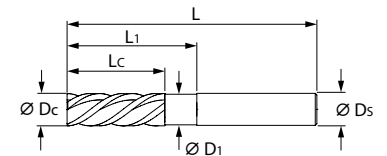


20 3086

TPC
 $a_{e\max}$
 $0.05 \times D$



20 3087



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
20 3085				360	330	290	220	140						180	150			•				•	•
20 3086				350	320	280	210	135						170	145			•				•	•
20 3087				340	300	260	190	115						160	110			•				•	•

$\varnothing$ e8 D _c	12X	20 3085	L _c	L ₁	$\varnothing$ D ₁	L	$\varnothing$ D _s	Number of chip separators	Corner chamfer width at 45°	TPC h _{max} < 900N
		Solid carbide milling cutter with chip separators								
mm		TPC TiSiN	mm	mm	mm	mm	mm		mm	mm
4		eShop	16	23	3.9	65	6	1	0.08	0.046
5		eShop	17	24	4.8	65	6	1	0.1	0.052
6		eShop	18	25	5.8	65	6	1	0.12	0.058
8		eShop	24	30	7.8	70	8	1	0.16	0.062
10		eShop	30	35	9.8	80	10	1	0.2	0.074
12		eShop	36	45	11.8	93	12	1	0.24	0.092
16		eShop	48	55	15.8	110	16	1	0.32	0.12
20		eShop	60	70	19.8	126	20	1	0.4	0.134

Ø e8 D _c	12X	20 3086	12X	20 3087	L _c		L ₁		Ø D ₁	L		Ø D _s	Number of chip separators	Corner chamfer width at 45°	  h _{max}
	Solid carbide milling cutter with chip separators														
	TPC				20 3086	20 3087	20 3086	20 3087		20 3086	20 3087				
	mm	TiSiN		TiSiN	mm	mm	mm	mm	mm	mm	mm	mm			
5	eShop	—		20	—	30	—	4.8	70	—	6	2	0.1	0.052	
6	eShop	—		24	—	30	—	5.8	70	—	6	2	0.1	0.058	
8	eShop	eShop		32	40	40	48	7.8	80	90	8	2	0.12	0.062	
10	eShop	eShop		40	50	50	60	9.8	90	104	10	2	0.16	0.074	
12	eShop	eShop		48	60	60	72	11.8	110	120	12	2	0.2	0.091	
16	eShop	eShop		64	80	80	96	15.8	130	150	16	2	0.32	0.12	
20	eShop	eShop		80	100	100	120	19.8	150	175	20	2	0.4	0.134	



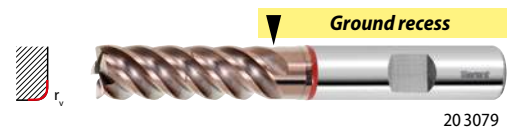
Garant Solid carbide milling cutter TPC with chip separators

High-performance slot drill for machining materials up to 60 HRC, specially designed for TPC applications.

Strengthened core. With corner radii similar to torus cutters.

Chip breakers for controlled chip breaking.

Note: $h_{\max}$: The values stated in the table are maximum values.
 $a_{e\max} = 0.05 \times D$ for TPC machining.
Successor product to No. 203077.



203079

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
203079									150	140	125	110											

$\varnothing f8$ D_c	11X 203079	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Number of chip separators	Corner rounding r_v	TPC < 60 HRC $h_{\max}$
mm	Solid carbide milling cutter with chip separators TPC TiAlN	mm	mm	mm	mm	mm		mm	mm
6	eShop	18	25	5.8	62	6	1	0.1	0.02
8	eShop	24	30	7.8	68	8	1	0.2	0.022
10	eShop	30	35	9.8	80	10	1	0.2	0.031
12	eShop	36	45	11.8	93	12	1	0.3	0.035
16	eShop	48	55	15.8	108	16	1	0.3	0.049
20	eShop	60	70	19.8	126	20	1	0.3	0.062



Garant Solid carbide milling cutter TPC with chip separators

High-performance mills for machining stainless steels,

specially designed for TPC applications.

Strengthened core.

Note: $h_{\max}$: The values stated in the table are maximum values.
 $a_{e\max} = 0.08 \times D$ for TPC machining.
NEW GENERATION AVAILABLE!
Recommended successor product is No. 203117



203019

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
203019				380	340	300	230							240	170								

$\varnothing f8$ D_c	11X 203019	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Number of chip separators	Corner chamfer width at 45°	TPC < 900 N $h_{\max}$	TPC > 900 N $h_{\max}$
mm	Solid carbide milling cutter with chip separators TPC TiAlN	mm	mm	mm	mm	mm		mm	mm	mm
4	eShop	16	23	3.9	62	6	1	0.08	0.025	0.02
5	eShop	17	24	4.8	62	6	1	0.1	0.03	0.025
6	eShop	18	25	5.8	62	6	1	0.12	0.04	0.03
8	eShop	24	30	7.8	68	8	1	0.16	0.05	0.04
10	eShop	30	35	9.8	80	10	1	0.2	0.06	0.05
12	eShop	36	45	11.8	93	12	1	0.24	0.07	0.06
16	eShop	48	55	15.8	108	16	1	0.32	0.09	0.075
20	eShop	60	70	19.8	126	20	1	0.4	0.125	0.105

Solid carbide	DIN 6527	Type N	e8					TPC $a_{e\max}$ $0.08 \times D$		HPC	TPC
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Garant GARANT Master Titan solid carbide milling cutter HPC/TPC

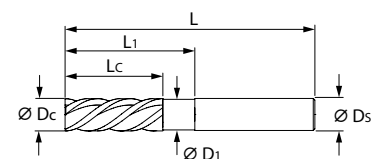
For roughing and finishing at very high feed rates and smooth cutting action for the best tool life and high metal removal rate.

Specially ground with corner radii similar to torus cutters and **special coating.**

Dimensions to DIN 6527 long.

Application: For milling **titanium and titanium alloys.**

Note:	Can be reground when used as a TPC milling cutter.
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203157

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10% Si 											INOX	INOX	Ti	Graphite GRP CRP	Uni					
	ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	60				

Ø e8 D _c	11Z	20 3157						Corner rounding r _v		
	GARANT Master Titan solid carbide milling cutter						Ti		Ti	
	HPC/TPC						> 850 N		> 850 N	
mm	TiAlN	mm	mm	mm	mm	mm	mm	f _z	f _z	
4	eShop	11	16	3.8	57	6	0.1	0.015	0.018	
5	eShop	13	18	4.8	57	6	0.1	0.018	0.022	
6	eShop	13	20	5.8	57	6	0.1	0.022	0.026	
8	eShop	19	25	7.7	63	8	0.2	0.028	0.034	
10	eShop	22	32	9.7	72	10	0.2	0.034	0.042	
12	eShop	26	38	11.6	83	12	0.2	0.04	0.05	
16	eShop	32	44	15.5	92	16	0.3	0.05	0.065	
20	eShop	41	54	19.5	104	20	0.3	0.06	0.08	

Solid carbide	DIN 6527	Type N	e8	5					TPC $a_{e\max}$ $0.08 \times D$			G 2.5 $n_{\max}$	HPC	TPC
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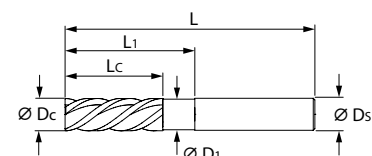
Garant GARANT Master Ni-Based solid carbide milling cutter HPC/TPC

Specially ground with **Torus-like corner radius.**

Innovative substrate specially for machining **nickel-based alloys**. Newly developed coating.

Application: For milling **nickel-based alloys** with high red hardness.

Note: Successor product to No. 203082.



203161

Suitable for/ v_c [m/min]	Alu plastics 	Alu cast > 10 % Si 											INOX 	INOX 	Ti 	Inconel' 	Graphite GRP CRP 					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	S	40					

Ø e8 D _c	112	20 3161	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner round- ing r _v	 Inconel [®]
	GARANT Master Ni-Based solid carbide milling cutter								
	HPC/TPC								
mm	TiAlN		mm	mm	mm	mm	mm	mm	f _z
3	eShop		8	13	2.8	57	6	0.2	0.03
4	eShop		11	17	3.8	57	6	0.2	0.035
5	eShop		13	19	4.8	57	6	0.2	0.04
6	eShop		13	19	5.8	57	6	0.2	0.05
8	eShop		21	25	7.7	63	8	0.2	0.065
10	eShop		22	30	9.7	72	10	0.2	0.07
12	eShop		26	36	11.6	83	12	0.2	0.075
16	eShop		36	42	15.5	92	16	0.3	0.08



Garant Solid carbide milling cutter TPC

High-performance milling cutter specially designed for general-purpose TPC applications.

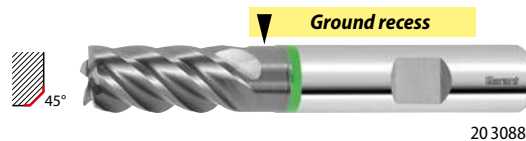
Strengthened core.

Optimised bending strength due to the use of ultra-fine grain substrates.

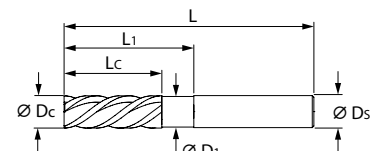
Note:

$a_{e \max} = 0.1 \times D$ for TPC machining.

$h_{\max}$: The values stated in the table are maximum values. For finishing operations we recommend items No. 204012, 204014 and 204015.



20 3088



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	HARDOX® 500 < 1600 N	INOX < 900 N	INOX > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M						
20 3088				380	340	300	230	150					60	40	25	220	150	●	●	●	○	●	

$\varnothing f8 D_c$	11X	20 3088	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner chamfer width at 45°	TPC TOOLOX® 44 HRC $h_{\max}$
mm		TPC TiAlN	mm	mm	mm	mm	mm	mm	mm
4		eShop	11	—	—	57	6	0.08	0.02
5		eShop	13	—	—	57	6	0.1	0.025
6		eShop	13	19	5.8	57	6	0.12	0.035
8		eShop	19	25	7.8	63	8	0.16	0.045
10		eShop	22	30	9.8	72	10	0.2	0.055
12		eShop	26	36	11.8	83	12	0.24	0.065
16		eShop	32	42	15.8	92	16	0.32	0.085
20		eShop	41	52	19.8	104	20	0.4	0.105

Milling processes compared



HPC

High Performance Cutting

- High feed rates.
- Very low degree of vibration due to unequal spacing.
- High chipping rates due to high a_p and a_e .

Lower cutting speeds than with HSC.

TPC

Trochoidal Performance Cutting

- Very high metal removal rate, especially when used on difficult-to-machine materials.
- Very high dynamic path speed.
- Very low cutting force.
- Low wear.
- High savings potential compared to the conventional strategy.

Requirements for successful TPC machining

- A modern CAM system or modern machine control.
- A machining centre with the most dynamic characteristics possible.
- TPC tools from GARANT – specially developed for the requirements in trochoidal application.



Solid carbide milling cutter TPC with chip separators

High-performance end mill for general-purpose applications, **specially designed for TPC applications.**

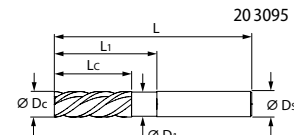
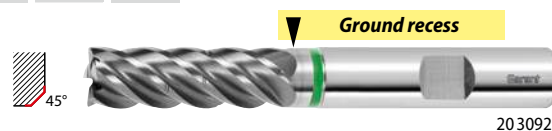
Strengthened core.

Optimised bending strength due to the use of ultra-fine grain substrates.

Offset chip breakers for controlled chip breaking.

Note: $a_{e\max} = 0.07 \times D$ for TPC machining.
 $h_{\max}$: The values stated in the table are maximum values. For finishing operations we recommend items No. 204012, 204014 and 204015.

20 3092 – **Successor product to No. 203089.**



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 										TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	HARDOX [®] 500 < 1600 N	INOX < 900 N	INOX > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M						
20 3092/3095				380	340	300	230	150				60	40	25	220	150	●		●		○	●

Ø f8 D _c	1X		2X		L _c	L ₁	Ø D ₁	L	Ø D _s	Number of chip separators		Corner chamfer width at 45°	 TOOLUX [®] 44 HRC h _{max}
	20 3092		20 3095							20 3092	20 3095		
	Garant		HOLEX										
Solid carbide milling cutter with chip separators													
	TPC												
mm	TiAlN		TiAlN		mm	mm	mm	mm	mm			mm	mm
4	eShop		eShop		16	23	3.9	62	6	1	1	0.08	0.018
5	eShop		eShop		17	24	4.8	62	6	1	1	0.1	0.023
6	eShop		eShop		18	25	5.8	62	6	1	1	0.12	0.032
8	eShop		eShop		24	30	7.8	68	8	1	1	0.16	0.042
10	eShop		eShop		30	35	9.8	80	10	1	1	0.2	0.051
12	eShop		eShop		36	45	11.8	93	12	2	1	0.24	0.06
14	eShop		eShop		42	50	13.8	99	14	2	1	0.28	0.069
16	eShop		eShop		48	55	15.8	108	16	2	1	0.32	0.078
20	eShop		eShop		60	70	19.8	126	20	2	1	0.4	0.097



Garant Solid carbide milling cutter TPC with chip separators

High-performance end mill for general-purpose applications, **specially designed for TPC applications.**

Strengthened core.

Optimised bending strength due to the use of ultra-fine grain substrates.

Offset chip breakers for controlled chip breaking.

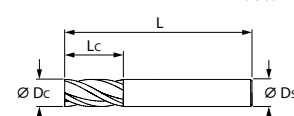
Note: $h_{\max}$: The values stated in the table are maximum values. For finishing operations we recommend items No. 204016, 204018 and 204019.

20 3093 – $a_{\theta, \max} = 0.05 \times D$ for TPC machining.

Successor product to No. 203090.

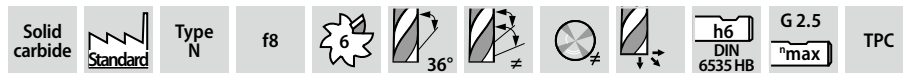
20 3094 – $a_{\text{max}} = 0.03 \times D$ for TPC machining.

Successor product to No. 203091.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast Si 	Alu cast Si 								TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	HARDOX [®] 500 HRC	INOX	INOX	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M					
20 3093				380	340	300	230	150				60	40	25	220	150	●	●		○	●
20 3094				350	310	270	200	120				50	30	20	190	120	●	●		○	●

Ø f8 D _c	11X	20 3093	11X	20 3094	L _c		L		Ø D _s	Number of chip separators		Corner chamfer width at 45°	TPC TOOLOX[®] 44 HRC h_{max}	
	Solid carbide milling cutter with chip separators													
	TPC				20 3093	20 3094	20 3093	20 3094		20 3093	20 3094		20 3093	20 3094
	mm	TiAlN		TiAlN		mm	mm	mm		mm	mm			mm
5	eShop		—		20	—	66	—	6	2	—	0.1	0.021	—
6	eShop		—		24	—	66	—	6	2	—	0.12	0.029	—
8	eShop		eShop		32	40	74	81	8	2	3	0.16	0.038	0.03
10	eShop		eShop		40	50	89	96	10	2	3	0.2	0.046	0.037
12	eShop		eShop		48	60	100	112	12	2	3	0.24	0.054	0.044
16	eShop		eShop		64	80	123	136	16	2	3	0.32	0.071	0.057
20	eShop		eShop		80	100	140	160	20	2	3	0.4	0.088	0.07



GARANT Master INOX solid carbide milling cutter TPC with chip separators

High-performance milling cutter with **irregular cutter spacing** and **irregular helical pitch**.

High process reliability and **better chip evacuation** due to **increased flutes**.

Optimised carbide substrate for **higher bending strength** and **extreme tool life**, even in stainless steels in the high-performance field, especially duplex.

Chip separator positioned offset at **cutting edges**.

203120 – Internal cooling version for improved chip evacuation.

Advantage: Lower pull-out forces due to reduced helix angle.

Note:

h_{max} : The values stated in the table are maximum values. For finishing operations we recommend items No. 204012, 204014, 204015, 204016, 204018 and 204019.

203116 – $a_{e max} = 0.12 \times D$ for TPC machining.

203118 – $a_{e max} = 0.07 \times D$ for TPC machining.

Successor product for No. 203104 and No. 203107.

203119 – $a_{e max} = 0.04 \times D$ for TPC machining.

Successor product for No. 203105 and No. 203108.

203117/3120 – $a_{e max} = 0.1 \times D$ for TPC machining.

TPC
 $a_{e max}$
 $0.12 \times D$

45°

Ground recess

203116

TPC
 $a_{e max}$
 $0.1 \times D$

45°

Ground recess

203117

TPC
 $a_{e max}$
 $0.1 \times D$

45°

Ground recess

203120

TPC
 $a_{e max}$
 $0.07 \times D$

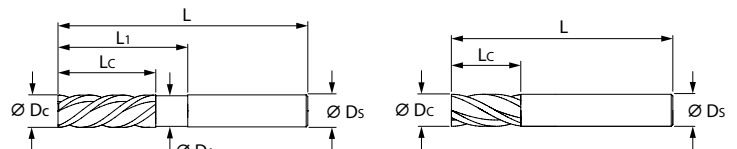
45°

203118

TPC
 $a_{e max}$
 $0.04 \times D$

45°

203119



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
203116/3117/3120				380	340	300	230							240	170	140				●	○	●	●
203118				320	290	260	200							220	160	120				●	○	●	●
203119				270	240	210	160							200	140	100				●	○	●	●

Ø f8 D _c	11Z	20 3116	11Z	20 3117	11Z	20 3120	L _c		L ₁		Ø D ₁	L		Ø D _s	Number of chip separators		Corner chamfer width at 45°	TPC INOX < 900 N h_{max}	
	GARANT Master INOX solid carbide milling cutter with chip separators						GARANT Master INOX solid carbide milling cutter with chip separators and internal cooling												
	TPC						20 3116	20 3117	20 3116	20 3117		20 3116	20 3117		20 3116	20 3117		20 3116	20 3117
mm	TiAlN		TiAlN		TiAlN		mm	mm	mm	mm	mm	mm	mm	mm			mm	mm	mm
4	eShop		eShop		—		11	16	—	23	3.9	57	62	6	—	1	0.08	0.026	0.024
5	eShop		eShop		—		13	17	—	24	4.8	57	62	6	—	1	0.1	0.032	0.03
6	eShop		eShop		—		13	18	19	25	5.8	57	62	6	—	1	0.12	0.039	0.036
8	eShop		eShop		eShop		19	24	25	30	7.8	63	68	8	—	1	0.16	0.052	0.048
10	eShop		eShop		eShop		22	30	30	35	9.8	72	80	10	—	1	0.2	0.065	0.06
12	eShop		eShop		eShop		26	36	36	45	11.8	83	93	12	1	2	0.24	0.078	0.072
14	—		eShop		—		—	42	—	50	13.8	—	99	14	—	2	0.28	—	0.084
16	eShop		eShop		eShop		32	48	42	55	15.8	92	108	16	1	2	0.32	0.104	0.096
20	eShop		eShop		—		41	60	52	70	19.8	104	126	20	1	2	0.4	0.13	0.12

Ø f8 D _c	11Z	20 3118	11Z	20 3119	L _c		L		Ø D _s	Number of chip separators	Corner chamfer width at 45°	 INOX < 900 N	
	GARANT Master INOX solid carbide milling cutter with chip separators											h _{max}	
	TPC				20 3118	20 3119	20 3118	20 3119				20 3118	20 3119
	mm	TiAlN	TiAlN	mm	mm	mm	mm	mm				mm	mm
5	eShop	—	20	—	66	—	6	2	—	0.1	0.026	—	
6	eShop	—	24	—	66	—	6	2	—	0.12	0.031	—	
8	eShop	eShop	32	40	74	81	8	2	3	0.16	0.041	0.031	
10	eShop	eShop	40	50	89	96	10	2	3	0.2	0.051	0.039	
12	eShop	eShop	48	60	100	112	12	2	3	0.24	0.061	0.047	
16	eShop	eShop	64	80	123	136	16	2	3	0.32	0.082	0.063	
20	eShop	eShop	80	100	140	160	20	2	3	0.4	0.102	0.078	



Solid carbide milling cutter TPC / Solid carbide milling cutter TPC with chip separators

High-performance milling cutter with **irregular cutter spacing** and **irregular helical pitch**. Optimised bending strength due to the use of ultra-fine grain substrates. **Offset chip breakers for controlled chip breaking.**

Note:

$h_{\max}$: The values stated in the table are maximum values. For finishing operations we recommend items No. 204012, 204014 and 204015.

20 3102 – $a_{e \max} = 0.1 \times D$ for TPC machining.

NEW GENERATION AVAILABLE!

Recommended successor product is No. 203116.

20 3106 – **NEW GENERATION AVAILABLE!**

Recommended successor product is No. 203117.

20 3106/3109 – $a_{e \max} = 0.07 \times D$ for TPC machining.



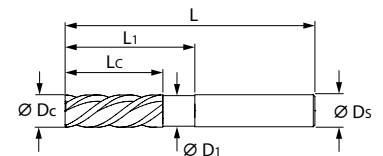
20 3102



20 3106



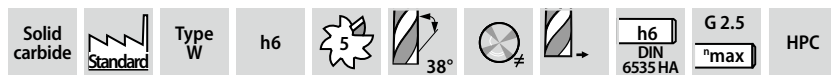
20 3109



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
20 3102–20 3109				380	340	300	230							240	170								

$\varnothing f8 D_c$	11X	20 3102	11X	20 3106	L_c		L_1		$\varnothing D_1$		L		$\varnothing D_s$	Number of chip separa- tors	Corner cham- fer width at 45°	TPC INOX < 900 N $h_{\max}$	
mm		TiAlN		TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm	20 3106	mm	mm	mm
4		eShop		eShop	11	16	—	23	—	3.9	57	62	6	1	0.08	0.02	0.018
5		eShop		eShop	13	17	—	24	—	4.8	57	62	6	1	0.1	0.025	0.023
6		eShop		eShop	13	18	19	25	5.8	5.8	57	62	6	1	0.12	0.035	0.032
8		eShop		eShop	19	24	25	30	7.8	7.8	63	68	8	1	0.16	0.045	0.042
10		eShop		eShop	22	30	30	35	9.8	9.8	72	80	10	1	0.2	0.055	0.051
12		eShop		eShop	26	36	36	45	11.8	11.8	83	93	12	2	0.24	0.065	0.06
16		eShop		eShop	32	48	42	55	15.8	15.8	92	108	16	2	0.32	0.085	0.078
20		eShop		eShop	41	60	52	70	19.8	19.8	104	126	20	2	0.4	0.105	0.097

$\varnothing f8 D_c$	12X	20 3109	L_c		L_1		$\varnothing D_1$		L		$\varnothing D_s$	Number of chip separa- tors	Corner cham- fer width at 45°	TPC INOX < 900 N $h_{\max}$	
mm		TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4		eShop	16	23	3.9	62	6	1	0.08	0.018					
5		eShop	17	24	4.8	62	6	1	0.1	0.023					
6		eShop	18	25	5.8	62	6	1	0.12	0.032					
8		eShop	24	30	7.8	68	8	1	0.16	0.042					
10		eShop	30	35	9.8	80	10	1	0.2	0.051					
12		eShop	36	45	11.8	93	12	1	0.24	0.06					
16		eShop	48	55	15.8	108	16	1	0.32	0.078					
20		eShop	60	70	19.8	126	20	1	0.4	0.097					



GARANT Master Alu solid carbide finishing cutter HPC

For finishing operations.

Special geometry for optimum chip evacuation.

Unequal spacing gives high intrinsic stability and smooth cutting action.

For profile milling as a finishing operation.

Note:

20 3203 – Order the **uncoated version** using **No. 203207**.

20 3204 – Order the **uncoated version** using **No. 203208**.

20 3205 – Order the **uncoated version** using **No. 203209**.



20 3203



20 3207



20 3204



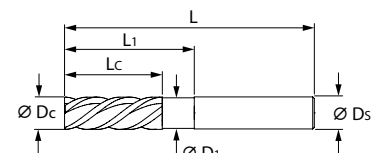
20 3208



20 3205



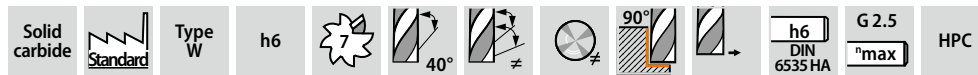
20 3209



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 3203	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200					
20 3204/3205	500	450	400	180	140	180	130	110		160	140	140	120	140		260	140	120					

$\varnothing$ h6 D _c	11X	20 3203	L _c	L ₁	$\varnothing$ D ₁	L	$\varnothing$ D _s	
		GARANT Master Alu solid carbide milling cutter, HPC						Alu
		HPC						f _z
		DLC						
mm			mm	mm	mm	mm	mm	mm
4		eShop	16	23	3.8	65	6	0.05
6		eShop	18	25	5.8	65	6	0.05
8		eShop	24	30	7.8	70	8	0.06
10		eShop	30	35	9.5	80	10	0.065
12		eShop	36	45	11.5	93	12	0.07
16		eShop	48	55	15.5	110	16	0.08
20		eShop	60	70	19.5	125	20	0.09

$\varnothing$ h6 D _c	11X	20 3204	11X	20 3205	L _c	L ₁	$\varnothing$ D ₁	L	$\varnothing$ D _s	
		GARANT Master Alu solid carbide milling cutter, HPC								Alu
		HPC								f _z
		DLC								
mm			mm	mm	mm	mm	mm	mm	mm	mm
6		eShop	24	—	32	—	65	—	6	0.045
8		eShop	32	40	40	48	75	80	8	0.05
10		eShop	40	50	48	58	90	100	10	0.06
12		eShop	48	60	56	68	100	119	12	0.06
16		eShop	64	80	72	88	125	134	16	0.07
20		eShop	80	100	88	108	150	175	20	0.08

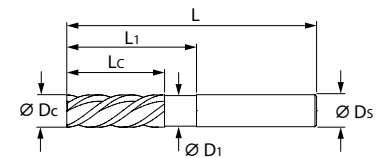
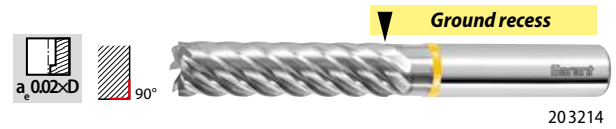
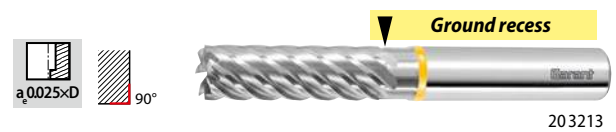


GARANT Master Alu solid carbide finishing cutter HPC

For fine finishing operations. Cutter geometry optimised for low infeeds and excellent surfaces. Unequal spacing gives high intrinsic stability and smooth cutting action.

Application: For profile milling as a finishing operation.

Note: Optimal production results in conjunction with the GARANT HiRunER precision ER collet chuck, GARANT Master Chuck hydraulic chuck and heavy-duty chuck.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 3213–20 3216	380	360	320	260	220	250	220	200									160	220					

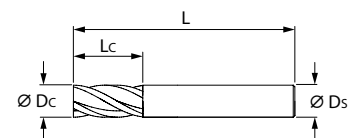
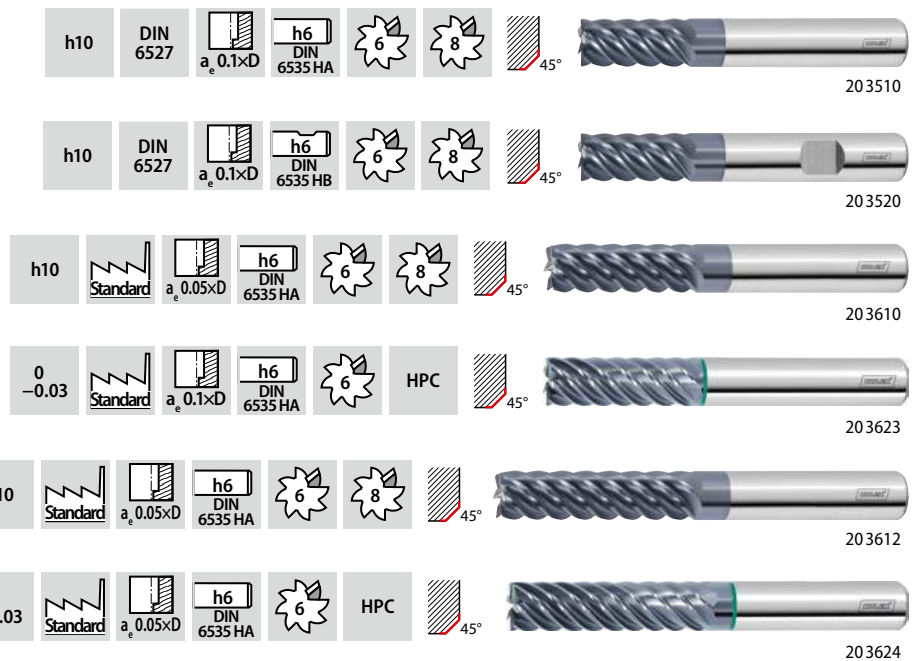
Ø h6 D _c	11X	20 3213	11X	20 3214	L _c		L ₁		Ø D ₁		L		Ø D _s		f _z	
		GARANT Master Alu solid carbide finishing cutter														
mm		HPC				20 3213	20 3214	20 3213	20 3214	mm	20 3213	20 3214	mm	20 3213	20 3214	mm
6		eShop		eShop		20	26	25	32	5.8	65	65	6	0.03		
8		eShop		eShop		26	34	30	40	7.8	70	75	8	0.03		
10		eShop		eShop		32	42	36	48	9.5	80	90	10	0.035		
12		eShop		eShop		39	51	46	56	11.5	93	100	12	0.035		
16		eShop		eShop		52	68	57	74	15.5	110	125	16	0.04		
20		eShop		eShop		64	84	72	90	19.5	125	150	20	0.04		

Ø h6 D _c	11X	20 3215	11X	20 3216	L _c		L ₁		Ø D ₁		L		Ø D _s		f _z	
		GARANT Master Alu solid carbide finishing cutter														
mm		HPC				20 3215	20 3216	20 3215	20 3216	mm	20 3215	20 3216	mm	20 3215	20 3216	mm
6		—		eShop		—	16	—	42	—	5.7	—	80	6	0.025	
8		eShop		eShop		42	19	48	62	7.8	7.4	80	100	8	0.025	
10		eShop		eShop		52	25	58	58	9.5	9.2	100	100	10	0.03	
12		eShop		eShop		63	30	68	73	11.5	11	119	119	12	0.03	
16		eShop		eShop		84	40	88	100	15.5	15	134	150	16	0.035	
20		eShop		—		105	—	113	—	19.5	—	175	—	20	0.035	

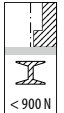

HOLEX Solid carbide milling cutter / HOLEX Pro Steel solid carbide finishing cutter HPC

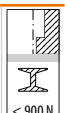
20 3510–3612 – **High stability and extremely smooth cutting action due to at least 6 teeth.** Eccentric relief ground. **For profile milling as a finishing operation.**

20 3623/3624 – For **finishing operations.** Special geometry for optimum chip evacuation. For **profile milling as a finishing operation.** Very sturdy version with strengthened core.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K							
20 3510/3520		600	400	190	170	160	95	85						90			120	○		●	○	○	○	○
20 3610/3612		600	400	190	170	160	95							90			120	○		●	○	○	○	○
20 3623				160	140	120	110	100	70					90	70			●		●	○	●	●	●
20 3624				120	110	100	90	80	60					80	60			●		●	○	●	●	●

Ø h10 D _c	12X 20 3510	12X 20 3520	No. of teeth Z	L _c	L	Ø D _s	Corner chamfer width at 45°	
mm	TiAlN	TiAlN		mm	mm	mm	mm	mm
5	eShop	eShop	6	13	57	6	0.1	0.032
6	eShop	eShop	6	13	57	6	0.1	0.054
8	eShop	eShop	6	19	63	8	0.1	0.063
10	eShop	eShop	6	22	72	10	0.1	0.072
12	eShop	eShop	6	26	83	12	0.1	0.08
16	eShop	eShop	6	32	92	16	0.1	0.089
20	eShop	eShop	8	38	104	20	0.1	0.107

Ø D _c	12X 20 3610	12X 20 3623	12X 20 3612	12X 20 3624	No. of teeth Z		L _c			L			Ø D _s	Corner chamfer width at 45°		 f _z
	Solid carbide milling cutter	HOLEX Pro Steel solid carbide finishing cutter	Solid carbide milling cutter	HOLEX Pro Steel solid carbide finishing cutter			20 3610 20 3612	20 3623 20 3624	20 3610 20 3612	20 3623 20 3624	20 3610 20 3612	20 3623 20 3624				
	mm	TiAlN	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
2	eShop	—	—	—	6	—	6.5	—	—	62	—	—	6	0.05	—	0.016
3	eShop	—	—	—	6	—	10	—	—	62	—	—	6	0.05	—	0.016
4	eShop	eShop	—	—	6	6	16	16	—	62	—	—	6	0.1	0.04	0.032
5	eShop	eShop	eShop	—	6	6	18	17	20	62	70	—	6	0.1	0.05	0.032
6	eShop	eShop	eShop	eShop	6	6	18	18	24	62	70	66	6	0.1	0.06	0.054
8	eShop	eShop	eShop	eShop	6	6	23	24	32	68	90	74	8	0.1	0.08	0.063
10	eShop	eShop	eShop	eShop	6	6	30	30	40	80	100	89	10	0.1	0.1	0.072
12	eShop	eShop	eShop	eShop	6	6	36	36	48	93	110	100	12	0.1	0.12	0.08
16	eShop	eShop	eShop	eShop	6	6	48	48	64	108	130	123	16	0.1	0.16	0.089
20	eShop	eShop	eShop	eShop	8	6	60	60	80	126	140	140	20	0.1	0.2	0.107
25	eShop	—	—	—	8	—	75	—	—	150	—	—	25	0.1	—	0.107



HOLEX Solid carbide milling cutter

For **finishing operations**. Special geometry for optimum chip evacuation. For **profile milling as a finishing operation**. Very sturdy version with strengthened core.

Application:

20 3620 – Very suitable for large depths of cut.



20 3617



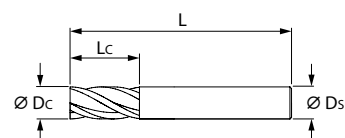
20 3618



20 3619



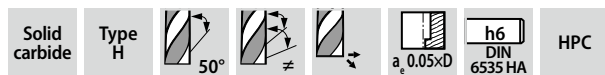
20 3620



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
20 3617/3618				160	140	120	110	100	70	60										●	○	●	●
20 3619/3620				120	110	100	90	80	60	50										●	○	●	●

Ø D _c	12X	20 3617	12X	20 3618	L _c		L		Ø D _s	 < 900 N f _z
	Solid carbide milling cutter									
	mm	TiAlN	TiAlN	20 3617 mm	20 3618 mm	20 3617 mm	20 3618 mm	mm		
3		eShop	—	6	—	54	—	6	0.016	
4		eShop	—	8	—	54	—	6	0.032	
5		eShop	eShop	9	13	54	57	6	0.032	
6		eShop	eShop	10	13	54	57	6	0.054	
8		eShop	eShop	12	19	58	63	8	0.063	
10		eShop	eShop	14	22	66	72	10	0.072	
12		eShop	eShop	16	26	73	83	12	0.08	
14		eShop	—	18	—	75	—	14	0.085	
16		eShop	eShop	22	32	82	92	16	0.089	
20		eShop	eShop	26	38	92	104	20	0.107	
25		—	eShop	—	45	—	125	25	0.107	

Ø D _c	12X	20 3619	12X	20 3620	L _c		L		Ø D _s	
	Solid carbide milling cutter									
	mm	TiAlN	TiAlN		20 3619 mm	20 3620 mm	20 3619 mm	20 3620 mm	mm	mm
4		eShop		eShop	16	18	62	65	6	0.032
5		eShop		eShop	18	22	62	70	6	0.032
6		eShop		eShop	18	26	62	70	6	0.054
8		eShop		eShop	24	36	68	90	8	0.063
10		eShop		eShop	30	46	80	100	10	0.072
12		eShop		eShop	36	56	93	110	12	0.08
16		eShop		eShop	48	66	108	130	16	0.089
20		eShop		eShop	60	76	126	140	20	0.107
25		—		eShop	—	92	—	180	25	0.107



GARANT Diabolo solid carbide milling cutter HRC 62 / GARANT Diabolo solid carbide milling cutter HPC

GARANT Diabolo:

Special geometry, coating and carbide, specially for hard machining.

20 3221/3211 – Dimensions similar to DIN 6527.

20 3221 – **Specialist for steels up to 62 HRC.** Reliable process and longer service life thanks to optimised cutter geometry and state-of-the-art high-performance coating.

Application: For peripheral milling as a **finishing operation.** (plunge cutting only to shallow depths).



20 3221



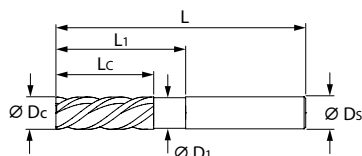
20 3211



20 3282

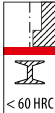


20 3372



20 3382

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
20 3211/3282									170	170	170	145	100										
20 3221									170	150	130	100	80	65									
20 3372/3382									120	115	100	90	60										

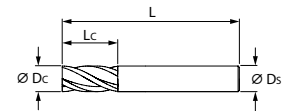
Ø D _c	11Z	20 3221	11X	20 3211	11X	20 3282	No. of teeth Z	L _c		L		Ø D _s		
	GARANT Diabolo solid carbide milling cutter HRC 62			GARANT Diabolo solid carbide milling cutter				20 3221 20 3211	20 3282	20 3221 20 3211	20 3282		f _z	f _z
	HPC			20 3221 20 3211	20 3282	20 3221 20 3211		20 3282	20 3221 20 3211	20 3282	f _z		f _z	
	mm	TiSiN	TiAlN	TiAlN	mm	mm		mm	mm	mm	mm		mm	mm
2	eShop	eShop	—	4	8	—	57	—	6	0.015	0.016			
3	eShop	eShop	—	4	12	—	57	—	6	0.02	0.016			
4	eShop	eShop	—	6	13	—	57	—	6	0.025	0.016			
5	eShop	eShop	—	6	15	—	57	—	6	0.03	0.016			
6	eShop	eShop	eShop	6	16	18	57	65	6	0.035	0.016			
8	eShop	eShop	eShop	6	19	24	63	70	8	0.04	0.02			
10	eShop	eShop	eShop	6	25	30	72	85	10	0.045	0.02			
12	eShop	eShop	eShop 	6	28	36	83	93	12	0.05	0.025			
14	eShop	eShop	eShop	6	30	42	83	100	14	0.05	0.025			
16	eShop	eShop	eShop	8	36	48	92	110	16	0.06	0.025			
18	eShop	eShop	eShop	8	36	54	92	114	18	0.065	0.03			
20	eShop	eShop	eShop	10	41	60	104	126	20	0.07	0.03			

Ø e8 D _c	11X	20 3372	11X	20 3382	No. of teeth Z	L _c		L ₁	Ø D ₁	L		Ø D _s	
	GARANT Diabolo solid carbide milling cutter												
	HPC					20 3372	20 3382	20 3382	20 3382	20 3372	20 3382		
	mm	TiAlN	TiAlN			mm	mm	mm	mm	mm	mm	mm	
6	—	eShop	6	—	16	40	5.8	—	80	6	0.014		
8	—	eShop	6	—	19	50	7.7	—	100	8	0.016		
10	—	eShop	6	—	25	60	9.7	—	100	10	0.018		
12	eShop	eShop	6	45	30	60	11.6	100	120	12	0.021		
16	eShop	eShop	8	65	40	100	15.6	125	150	16	0.025		
20	eShop	eShop	10	75	50	100	19.6	135	150	20	0.03		
25	eShop	—	10	75	—	—	—	150	—	25	0.036		



0
-0.01

0
-0.02



HOLEX Solid carbide milling cutter

Strengthened core and geometry for hard machining, without dynamic helical pitch.

20 3246 Size 5 – Tolerance: Size nominal $\varnothing D_c$ 0/-0.01 mm.

Size 6–20 – Tolerance: Size nominal $\varnothing D_c$ 0/-0.02 mm.

Application: For profile milling as finishing.
(Plunge cutting only to shallow depths).

Note:

20 3246 – Successor product to No. 203240.

20 3248 – Successor product to No. 203320.



20 3246



20 3248

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
20 3246/3248							160	95	85	75	65	50	30										

$\varnothing D_c$	12X	20 3246	12X	20 3248	L_c		L		$\varnothing D_s$	Corner chamfer width at 45°	
		Solid carbide milling cutter			20 3246	20 3248	20 3246	20 3248			
mm		TiAlN	TiAlN		mm	mm	mm	mm	mm	mm	mm
5		eShop	–		13	–	57	–	6	0.05	0.016
6		eShop	eShop		13	18	57	62	6	0.06	0.023
8		eShop	eShop		19	24	63	68	8	0.08	0.03
10		eShop	eShop		22	30	72	80	10	0.1	0.038
12		eShop	eShop		26	36	83	93	12	0.12	0.045
14		eShop	eShop		26	42	83	99	14	0.14	0.045
16		eShop	eShop		32	48	92	108	16	0.16	0.05
20		eShop	eShop		38	60	104	126	20	0.2	0.055



0
-0.02

0
-0.03

4

6

GARANT Solid carbide milling cutter HPC

GARANT Diabolo 70:

Special solid carbide substrate with extremely high tensile strength combined with outstanding wear resistance for optimum process reliability. Newly developed nano-crystalline high-tech coating for hard milling up to 70 HRC. Very suitable for continuous use in tool and mould making.

Sizes 2 – 5: Recess angle $\alpha = 15^\circ$.

Tolerance:

■ Size nominal $\varnothing D_c \leq$ size 12: 0 / -0.02 mm;

■ Size nominal $\varnothing D_c$ from size 16: 0 / -0.03 mm.

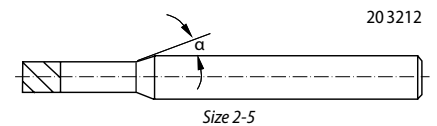
Application: Due to the special hard geometry ideal for use on hardened materials from 60 HRC to 70 HRC.

For profile milling as finishing.
(Plunge cutting only to shallow depths.)

Note: For materials > 65 HRC: $a_e = 0.02 \times D$.



20 3212



Size 2-5

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
20 3212										145	100	80	75										

$\varnothing D_c$	11X	20 3212	No. of teeth Z	L_c	L	$\varnothing D_s$	
		Solid carbide milling cutter					
		HPC TiAlN					
mm				mm	mm	mm	mm
2		eShop	4	6	58	6	0.018
3		eShop	6	8	58	6	0.018
4		eShop	6	11	58	6	0.018
5		eShop	6	13	58	6	0.018
6		eShop	6	13	58	6	0.02
8		eShop	6	19	64	8	0.025
10		eShop	6	22	73	10	0.025
12		eShop	6	26	74	12	0.035
16		eShop	6	32	93	16	0.04

20



Garant GARANT Master Steel solid carbide finishing cutter HPC

For **finishing operations**.

Special geometry for optimum chip evacuation.

Unequal spacing gives high **intrinsic stability and smooth cutting action**.

For **profile milling as a finishing operation**.

20 4012–4016 – Suitable for machining titanium and titanium alloys.

20 4016–4019 – Particularly long cutting edges for efficient finishing.

Note: Can be reground from $\varnothing D_c = 6$ mm.

20 4012–4015 – $a_{e\max} = 0.1 \times D$

20 4016–4019 – $a_{e\max} = 0.05 \times D$



20 4012



20 4014



20 4015



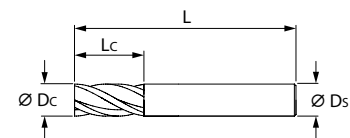
20 4016



20 4018



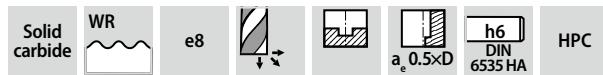
20 4019



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
20 4012–20 4015				360	340	300	290	200						130	120	100	300						
20 4016				240	220	200	180	150						90	80	100	200						
20 4018/4019				240	220	200	180	150						90	80	80	200						

$\varnothing f_8 D_c$	20 4012	20 4014	20 4015	L_c	L	$\varnothing D_s$	Corner chamfer width at 45°	f_z
	GARANT Master Steel solid carbide finishing cutter							
	HPC			20 4012	20 4014 20 4015	20 4012	20 4014 20 4015	20 4012 20 4014
mm	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm
4	eShop	eShop	eShop	11	16	57	62	6
5	eShop	eShop	eShop	13	17	57	62	6
6	eShop	eShop	eShop	13	18	57	62	6
8	eShop	eShop	eShop	19	24	63	68	8
10	eShop	eShop	eShop	22	30	72	80	10
12	eShop	eShop	eShop	26	36	83	93	12
14	eShop	eShop	eShop	26	42	83	99	14
16	eShop	eShop	eShop	32	48	92	108	16
20	eShop	eShop	eShop	41	60	104	126	20

$\varnothing f_8 D_c$	20 4016	20 4018	20 4019	L_c	L	$\varnothing D_s$	Corner chamfer width at 45°	f_z
	GARANT Master Steel solid carbide finishing cutter							
	HPC			20 4016	20 4018 20 4019	20 4016	20 4018 20 4019	20 4016 20 4018
mm	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm
6	eShop	–	–	24	–	66	–	6
8	eShop	eShop	eShop	32	40	74	81	8
10	eShop	eShop	eShop	40	50	89	96	10
12	eShop	eShop	eShop	48	60	100	112	12
14	eShop	eShop	eShop	56	70	108	122	14
16	eShop	eShop	eShop	64	80	123	136	16
20	eShop	eShop	eShop	80	100	140	160	20



GARANT Master Alu SlotMachine solid carbide roughing end mill HPC / solid carbide roughing end mill HPC

20 5255 – Improved chip evacuation due to central through-coolant.

20 5265 – For roughing. Special profile for machining non-ferrous metals.

20 5250–5260/5270 – For roughing.

Special profile for machining non-ferrous metals.

Advantage:

20 5250/5255/5265 – **Optimised flute form, eccentric relief ground, generous chip spaces.**

Up to $2 \times D$ into solid material at very high feed rates and smooth cutting action.

Ramping capability up to 45° .

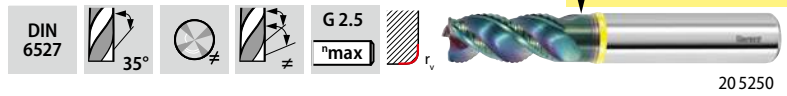
Very high feed rates when plunging vertically, thanks to **special plunging geometry**.

Note:

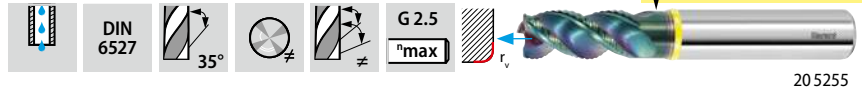
20 5250 – For **HB shanks** use order no. **205251**.

20 5255 – For **HB shanks** use order no. **205256**.

20 5265 – For **HB shanks** use order no. **205266**.



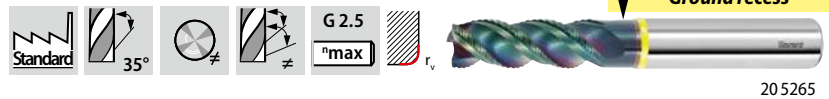
20 5250



20 5255



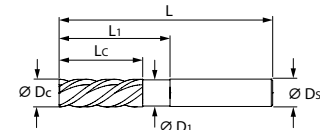
20 5260



20 5265



20 5270



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 5250/5265	450	400	380			120	100										160	200					
20 5255	450	400	380			120	100										160	200					
20 5260/5270	300	280	200			120	100										80	100					

$\varnothing e8$ D_c	11X	20 5250	11X	20 5255	12X	20 5260	No. of teeth Z	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner rounding r_v		
		Garant		Garant		HOLEX									
		GARANT Master Alu SlotMachine solid carbide roughing end mill		GARANT Master Alu SlotMachine solid carbide roughing end mill with through-coolant		Solid carbide roughing end mill									
							20 5250 20 5255	20 5260							
mm		DLC		DLC					mm	mm	mm	mm	mm	mm	mm
4		eShop		eShop		eShop	3	3	8	—	57	6	0.1	0.04	0.06
5		eShop		eShop		eShop	3	3	9	—	57	6	0.2	0.06	0.08
6		eShop		eShop		eShop	3	3	13	19	5.5	6	0.2	0.08	0.1
8		eShop		eShop		eShop	3	3	19	25	7.5	63	8	0.2	0.1
10		eShop		eShop		eShop	3	3	22	30	9.5	72	10	0.32	0.12
12		eShop		eShop		eShop	3	3	26	36	11	83	12	0.32	0.15
14		eShop		eShop		eShop	4	3	26	36	13	83	14	0.32	0.18
16		eShop		eShop		eShop	4	3	31	42	15	92	16	0.32	0.2
18		eShop		eShop		eShop	4	3	31	42	17	92	18	0.32	0.22
20		eShop		eShop		eShop	4	3	41	52	19	104	20	0.5	0.25

$\varnothing e8$ D_c	11X	20 5265	12X	20 5270	No. of teeth Z	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner rounding r_v		
		Garant		HOLEX									
		GARANT Master Alu SlotMachine solid carbide roughing end mill		Solid carbide roughing end mill									
					20 5265	20 5270							
mm		DLC					mm	mm	mm	mm	mm	mm	mm
6		eShop		eShop	3	3	18	24	5.5	62	6	0.2	0.08
8		eShop		eShop	3	3	24	30	7.5	68	8	0.2	0.1
10		eShop		eShop	3	3	30	38	9.5	80	10	0.32	0.12
12		eShop		eShop	3	3	36	46	11	93	12	0.32	0.15
14		eShop		eShop	4	3	42	52	13	99	14	0.32	0.18
16		eShop		eShop	4	3	48	58	15	108	16	0.32	0.2
18		eShop		eShop	4	3	54	67	17	117	18	0.32	0.22
20		eShop		eShop	4	3	60	74	19	126	20	0.5	0.25



GARANT Master Alu SlotMachine solid carbide roughing end mill HPC/TPC, TPC

For roughing.

Special profile for machining non-ferrous metals. Significant reduction in the chip volume due to targeted chip fragmentation using the **special cutter geometry**.

20 5267 – Improved chip evacuation due to central through-coolant.

20 5282 – As a result of the 5 teeth, even higher feed rates are possible. The end face is supported by an additional **stabilising chamfer**, which leads to **smoother operation during helical plunging**.

20 5274/5275 – **Problem-solver for TPC machining**. Ideal for automated production as the risk of chip accumulations in the machine is largely prevented.

Note:

HB shanks are available at the same price as HA.

20 5267 – For **HB shanks** use order no. **205268**.

20 5274 – For **HB shanks** use order no. **205276**.

$h_{\max}$: The values stated in the table are maximum values.

$a_{e\max}$ is $0.15 \times D$ for TPC machining.

20 5275 – For **HB shanks** use order no. **205277**.

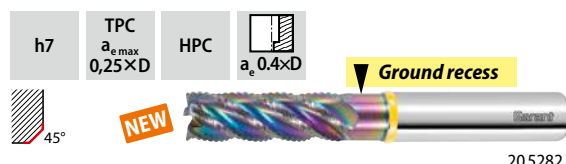
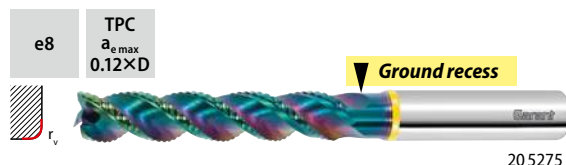
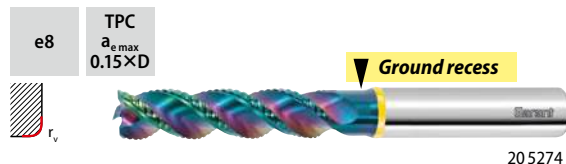
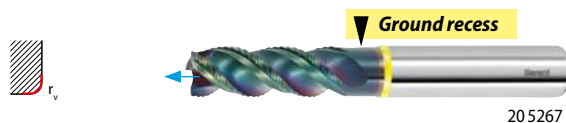
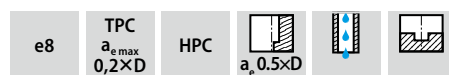
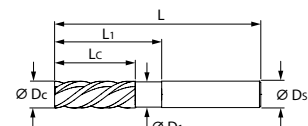
$h_{\max}$: The values stated in the table are maximum values.

$a_{e\max}$ is $0.12 \times D$ for TPC machining.

20 5282 – For **HB shanks**: use order **No. 205283**.

20 5267/5282 – $h_{\max}$: The values stated in the table are maximum values.

$a_{e\max}$ is $0.2 \times D$ for TPC machining.



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 5267	450	400	380			120	100										160	200					
20 5274	400	360	340			110	90										140	180					
20 5275	360	320	300			100	80										130	160					
20 5282	500	480	450			120	100										160	200					

$\varnothing e8$ D_c	1TX	20 5267	No. of teeth Z	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner rounding r_v		
		GARANT Master Alu SlotMachine solid carbide roughing end mill with through-coolant								f_z	f_z
mm		HPC / TPC DLC		mm	mm	mm	mm	mm	mm	mm	mm
6		eShop	3	18	24	5.5	62	6	0.2	0.08	0.1
8		eShop	3	24	30	7.5	68	8	0.2	0.1	0.12
10		eShop	3	30	38	9.5	80	10	0.32	0.12	0.14
12		eShop	3	36	46	11	93	12	0.32	0.15	0.18
16		eShop	4	48	58	15	108	16	0.32	0.2	0.22
20		eShop	4	60	74	19	126	20	0.5	0.25	0.28

Ø e8 D _c	1TX 20 5274		1TX 20 5275		No. of teeth Z	L _c		L ₁		Ø D ₁		L		Ø D _s		Corner rounding r _v	 Alu  h _{max}
	GARANT Master Alu SlotMachine solid carbide roughing end mill																
	TPC					20 5274	20 5275	20 5274	20 5275		20 5274	20 5275					
mm	DLC		DLC			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
6	eShop		eShop		3	25	31	30	36	5.7	70	75	6	0.2	0.043	0.039	
8	eShop		eShop		3	33	41	40	48	7.5	80	90	8	0.2	0.057	0.052	
10	eShop		eShop		3	41	51	50	60	9.5	90	104	10	0.32	0.071	0.065	
12	eShop		eShop		3	49	61	60	72	11	110	120	12	0.32	0.086	0.078	
16	eShop		eShop		4	65	81	80	96	15	130	150	16	0.32	0.114	0.104	
20	eShop		—		4	82	—	100	—	19	150	—	20	0.5	0.143	—	

$\varnothing h7$ D_c	1TX	20 5282	No. of teeth Z	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner chamfer width at 45°	
		GARANT Master Alu SlotMachine solid carbide roughing end mill								f_z
		HPC / TPC DLC		mm	mm	mm	mm	mm	mm	mm
6		eShop	5	20	24	5.5	65	6	0.2	0.08
8		eShop	5	26	30	7.5	70	8	0.2	0.1
10		eShop	5	32	38	9.5	80	10	0.32	0.12
12		eShop	5	39	46	11	93	12	0.32	0.15
16		eShop	5	52	58	15	110	16	0.32	0.2
20		eShop	5	64	74	19	125	20	0.5	0.25



Garant Solid carbide roughing end mill

Dimensions similar to DIN 6527.

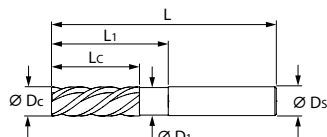
Knuckle form profile.

Special profile for machining non-ferrous metals.

20 5331 – With the latest generation of DLC coating sp².



20 5330



20 5331

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	Cu	CuZn					
ISO code	N	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	N	N			
20 5330		270	250	180														80	100			
20 5331		400	320	260														150	180			

Ø d11 D _c	11X	20 5330	11X	20 5331	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	f _z	f _z
mm					mm	mm	mm	mm	mm	mm	mm	mm
4		eShop		eShop	11	20	3.8	57	6	0.35	0.035	0.045
5		eShop		eShop	13	20.5	4.8	57	6	0.35	0.035	0.045
6		eShop		eShop	13	21	5.8	57	6	0.35	0.06	0.08
8		eShop		eShop	16	27	7.8	63	8	0.45	0.06	0.08
10		eShop		eShop	22	32	9.8	72	10	0.55	0.07	0.09
12		eShop		eShop	26	38	11.8	83	12	0.65	0.07	0.09
16		eShop		eShop	32	44	15.8	92	16	0.85	0.09	0.11
20		eShop		eShop	38	54	19.8	104	20	1.05	0.12	0.14



Garant Solid carbide roughing end mill with internal coolant supply

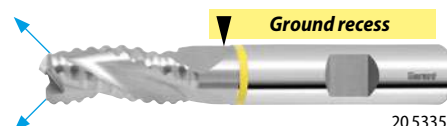
Dimensions similar to DIN 6527.

Knuckle form profile.

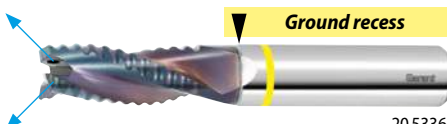
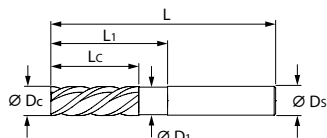
Special profile for machining non-ferrous metals.

With through-coolant.

20 5336 – With the latest generation of DLC coating sp².



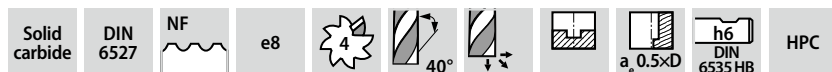
20 5335



20 5336

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	Cu	CuZn					
ISO code	N	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	N	N			
20 5335		270	250	180													80	100			
20 5336		400	320	260													150	180			

Ø d11 D _c	11X	20 5335	11X	20 5336	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	f _z	f _z
mm					mm	mm	mm	mm	mm	mm	mm	mm
6		eShop		eShop	13	21	5.8	57	6	0.35	0.06	0.08
8		eShop		eShop	16	27	7.8	63	8	0.45	0.06	0.08
10		eShop		eShop	22	32	9.8	72	10	0.55	0.07	0.09
12		eShop		eShop	26	38	11.8	83	12	0.65	0.07	0.09
16		eShop		eShop	32	44	15.8	92	16	0.85	0.09	0.11
20		eShop		eShop	38	54	19.8	104	20	1.05	0.12	0.14



Garant GARANT INOX SlotMachine solid carbide roughing end mill HPC

With modified knuckle form profile, optimised flutes and state-of-the-art high-performance coating. Exceptionally well suited for roughing machining work on stainless steel materials.

Dimensions similar to DIN 6527.

Advantage: The tool geometry produces particularly tightly rolled swarf that is discharged via flat chip breaker recesses. As a result, the tool maintains an **extremely stable core**.

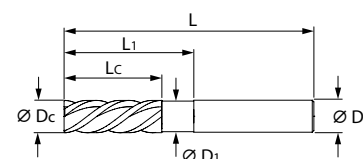
Recommendation: To ensure reliable working, particularly for full slot milling, use arbors with **4 cooling channel bores**.



20 5447



20 5449



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	INOX < 500 N	INOX < 750 N	INOX < 900 N	INOX < 1100 N	INOX < 1400 N	INOX < 55 HRC	INOX < 60 HRC	INOX < 65 HRC	INOX < 67 HRC	INOX < 70 HRC	TOOLOX 33 HRC	TOOLOX 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M	S					
20 5447/5449				170	150	130	120	110						105	70	90	80						

Ø e8 D _c	11Z	20 5447	11Z	20 5449	L _c		L ₁		Ø D ₁	L		Ø D _s	Corner chamfer width at 45°		
	GARANT INOX SlotMachine solid carbide roughing end mill													INOX	INOX
	HPC				20 5447	20 5449	20 5447	20 5449		20 5447	20 5449			> 900 N	> 900 N
	mm	AITiN		AITiN		mm	mm	mm	mm	mm	mm	mm	mm	mm	f _z
4	eShop		eShop		8	11	–	17	3.8	54	57	6	0.15	0.015	0.023
5	eShop		eShop		9	13	–	19	4.8	54	57	6	0.15	0.02	0.03
6	eShop		eShop		10	13	16	19	5.8	54	57	6	0.15	0.025	0.035
8	eShop		eShop		12	21	20	25	7.7	58	63	8	0.2	0.04	0.05
10	eShop		eShop		14	22	24	30	9.7	66	72	10	0.2	0.045	0.06
12	eShop		eShop		16	26	26	36	11.6	73	83	12	0.25	0.05	0.065
16	eShop		eShop		22	36	32	42	15.5	82	92	16	0.35	0.055	0.075
20	eShop		eShop		26	41	40	52	19.5	92	104	20	0.4	0.075	0.095

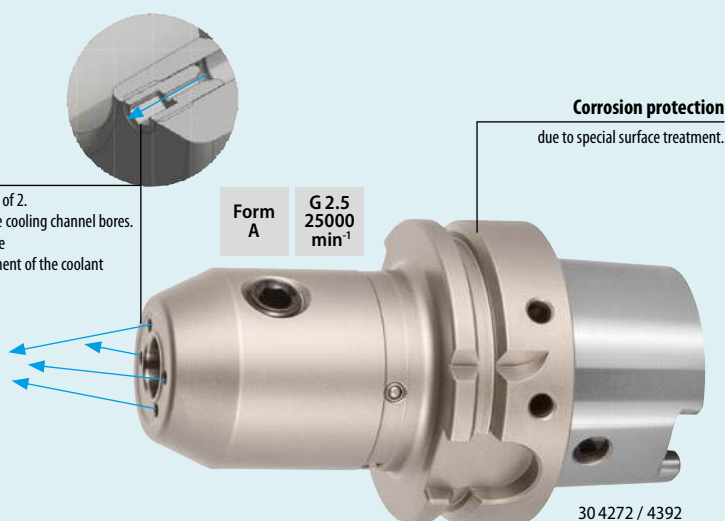
Suitable toolholders can be found in the clamping technology section

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Optimised cooling concept

- 4 cooling channel bores instead of 2.
- Different approach angles of the cooling channel bores.
- With 4 nozzle screws to optimise the coolant pressure and alignment of the coolant stream.



304272 / 4392



Solid carbide roughing end mill HPC

Dimensions similar to DIN 6527.

For high feed rates, very high metal removal rate.

20 5486 – With 20° helix.

20 5492 – Without dynamic twist pitch.

Size **16M MID mills: Dimensions to manufacturer's standard.**

20 5482/5490 – **With special knuckle profile.**

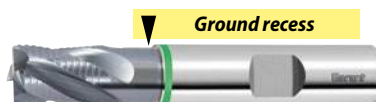
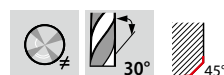
Note:

20 5482 – **NEW GENERATION AVAILABLE!**
Recommended successor product No. 205548.

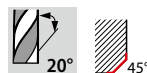
20 5486 – **NEW GENERATION AVAILABLE!**
Recommended successor product No. 205704.

20 5490 – **NEW GENERATION AVAILABLE!**
Recommended successor product No. 205550.

20 5492 – **NEW GENERATION AVAILABLE!**
Recommended successor product No. 205706.



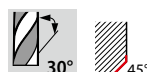
20 5482



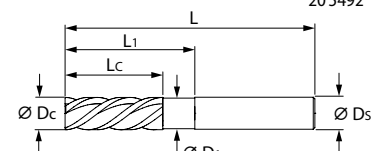
20 5486



20 5490



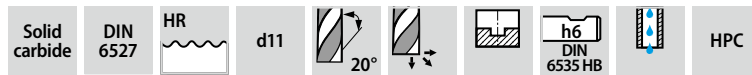
20 5492



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 5482/5490		280	200	120	105	100	70	60	35					60	50		90						
20 5486/5492		270	190	115	100	95	65	55						55			85						

Ø d11 D _c	11X	20 5482 Garant	12X	20 5486 HOLEX	No. of teeth Z	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	f _z	f _z
		Solid carbide roughing end mill, short											
		HPC											
mm		TiAlN	TiAlN			mm	mm	mm	mm	mm	mm	mm	mm
5	eShop	eShop		3	3	8	10	—	54	6	0.3	0.4	0.023
6	eShop	eShop		3	4	8	10	18	5.5	54	6	0.3	0.033
7	eShop	—		3	—	11	—	—	58	8	0.3	—	0.033
8	eShop	eShop		3	4	11	12	22	7.5	58	8	0.3	0.045
9	eShop	—		4	—	13	—	—	66	10	0.5	—	0.045
10	eShop	eShop		4	4	13	14	26	9.5	66	10	0.5	0.05
12	eShop	eShop		4	4	16	16	28	11	73	12	0.5	0.06
14	eShop	—		4	—	16	—	31	13	76	14	0.5	0.08
16	eShop	eShop		4	4	19	22	34	15	82	16	0.5	0.1
18	eShop	—		4	—	19	—	36	17	84	18	0.5	0.1
20	eShop	eShop		4	4	20	26	42	19	92	20	0.5	0.12

Ø d11 D _c	11X	20 5490 Garant	12X	20 5492 HOLEX	No. of teeth Z	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	f _z	f _z
		Solid carbide roughing end mill											
		HPC											
mm		TiAlN	TiAlN			mm	mm	mm	mm	mm	mm	mm	mm
4	eShop	eShop		3	3	8	—	—	57	6	0.3	0.02	0.023
5	eShop	eShop		3	3	13	—	—	57	6	0.3	0.02	0.023
6	eShop	eShop		3	4	13	21	5.5	57	6	0.3	0.03	0.033
7	eShop	—		3	—	16	—	—	63	8	0.3	0.03	0.033
8	eShop	eShop		3	4	16	26	7.5	63	8	0.3	0.04	0.045
9	eShop	—		4	—	19	—	—	72	10	0.5	0.04	0.045
10	eShop	eShop		4	4	22	32	9.5	72	10	0.5	0.05	0.06
11	eShop	—		4	—	26	—	—	83	12	0.5	0.05	0.06
12	eShop	eShop		4	4	26	38	11	83	12	0.5	0.06	0.08
13	eShop	—		4	—	26	—	—	83	14	0.5	0.06	0.08
14	eShop	eShop		4	4	26	38	13	83	14	0.5	0.06	0.08
16	eShop	eShop		4	4	32	44	15	92	16	0.5	0.08	0.1
16M	—	eShop		—	4	48	—	—	110	16	0.5	0.08	0.1
18	eShop	—		4	—	32	44	17	92	18	0.5	0.08	0.1
20	eShop	eShop		4	4	38	54	19	104	20	0.5	0.1	0.12
25	eShop	eShop		5	5	45	65	24	121	25	0.5	0.12	0.14



Garant Solid carbide roughing end mill HPC with internal coolant supply

With internal coolant supply.

The coolant is fed directly to the cutting edges.

This gives **longer tool-life** and **complete swarf evacuation**.

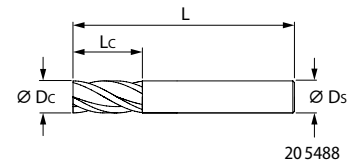
This is especially **important when milling slots or pockets**.



20 5488



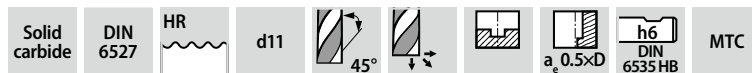
20 5592



20 5488

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si 	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K							
20 5488/5592		280	200	120	105	100	70	60	35					60	50		90							

Ø d11 D _c	20 5488		20 5592		No. of teeth Z	L _c		L		Ø D _s	Corner cham- fer width at 45°	 f _z < 900 N	 f _z < 900 N
	Solid carbide roughing end mill with internal coolant supply												
	HPC		HPC			20 5488	20 5592	20 5488	20 5592				
mm	TiAlN	TiAlN	TiAlN	TiAlN		mm	mm	mm	mm	mm	mm	mm	mm
8	eShop	eShop	eShop	eShop	3	11	16	58	63	8	0.3	0.04	0.045
10	eShop	eShop	eShop	eShop	4	13	22	66	72	10	0.5	0.05	0.06
12	eShop	eShop	eShop	eShop	4	16	26	73	83	12	0.5	0.06	0.08
16	eShop	eShop	eShop	eShop	4	19	32	82	92	16	0.5	0.08	0.1
20	eShop	eShop	eShop	eShop	4	20	38	92	104	20	0.5	0.1	0.12



Garant Solid carbide roughing end mill MTC

Dimensions similar to DIN 6527.

Optimised special knuckle profile for roughing.

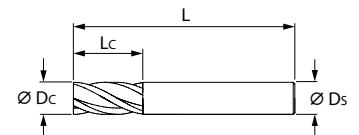
Very **high rate of metal removal**.

Can be used as a **universal end mill**.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

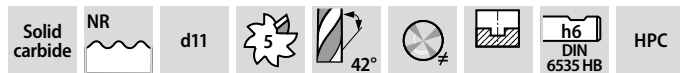


20 5710



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 5710					170	170	140	120						60	50	40	120	●	●	○	○	○	

Ø d11 D _c	11X	20 5710	No. of teeth Z	L _c	L	Ø D _s	Corner chamfer width at 45°	 < 900 N f _z	 < 900 N f _z
		Solid carbide roughing end mill							
mm		MTC TiAlN		mm	mm	mm	mm	mm	mm
6		eShop	4	8	54	6	0.15	0.028	0.03
8		eShop	4	11	58	8	0.2	0.04	0.05
10		eShop	4	13	66	10	0.2	0.05	0.06
12		eShop	4	16	73	12	0.25	0.06	0.07
14		eShop	4	16	75	14	0.3	0.08	0.09
16		eShop	5	19	83	16	0.35	0.08	0.09
18		eShop	5	19	80	18	0.35	0.1	0.12
20		eShop	5	20	93	20	0.4	0.1	0.12



GARANT Master Steel SlotMachine solid carbide roughing end mill HPC

With a new-type knurled profile, optimised for higher feed rates. Improved cutting edge protection thanks to slight edge honing. Tremendous bending strength due to the use of ultra-fine grain substrate.

20 5551 – With **internal coolant supply** for reliable swarf evacuation.

20 5548–5551 – Feed rate per tooth up to 0.1 mm up to a depth of 2xD (in the slot milled from solid).

Advantage: The tool geometry produces particularly tightly rolled swarf that is discharged via flat chip breaker recesses. As a result, the tool maintains an extremely stable core. Plunge angle of up to 10° possible thanks to generous recess on the front face.

Application: For roughing machining, particularly suitable for full-slot machining.



20 5548



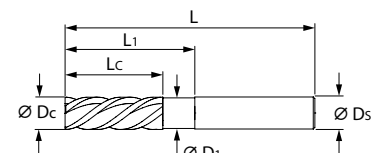
20 5550



20 5551



20 5552



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 10 % Si											INOX	INOX	Ti	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 5548/5550				200	180	160	140	110						50	35		200	●	●	○	●	●	
20 5551/5552				200	180	160	140	110						50	35		200	●	●	○	●	●	

Ø d11 D _c	11X	20 5548	L _c	L	Ø D ₁	Corner chamfer width at 45°	f _z	f _z
		GARANT Master Steel SlotMachine solid carbide roughing end mill						
		HPC						
		TiAlN						
mm			mm	mm	mm	mm	mm	mm
4		eShop	8	54	6	0.2	0.03	0.04
5		eShop	9	54	6	0.25	0.03	0.04
6		eShop	10	54	6	0.3	0.04	0.05
7		eShop	11	58	8	0.35	0.05	0.06
8		eShop	12	58	8	0.4	0.05	0.06
9		eShop	13	66	10	0.45	0.06	0.08
10		eShop	14	66	10	0.5	0.06	0.08
12		eShop	16	73	12	0.6	0.07	0.09
14		eShop	18	75	14	0.7	0.08	0.1
16		eShop	22	82	16	0.8	0.1	0.12
20		eShop	26	92	20	1	0.12	0.14

Ø d11 D _c	11X 20 5550	11X 20 5551	11X 20 5552	L _c		L ₁		Ø D ₁	L		Ø D ₃	Corner chamfer width at 45°	 f _z	 f _z
	GARANT Master Steel SlotMachine solid carbide roughing end mill	GARANT Master Steel SlotMachine solid carbide roughing end mill with through-coolant	GARANT Master Steel SlotMachine solid carbide roughing end mill											
	HPC			20 5550	20 5552	20 5550	20 5552		20 5550	20 5552				
mm	TiAlN	TiAlN	TiAlN	20 5551	mm	20 5551	mm	mm	20 5551	mm	mm	mm	mm	mm
4	eShop	eShop	—	11	—	19	—	3.7	57	—	6	0.2	0.02	0.03
5	eShop	eShop	eShop	13	13	19	24	4.6	57	62	6	0.25	0.02	0.03
6	eShop	eShop	eShop	13	13	19	25	5.6	57	62	6	0.3	0.035	0.045
7	eShop	—	—	16	—	25	—	6.5	63	—	8	0.35	0.035	0.045
8	eShop	eShop	eShop	19	21	25	30	7.4	63	68	8	0.4	0.045	0.06
9	eShop	—	—	19	—	30	—	8.3	72	—	10	0.45	0.045	0.06
10	eShop	eShop	eShop	22	22	30	38	9.3	72	80	10	0.5	0.065	0.09
12	eShop	eShop	eShop	26	26	36	46	11.1	83	93	12	0.6	0.065	0.09
14	eShop	—	eShop	26	26	36	52	13	83	99	14	0.7	0.07	0.1
16	eShop	eShop	eShop	32	36	42	58	14.8	92	108	16	0.8	0.07	0.1
20	eShop	eShop	eShop	38	41	52	74	18.5	104	126	20	1	0.09	0.13



Garant GARANT Master Steel SlotMachine solid carbide roughing end mill HPC / TPC, solid carbide roughing end mill HPC

With a new-type knurled profile, optimised for higher feed rates. Improved cutting edge protection thanks to slight edge honing. Tremendous bending strength due to the use of ultra-fine grain substrate.

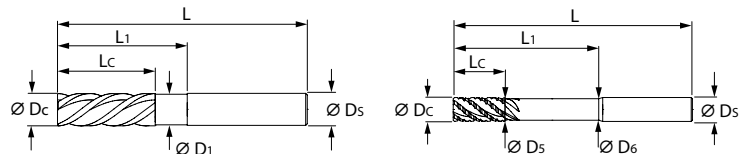
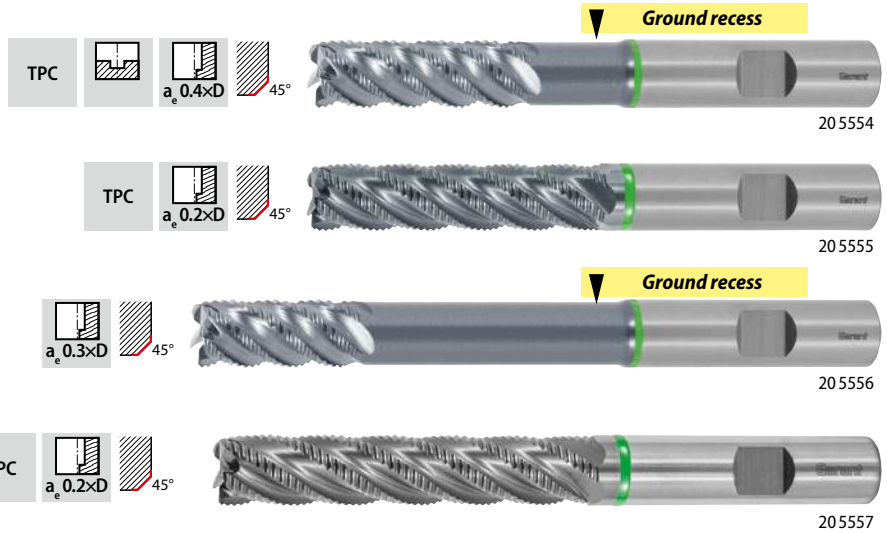
Advantage: The tool geometry produces particularly tightly rolled swarf that is discharged via flat chip breaker recesses. As a result, the tool maintains an extremely stable core.

Application: For roughing machining.

20 5554/5555/5557 – **Problem-solver for TPC machining.**

Note:

20 5556 – Particularly long neck recess for avoiding interference contours. With conically increasing recess to guarantee stability at long overhangs.



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si 											INOX 	INOX 	Ti 	GG(G) 	Uni 						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K							
20 5554				200	180	160	140	110						50	35		200	●		●	○	●	●	●
20 5555/5556				180	170	150	130	100						45	30		180	●		●	○	●	●	●
20 5557				160	150	130	110	80						40	25		160	●		●	○	●	●	●

Ø d11 D _c	11X	20 5554	11X	20 5555	L _c	L ₁	Ø D ₁	L	Ø D ₅	Corner chamfer width at 45°		
		GARANT Master Steel SlotMachine solid carbide roughing end mill										
		HPC / TPC		20 5554	20 5555	20 5554	20 5554	20 5554	20 5555			
mm		TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm
5		eShop	—	17	—	24	4.6	62	—	6	0.25	0.02
6		eShop	eShop	18	24	25	5.6	62	66	6	0.3	0.03
8		eShop	eShop	24	32	30	7.4	68	74	8	0.4	0.04
10		eShop	eShop	30	40	35	9.3	80	89	10	0.5	0.05
12		eShop	eShop	36	48	45	11.1	93	100	12	0.6	0.06
14		eShop	—	42	—	50	13	99	—	14	0.7	0.07
16		eShop	eShop	48	64	55	14.8	108	123	16	0.8	0.07
20		eShop	eShop	60	80	70	18.5	126	140	20	1	0.08

Ø d11 D _c	11X	20 5556	11X	20 5557	L _c	L ₁	Ø D ₅	Ø D ₆	L	Ø D ₅	Corner chamfer width at 45°	
		GARANT Master Steel SlotMachine solid carbide roughing end mill										
		HPC	HPC / TPC	20 5556	20 5557	20 5556	20 5556	20 5556	20 5556	20 5557		
mm		TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm
6		eShop	—	13	—	42	5.4	5.8	80	—	6	0.04
8		eShop	eShop	21	40	62	7.2	7.8	100	81	8	0.05
10		eShop	eShop	22	50	58	9	9.7	100	96	10	0.06
12		eShop	eShop	26	60	73	10.8	11.6	120	112	12	0.08
16		eShop	eShop	36	80	100	14.4	15.5	150	136	16	0.09
20		eShop	—	41	—	98	18	19.4	150	—	20	0.09



Garant Solid carbide roughing end mill MTC

Dimensions similar to DIN 6527.

Optimised special knuckle profile for roughing.

Very **high rate of metal removal.**

20 5711 – With **semi-roughing knuckle profile** and 45° flutes for superalloys.

20 5712 – With **special internal tooth profile** and 50° flutes for reliable chip breaking in **stainless steels.**

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

Note:

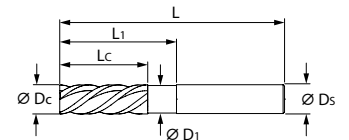
20 5711 – f_z for $a_p \max = 0.5 \times D$.



20 5712

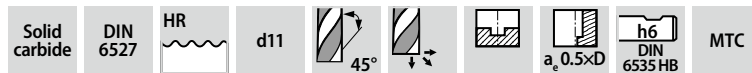


20 5711



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
20 5711				120	105	100	70									50	90						
20 5712				180	170	170	140							100	80								

$\varnothing d_{11}$ D_c	20 5712	20 5711	No. of teeth Z	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner chamfer width at 45°	20 5712	20 5711	20 5712	20 5711	20 5712	20 5711
	Solid carbide roughing end mill														
	MTC														
mm	TiAlN	TiAlN		mm	mm	mm	mm	mm		mm	mm	mm	mm	mm	mm
6	eShop	eShop	4	12	21	5.5	58	6	0.15	0.3	0.014	0.015	0.02	0.02	
8	eShop	eShop	4	16	26	7.5	64	8	0.2	0.3	0.022	0.02	0.03	0.025	
10	eShop	eShop	4	20	32	9.5	73	10	0.2	0.5	0.025	0.025	0.04	0.03	
12	eShop	eShop	4	24	38	11.5	84	12	0.25	0.5	0.03	0.035	0.05	0.04	
16	eShop	eShop	5	32	44	15.5	93	16	0.35	0.5	0.04	0.045	0.06	0.05	
20	eShop	eShop	5	40	54	19.5	104	20	0.4	0.5	0.05	0.055	0.08	0.06	
25	—	eShop	5	50	65	24	125	25	—	0.5	—	0.055	—	0.06	



Garant Solid carbide roughing end mill MTC

20 5714 – Dimensions similar to DIN 6527.

Optimised special knuckle profile for roughing.

Very **high rate of metal removal.**

20 5716 – **Optimised special knuckle profile for roughing.**

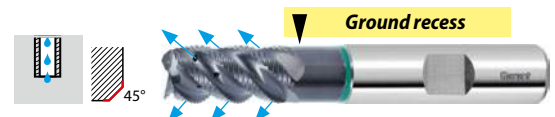
Very **high rate of metal removal.** Can be used as a **universal end mill.**

Special cooling channel system, to achieve the best possible high performance machining.

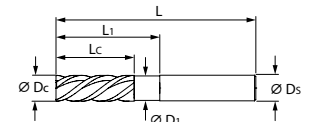
Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.



20 5714



20 5716



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 5714				170	170	140	120							60	45		120						
20 5716				265	195	195	160	140	35					70	50	45	145						

$\varnothing d_{11}$ D_c	20 5714	20 5716	No. of teeth Z	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner chamfer width at 45°	20 5714	20 5716
	Solid carbide roughing end mill										
	MTC										
mm	TiAlN	TiAlN		mm	mm	mm	mm	mm		mm	mm
6	eShop	eShop	4	12	21	5.5	57	6	0.15	0.028	0.03
8	eShop	eShop	4	16	26	7.5	63	8	0.2	0.04	0.05
10	eShop	eShop	4	20	32	9.5	72	10	0.2	0.05	0.06
12	eShop	eShop	4	24	38	11.5	83	12	0.25	0.06	0.07
14	eShop	—	4	28	42	13.5	83	14	0.25	0.06	0.07
16	eShop	eShop	5	32	44	15.5	92	16	0.35	0.08	0.09
18	eShop	—	5	36	44	17.5	92	18	0.35	0.08	0.09
20	eShop	eShop	5	40	54	19.5	104	20	0.4	0.1	0.12
25	eShop	—	5	50	65	24	125	25	0.5	0.1	0.12



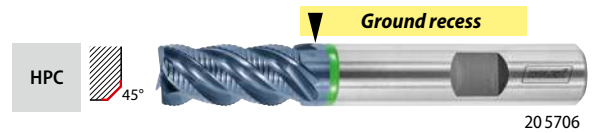
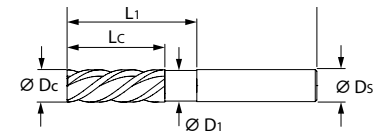
HOLEX Pro Steel solid carbide roughing end mill HPC / solid carbide roughing end mill MTC

Dimensions similar to DIN 6527.

Optimised special knuckle form profile for roughing.

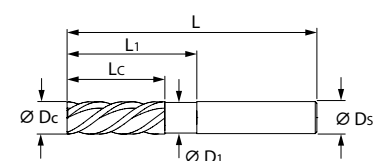
Very high metal removal rate.

Application: For roughing machining, particularly suitable for full-slot machining.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 5704/5706					170	160	135	120						60	45		120	●	●	○	○	○	○
20 5715					155	155	125	110						55	40		110	●	●	○	○	○	○

Ø d11 D _c	12X	20 5704	12X	20 5706	12X	20 5715	No. of teeth Z	L _c		L ₁	Ø D ₁	L		Ø D _s	Corner chamfer width at 45°			
	HOLEX Pro Steel solid carbide roughing end mill							Solid carbide roughing end mill										
	HPC		HPC		MTC			20 5704	20 5706 20 5715	20 5706	20 5706	20 5704	20 5706 20 5715		20 5704 20 5706	20 5715	f _z	f _z
	TiAlN		TiAlN		TiAlN			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
mm	TiAlN		TiAlN		TiAlN			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4	eShop		eShop		—		4	8	11	19	3.7	54	57	6	0.2	—	0.02	0.028
5	eShop		eShop		—		4	9	13	19	4.6	54	57	6	0.25	—	0.02	0.028
6	eShop		eShop		eShop		4	10	13	19	5.6	54	57	6	0.3	0.15	0.028	0.03
8	eShop		eShop		eShop		4	12	19	25	7.4	58	63	8	0.4	0.2	0.04	0.05
10	eShop		eShop		eShop		4	14	22	30	9.3	66	72	10	0.5	0.2	0.05	0.06
12	eShop		eShop		eShop		4	16	26	36	11.1	73	83	12	0.6	0.25	0.06	0.07
16	eShop		eShop		eShop		5	22	32	42	14.8	82	92	16	0.8	0.35	0.08	0.09
20	eShop		eShop		eShop		6	26	38	52	18.5	92	104	20	1	0.4	0.1	0.12
25	—		—		eShop		6	—	50	—	—	—	125	25	—	0.5	0.1	0.12



20

Garant Solid carbide roughing end mill MTC

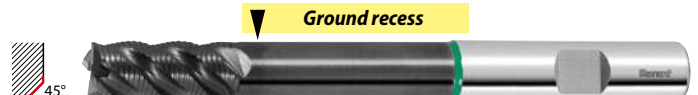
Dimensions similar to DIN 6527.

Optimised special knuckle profile for roughing.

Very high rate of metal removal.

Can be used as a **universal end mill**.

Application: Especially for MTC (Multi Task Cutting) use on the new generation of turning / milling centres.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	K						
20 5718					120	95	85	80	70				70	60	50	35	70	●	●	○	○	○	○

$\varnothing d_{11}$ D_c	11X 20 5718	No. of teeth Z	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Corner chamfer width at 45°	f_z	f_z
	Solid carbide roughing end mill									
	MTC									
mm	TiAlN		mm	mm	mm	mm	mm	mm	mm	mm
6	eShop	4	12	40	5.5	80	6	0.15	0.022	0.024
8	eShop	4	16	50	7.5	100	8	0.2	0.03	0.04
10	eShop	4	20	60	9.5	100	10	0.2	0.04	0.048
12	eShop	4	24	60	11.5	120	12	0.25	0.05	0.056
16	eShop	5	32	100	15.5	150	16	0.35	0.065	0.072
20	eShop	5	40	100	19.5	150	20	0.4	0.08	0.096



Garant Solid carbide micro precision torus cutter

With **advanced DLC sp² coating**. For the **highest demands regarding performance and precision in aluminium materials**. **Extremely tight tolerances** ensure maximum accuracy. Double-relief ground with 2 chamfers hollow ground.

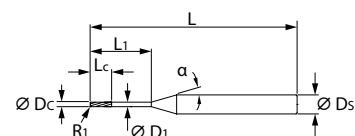
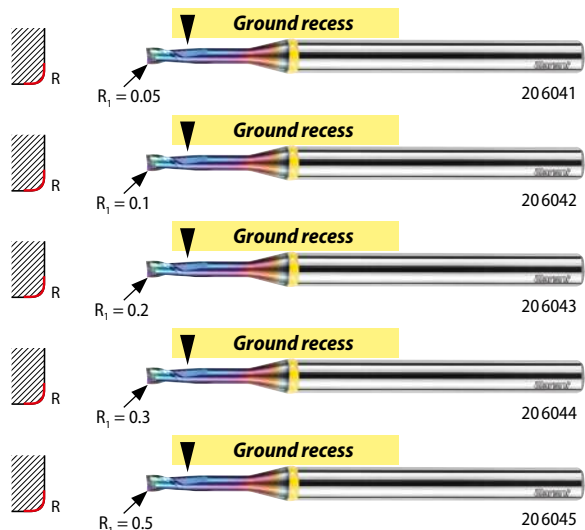
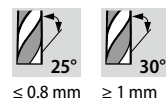
Recess angle $\alpha = 16^\circ$.

Tolerances:

■ Corner radius: $R_1 = \pm 0.0025$ mm.

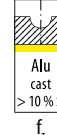
■ Neck $\varnothing$: $D_1 = 0 / -0.01$ mm.

Note: At greater tool overhang lengths, use a reduced value for a_p !
 Values for:
 slots milled from solid: $a_p = 0.25 \times D \times a_{p \text{ korr}}$
 side milling: $a_p = 0.50 \times D \times a_{p \text{ korr}}$
 copying: $a_p = 0.25 \times D \times a_{p \text{ korr}}$
To calculate the feed rate v_f please use the actual speed of the machine (the maximum possible speed)!
 e.g. $v_f = 18000 \text{ [rpm]} \times f_z \text{ [mm/Z]} \times z$



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 6041–20 6045	480	400	400	200	160	200	150	130		180	160	150	130	160			160	200					

$\varnothing D_c \times L_1$	1X 20 6041	1X 20 6042	1X 20 6043	1X 20 6044	1X 20 6045	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_5$	Alu cast > 10 % Si f_z	Alu cast > 10 % Si f_z	Correction factor $a_{p \text{ korr}}$
Solid carbide torus cutter													
mm	R_1 0.05 DLC	R_1 0.1 DLC	R_1 0.2 DLC	R_1 0.3 DLC	R_1 0.5 DLC	mm	mm	mm	mm	mm	mm	mm	
0,2×0,5	eShop	—	—	—	—	0.2	0.5	0.18	50	4	0.012	0.012	1
0,2×1	eShop	—	—	—	—	0.2	1	0.18	50	4	0.012	0.012	1
0,2×2	eShop	—	—	—	—	0.2	2	0.18	50	4	0.007	0.007	0.5
0,2×3	eShop	—	—	—	—	0.2	3	0.18	50	4	0.007	0.007	0.2
0,3×1	eShop	—	—	—	—	0.3	1	0.28	50	4	0.016	0.016	1
0,3×2	eShop	—	—	—	—	0.3	2	0.28	50	4	0.016	0.016	0.9
0,3×3	eShop	—	—	—	—	0.3	3	0.28	50	4	0.012	0.012	0.5
0,3×4	eShop	—	—	—	—	0.3	4	0.28	50	4	0.012	0.012	0.35
0,3×6	eShop	—	—	—	—	0.3	6	0.28	50	4	0.007	0.007	0.08
0,4×1	eShop	eShop	—	—	—	0.4	1	0.38	50	4	0.016	0.016	1
0,4×2	eShop	eShop	—	—	—	0.4	2	0.38	50	4	0.016	0.016	1
0,4×3	eShop	eShop	—	—	—	0.4	3	0.38	50	4	0.016	0.016	0.8
0,4×4	eShop	eShop	—	—	—	0.4	4	0.38	50	4	0.012	0.012	0.5
0,4×6	eShop	eShop	—	—	—	0.4	6	0.38	50	4	0.012	0.012	0.2
0,4×8	eShop	eShop	—	—	—	0.4	8	0.38	50	4	0.007	0.007	0.08
0,5×1	eShop	eShop	—	—	—	0.5	1	0.48	50	4	0.02	0.02	1
0,5×2	eShop	eShop	—	—	—	0.5	2	0.48	50	4	0.02	0.02	1
0,5×3	eShop	eShop	—	—	—	0.5	3	0.48	50	4	0.02	0.02	0.9
0,5×4	eShop	eShop	—	—	—	0.5	4	0.48	50	4	0.02	0.02	0.8
0,5×6	eShop	eShop	—	—	—	0.5	6	0.48	50	4	0.016	0.016	0.35
0,5×8	eShop	eShop	—	—	—	0.5	8	0.48	50	4	0.016	0.016	0.12
0,5×10	eShop	eShop	—	—	—	0.5	10	0.48	50	4	0.012	0.012	0.08
0,6×3	eShop	eShop	—	—	—	0.6	3	0.58	50	4	0.02	0.02	1
0,6×4	eShop	eShop	—	—	—	0.6	4	0.58	50	4	0.02	0.02	0.9
0,6×6	eShop	eShop	—	—	—	0.6	6	0.58	50	4	0.016	0.016	0.5
0,6×8	eShop	eShop	—	—	—	0.6	8	0.58	50	4	0.016	0.016	0.35
0,6×10	eShop	eShop	—	—	—	0.6	10	0.58	50	4	0.016	0.016	0.12
0,8×2	—	eShop	eShop	—	—	0.8	2	0.78	50	4	0.02	0.02	1

$\varnothing D_c \times L_1$	11X 20 6041	11X 20 6042	11X 20 6043	11X 20 6044	11X 20 6045	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_2$			Correction factor $a_{p, corr}$
	Solid carbide torus cutter												
mm	R_1 0.05 DLC	R_1 0.1 DLC	R_1 0.2 DLC	R_1 0.3 DLC	R_1 0.5 DLC	mm	mm	mm	mm	mm	mm	mm	
0,8×4	—	eShop	eShop	—	—	0.8	4	0.78	50	4	0.02	0.02	1
0,8×6	—	eShop	eShop	—	—	0.8	6	0.78	50	4	0.02	0.02	0.8
0,8×8	—	eShop	eShop	—	—	0.8	8	0.78	50	4	0.016	0.016	0.5
0,8×10	—	eShop	eShop	—	—	0.8	10	0.78	50	4	0.016	0.016	0.35
0,8×12	—	eShop	eShop	—	—	0.8	12	0.78	50	4	0.016	0.016	0.2
1×2	—	eShop	eShop	eShop	—	1	2	0.95	50	4	0.03	0.03	1
1×3	—	eShop	eShop	eShop	—	1	3	0.95	50	4	0.03	0.03	1
1×4	—	eShop	eShop	eShop	—	1	4	0.95	50	4	0.03	0.03	1
1×5	—	eShop	eShop	eShop	—	1	5	0.95	50	4	0.03	0.03	1
1×6	—	eShop	eShop	eShop	—	1	6	0.95	50	4	0.03	0.03	0.9
1×8	—	eShop	eShop	eShop	—	1	8	0.95	50	4	0.03	0.03	0.8
1×10	—	eShop	eShop	eShop	—	1	10	0.95	50	4	0.03	0.03	0.5
1×12	—	eShop	eShop	eShop	—	1	12	0.95	55	4	0.025	0.025	0.35
1×15	—	eShop	eShop	eShop	—	1	15	0.95	60	4	0.025	0.025	0.2
1×16	—	eShop	—	—	—	1	16	0.95	60	4	0.025	0.25	0.15
1×20	—	eShop	eShop	eShop	—	1	20	0.95	60	4	0.02	0.02	0.08
1×25	—	eShop	eShop	eShop	—	1	25	0.95	70	4	0.02	0.02	0.04
1×30	—	eShop	eShop	eShop	—	1	30	0.95	70	4	0.016	0.016	0.02
1,2×5	—	eShop	eShop	eShop	—	1.2	5	1.14	50	4	0.03	0.03	1
1,2×10	—	eShop ■	eShop	eShop	—	1.2	10	1.14	50	4	0.03	0.03	0.8
1,2×15	—	eShop	eShop	eShop	—	1.2	15	1.14	55	4	0.025	0.025	0.35
1,2×20	—	eShop	eShop	eShop	—	1.2	20	1.14	60	4	0.025	0.025	0.12
1,5×4	—	eShop	eShop	eShop	eShop	1.5	4	1.44	50	4	0.03	0.03	1
1,5×6	—	eShop	eShop	eShop	eShop	1.5	6	1.44	50	4	0.03	0.03	1
1,5×8	—	eShop ■	eShop	eShop	eShop	1.5	8	1.44	50	4	0.03	0.03	1
1,5×10	—	eShop	eShop	eShop	eShop	1.5	10	1.44	50	4	0.03	0.03	0.9
1,5×12	—	eShop	eShop	eShop	eShop	1.5	12	1.44	55	4	0.03	0.03	0.8
1,5×15	—	eShop	eShop	eShop	eShop	1.5	15	1.44	55	4	0.025	0.025	0.5
1,5×20	—	eShop	eShop	eShop	eShop	1.5	20	1.44	60	4	0.025	0.025	0.35
1,5×25	—	eShop	eShop	eShop	eShop	1.5	25	1.44	60	4	0.025	0.025	0.12
1,5×30	—	eShop	eShop	eShop	eShop	1.5	30	1.44	70	4	0.02	0.02	0.08
1,8×8	—	eShop	eShop	eShop	eShop	1.8	8	1.74	50	4	0.035	0.035	1
1,8×10	—	eShop	eShop	eShop	eShop	1.8	10	1.74	50	4	0.035	0.035	0.9
1,8×15	—	eShop	eShop	eShop	eShop	1.8	15	1.74	50	4	0.035	0.035	0.8
1,8×20	—	eShop	eShop	eShop	eShop	1.8	20	1.74	55	4	0.03	0.03	0.5
2×4	—	eShop	eShop	eShop	eShop	2	4	1.91	50	4	0.035	0.035	1
2×6	—	eShop	eShop	eShop	eShop	2	6	1.91	50	4	0.035	0.035	1
2×8	—	eShop	eShop	eShop	eShop	2	8	1.91	50	4	0.035	0.035	1
2×10	—	eShop ■	eShop	eShop	eShop	2	10	1.91	50	4	0.035	0.035	1
2×12	—	eShop	eShop	eShop	eShop	2	12	1.91	55	4	0.035	0.035	0.9
2×15	—	eShop ■	eShop	eShop	eShop	2	15	1.91	55	4	0.035	0.035	0.8
2×16	—	—	eShop	—	—	2	16	1.91	55	4	0.035	0.035	0.7
2×20	—	eShop	eShop	eShop	eShop	2	20	1.91	60	4	0.03	0.03	0.5
2×25	—	eShop	eShop	eShop	eShop	2	25	1.91	70	4	0.03	0.03	0.35
2×30	—	eShop	eShop	eShop	eShop	2	30	1.91	70	4	0.03	0.03	0.2
2×35	—	eShop	eShop	eShop	eShop	2	35	1.91	80	4	0.025	0.025	0.08
2×40	—	eShop	eShop	eShop	eShop	2	40	1.91	80	4	0.025	0.025	0.04
2,5×15	—	—	eShop ■	eShop	eShop	2.5	15	2.41	55	4	0.035	0.035	0.9
2,5×20	—	—	eShop	eShop	eShop	2.5	20	2.41	55	4	0.035	0.035	0.8
2,5×25	—	—	eShop	eShop	eShop	2.5	25	2.41	60	4	0.03	0.03	0.5
2,5×30	—	—	eShop	eShop	eShop	2.5	30	2.41	70	4	0.03	0.03	0.35
3×6	—	—	eShop	eShop	eShop	4.5	6	2.91	50	4	0.035	0.035	1
3×8	—	—	eShop	eShop	eShop	4.5	8	2.91	50	4	0.035	0.035	1
3×10	—	—	eShop ■	eShop	eShop	4.5	10	2.91	50	4	0.035	0.035	1
3×12	—	—	eShop	eShop	eShop	4.5	12	2.91	50	4	0.035	0.035	1
3×15	—	—	eShop ■	eShop	eShop	4.5	15	2.91	55	4	0.035	0.035	1
3×20	—	—	eShop ■	eShop	eShop	4.5	20	2.91	55	4	0.035	0.035	0.9
3×25	—	—	eShop	eShop	eShop	4.5	25	2.91	60	4	0.035	0.035	0.8
3×30	—	—	eShop	eShop	eShop	4.5	30	2.91	70	4	0.03	0.03	0.5
3×35	—	—	eShop	eShop	eShop	4.5	35	2.91	80	4	0.03	0.03	0.35
3×40	—	—	eShop	eShop	eShop	4.5	40	2.91	80	4	0.03	0.03	0.35
3×45	—	—	eShop	eShop	eShop	4.5	45	2.91	90	4	0.03	0.03	0.2



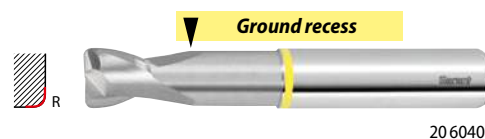
Garant Solid carbide torus cutter

With **double relief ground side clearance angle** and **corner radius**.

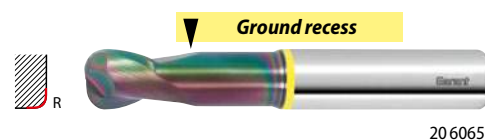
High strength due to **strengthened core**.

Tolerance: $R_1 = \pm 0.01 \text{ mm}$.

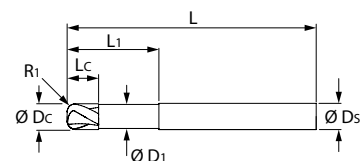
20 6065 – With the latest generation of **DLC coating** sp².



20 6040



20 6065



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 6040	180	140	105	180	130	150	130	110									80	100					
20 6065	330	300	230	200	160	200	150	130		180	160	150	130	160		300	100	120					

$\varnothing e8 D_c / R_1$	20 6040	20 6065	L_c	R_1	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Alu	Alu
	Solid carbide torus cutter								f_z	f_z
mm	uncoated	DLC	mm	mm	mm	mm	mm	mm	mm	mm
3/0,3	eShop	eShop	4	0.3	14	2.7	50	3	0.01	0.011
4/0,3	eShop	eShop	5	0.3	16	3.7	50	4	0.02	0.023
4/1,0	eShop	eShop	5	1	16	3.7	50	4	0.02	0.023
5/0,3	eShop	eShop	6	0.3	18	4.6	54	5	0.02	0.023
5/1,0	eShop	eShop	6	1	18	4.6	54	5	0.02	0.023
6/0,3	eShop	eShop	7	0.3	21	5.5	57	6	0.03	0.034
6/1,0	eShop	eShop	7	1	21	5.5	57	6	0.03	0.034
6/2,0	eShop	eShop	7	2	21	5.5	57	6	0.03	0.034
8/0,3	eShop	eShop	9	0.3	27	7.4	63	8	0.04	0.045
8/1,0	eShop	eShop	9	1	27	7.4	63	8	0.04	0.045
8/2,0	eShop	eShop	9	2	27	7.4	63	8	0.04	0.045
10/0,3	eShop	eShop	11	0.3	32	9.2	72	10	0.05	0.056
10/1,0	eShop	eShop	11	1	32	9.2	72	10	0.05	0.056
10/1,5	eShop	eShop	11	1.5	32	9.2	72	10	0.05	0.056
10/3,0	eShop	eShop	11	3	32	9.2	72	10	0.05	0.056
12/1,0	eShop	eShop	12	1	38	11	83	12	0.07	0.079
12/1,5	eShop	eShop	12	1.5	38	11	83	12	0.07	0.079
12/2,5	eShop	eShop	12	2.5	38	11	83	12	0.07	0.079
12/4,0	eShop	eShop	12	4	38	11	83	12	0.07	0.079
16/1,0	eShop	eShop	16	1	44	15	92	16	0.09	0.1
16/2,0	eShop	eShop	16	2	44	15	92	16	0.09	0.1
16/2,5	eShop	eShop	16	2.5	44	15	92	16	0.09	0.1
16/5,0	eShop	eShop	16	5	44	15	92	16	0.09	0.1
20/5,0	eShop	eShop	20	5	54	19	104	20	0.12	0.15



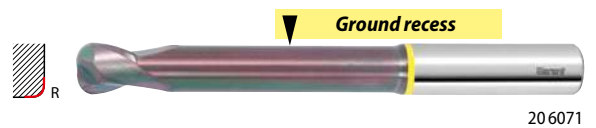
Garant Solid carbide torus cutter

With the latest generation of **DLC coating** sp^2 .

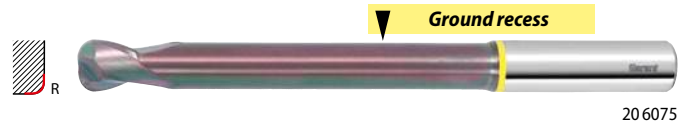
With **double relief** ground side clearance angle and corner radius.

High stability due to **strengthened core**.

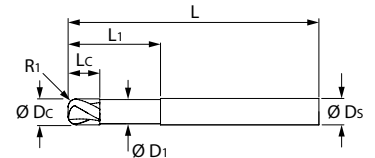
Tolerance: $R_1 = \pm 0.01 \text{ mm}$.



20 6071



20 6075

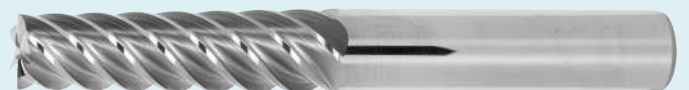


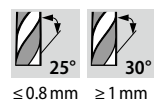
Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 6071	200	160	120	150	100	120	100	90		110	100	90	90	100			100	120					
20 6075	180	140	105	130	80	100	80	70		90	80	70	70	80			100	120					

$\varnothing e8$ D_c / R_1	11X	20 6071	11X	20 6075	L_c	R_1	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z	f_z
		Solid carbide torus cutter										
							20 6071	20 6075	20 6071	20 6075		
mm		DLC	DLC		mm	mm	mm	mm	mm	mm	mm	mm
3/0,3		eShop	—		4	0.3	32	—	2.7	75	—	0.01
4/0,3		eShop	—		5	0.3	36	—	3.7	75	—	0.02
5/0,3		eShop	—		6	0.3	40	—	4.6	75	—	0.02
6/0,3		eShop	eShop		7	0.3	44	80	5.5	80	120	0.03
6/1,0		eShop	eShop		7	1	44	80	5.5	80	120	0.03
6/2,0		eShop	—		7	2	44	—	5.5	80	—	0.03
8/0,3		eShop	eShop		9	0.3	54	90	7.4	100	130	0.04
8/1,0		eShop	eShop		9	1	54	90	7.4	100	130	0.04
8/2,0		eShop	eShop		9	2	54	90	7.4	100	130	0.04
10/0,3		eShop	eShop		11	0.3	60	110	9.2	100	150	0.05
10/1,5		eShop	—		11	1.5	60	—	9.2	100	—	0.05
10/3,0		eShop	eShop		11	3	60	110	9.2	100	150	0.05
12/1,5		eShop	eShop		12	1.5	75	115	11	120	160	0.07
12/2,5		eShop	eShop		12	2.5	75	115	11	120	160	0.07
12/4,0		eShop	eShop		12	4	75	115	11	120	160	0.07
16/2,0		eShop	eShop		16	2	92	140	15	150	200	0.09
16/2,5		eShop	eShop		16	2.5	92	140	15	150	200	0.09
16/5,0		eShop	—		16	5	92	—	15	150	—	0.09

Do you need a tapered die-sinking cutter for your production?

Ask the employees / technical advisers of the Hoffmann Group!
We will be happy to prepare our quotation for you.





GARANT Diabolo solid carbide precision micro torus cutter

GARANT Diabolo:

Special geometry, coating and carbide **for hard machining in the high-performance field.**

Suitable even for machining **electrolytic copper.**

Double-relief ground with 2 chamfers hollow ground for high-precision hard machining.

Recess angle $\alpha = 16^\circ$.

Tolerances:

■ Corner radius: $R_1 = \pm 0.0025$ mm.

■ Neck $\varnothing$: $D_1 = 0 / -0.01$ mm.

Note:

At greater tool overhang lengths, use a reduced value for a_p !

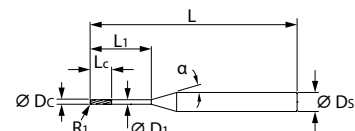
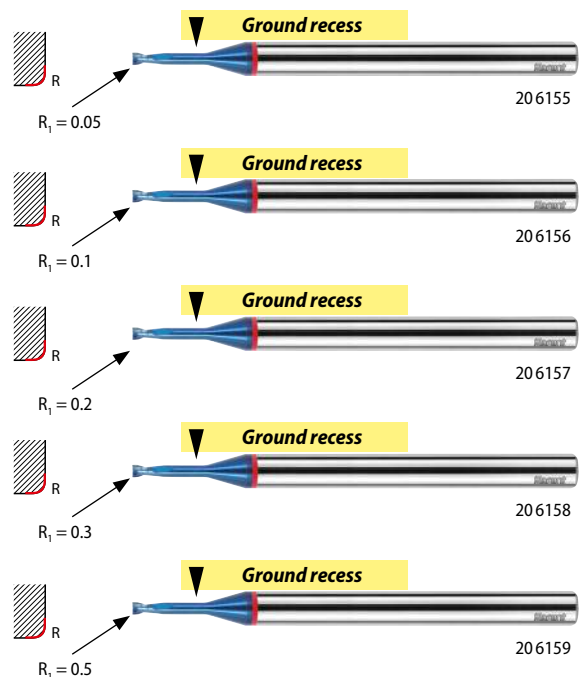
Values for:

side milling: $a_p = 0.1 \times D \times a_{p,corr}$

copying: $a_p = 0.05 \times D \times a_{p,corr}$

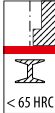
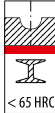
To calculate the feed rate v_f please use the actual speed of the machine (the maximum possible speed)!

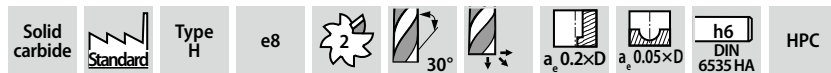
e.g. $v_f = 18000$ [rpm] $\times f_z$ [mm/Z] $\times z$



Suitable for/ v_c [m/min]	Alu plastics 	Alu cast > 10 % Si 	< 500 N 	< 750 N 	< 900 N 	< 1100 N 	< 1400 N 	< 50 HRC 	< 55 HRC 	< 60 HRC 	< 65 HRC 	< 67 HRC 	< 70 HRC 	INOX < 900 N 	INOX > 900 N 	Ti > 850 N 	CuZn 									
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	H	M	M	S	N									
20 6155–20 6159					200	200	190	170	120	100	72	55	50	45	90	80	140									

$\varnothing D_c \times L_1$	20 6155	20 6156	20 6157	20 6158	20 6159	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z	f_z	Correction factor $a_{p,corr}$
GARANT Diabolo solid carbide torus cutter													
mm	R_1 0.05 TiAlN	R_1 0.1 TiAlN	R_1 0.2 TiAlN	R_1 0.3 TiAlN	R_1 0.5 TiAlN	mm	mm	mm	mm	mm	mm	mm	
0,2x0,5	eShop	—	—	—	—	0.2	0.5	0.18	50	4	0.009	0.009	1
0,2x1	eShop	—	—	—	—	0.2	1	0.18	50	4	0.009	0.009	1
0,2x1,5	eShop	—	—	—	—	0.2	1.5	0.18	50	4	0.009	0.009	0.8
0,2x2	eShop	—	—	—	—	0.2	2	0.18	50	4	0.005	0.005	0.5
0,2x3	eShop	—	—	—	—	0.2	3	0.18	50	4	0.005	0.005	0.2
0,3x1	eShop	—	—	—	—	0.3	1	0.28	50	4	0.012	0.012	1
0,3x2	eShop	—	—	—	—	0.3	2	0.28	50	4	0.012	0.012	0.9
0,3x3	eShop	—	—	—	—	0.3	3	0.28	50	4	0.009	0.009	0.5
0,3x4	eShop	—	—	—	—	0.3	4	0.28	50	4	0.009	0.009	0.35
0,4x1	eShop	eShop	—	—	—	0.4	1	0.38	50	4	0.012	0.012	1
0,4x2	eShop	eShop	—	—	—	0.4	2	0.38	50	4	0.012	0.012	1
0,4x3	eShop	eShop	—	—	—	0.4	3	0.38	50	4	0.012	0.012	0.8
0,4x4	eShop	eShop	—	—	—	0.4	4	0.38	50	4	0.009	0.009	0.5
0,4x5	eShop	eShop	—	—	—	0.4	5	0.38	50	4	0.009	0.009	0.35
0,4x6	eShop	eShop	—	—	—	0.4	6	0.38	50	4	0.009	0.009	0.2
0,5x1	eShop	eShop	—	—	—	0.5	1	0.48	50	4	0.015	0.015	1
0,5x2	eShop	eShop	—	—	—	0.5	2	0.48	50	4	0.015	0.015	1
0,5x3	eShop	eShop	—	—	—	0.5	3	0.48	50	4	0.015	0.015	0.9
0,5x4	eShop	eShop	—	—	—	0.5	4	0.48	50	4	0.015	0.015	0.8
0,5x5	eShop	eShop	—	—	—	0.5	5	0.48	50	4	0.012	0.012	0.5
0,5x6	eShop	eShop	—	—	—	0.5	6	0.48	50	4	0.012	0.012	0.35
0,5x8	eShop	eShop	—	—	—	0.5	8	0.48	50	4	0.012	0.012	0.12
0,5x10	eShop	eShop	—	—	—	0.5	10	0.48	50	4	0.009	0.009	0.08
0,6x2	eShop	eShop	—	—	—	0.6	2	0.58	50	4	0.015	0.015	1
0,6x3	eShop	eShop	—	—	—	0.6	3	0.58	50	4	0.015	0.015	1
0,6x4	eShop	eShop	—	—	—	0.6	4	0.58	50	4	0.015	0.015	0.9
0,6x5	eShop	eShop	—	—	—	0.6	5	0.58	50	4	0.015	0.015	0.8

$\varnothing D_c \times L_1$	11X 20 6155	11X 20 6156	11X 20 6157	11X 20 6158	11X 20 6159	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$			Correction factor $a_{p,corr}$
mm	R ₁ 0.05 TiAlN	R ₁ 0.1 TiAlN	R ₁ 0.2 TiAlN	R ₁ 0.3 TiAlN	R ₁ 0.5 TiAlN	mm	mm	mm	mm	mm	mm	mm	
0,6×6	eShop	eShop	—	—	—	0.6	6	0.58	50	4	0.012	0.012	0.5
0,6×8	eShop	eShop	—	—	—	0.6	8	0.58	50	4	0.012	0.012	0.35
0,6×10	eShop	eShop	—	—	—	0.6	10	0.58	50	4	0.012	0.012	0.12
0,8×2	—	eShop	eShop	—	—	0.8	2	0.78	50	4	0.015	0.015	1
0,8×3	—	eShop	eShop	—	—	0.8	3	0.78	50	4	0.015	0.015	1
0,8×4	—	eShop	eShop	—	—	0.8	4	0.78	50	4	0.015	0.015	1
0,8×5	—	eShop	eShop	—	—	0.8	5	0.78	50	4	0.015	0.015	0.9
0,8×6	—	eShop	eShop	—	—	0.8	6	0.78	50	4	0.015	0.015	0.8
0,8×8	—	eShop	eShop	—	—	0.8	8	0.78	50	4	0.012	0.012	0.5
0,8×10	—	eShop	eShop	—	—	0.8	10	0.78	50	4	0.012	0.012	0.35
1×2	—	eShop	eShop	eShop	—	1	2	0.95	50	4	0.02	0.02	1
1×3	—	eShop	eShop	eShop	—	1	3	0.95	50	4	0.02	0.02	1
1×4	—	eShop	eShop	eShop	—	1	4	0.95	50	4	0.02	0.02	1
1×5	—	eShop	eShop	eShop	—	1	5	0.95	50	4	0.02	0.02	1
1×6	—	eShop	eShop	eShop	—	1	6	0.95	50	4	0.02	0.02	0.9
1×8	—	eShop	eShop	eShop	—	1	8	0.95	50	4	0.02	0.02	0.8
1×10	—	eShop	eShop	eShop	—	1	10	0.95	50	4	0.015	0.015	0.5
1×12	—	eShop	eShop	eShop	—	1	12	0.95	55	4	0.015	0.015	0.35
1×14	—	eShop	eShop	eShop	—	1	14	0.95	55	4	0.015	0.015	0.2
1×16	—	eShop	eShop	eShop	—	1	16	0.95	60	4	0.015	0.015	0.12
1×18	—	eShop	eShop	eShop	—	1	18	0.95	60	4	0.01	0.01	0.08
1×20	—	eShop	eShop	eShop	—	1	20	0.95	60	4	0.01	0.01	0.04
1×25	—	eShop	eShop	eShop	—	1	25	0.95	70	4	0.01	0.01	0.04
1,2×5	—	eShop	eShop	eShop	—	1.2	5	1.14	50	4	0.02	0.02	1
1,2×10	—	eShop	eShop	eShop	—	1.2	10	1.14	50	4	0.02	0.02	0.8
1,2×15	—	eShop	eShop	eShop	—	1.2	15	1.14	55	4	0.015	0.015	0.35
1,2×20	—	eShop	eShop	eShop	—	1.2	20	1.14	60	4	0.015	0.015	0.12
1,5×3	—	eShop	eShop	eShop	eShop	1.5	3	1.44	50	4	0.02	0.02	1
1,5×4	—	eShop	eShop	eShop	eShop	1.5	4	1.44	50	4	0.02	0.02	1
1,5×6	—	eShop	eShop	eShop	eShop	1.5	6	1.44	50	4	0.02	0.02	1
1,5×8	—	eShop	eShop	eShop	eShop	1.5	8	1.44	50	4	0.02	0.02	1
1,5×10	—	eShop	eShop	eShop	eShop	1.5	10	1.44	50	4	0.02	0.02	0.9
1,5×12	—	eShop	eShop	eShop	eShop	1.5	12	1.44	55	4	0.02	0.02	0.8
1,5×14	—	eShop	eShop	eShop	eShop	1.5	14	1.44	55	4	0.02	0.02	0.8
1,5×16	—	eShop	eShop	eShop	eShop	1.5	16	1.44	55	4	0.015	0.015	0.5
1,5×18	—	eShop	eShop	eShop	eShop	1.5	18	1.44	60	4	0.015	0.015	0.35
1,5×20	—	eShop	eShop	eShop	eShop	1.5	20	1.44	60	4	0.015	0.015	0.35
2×4	—	eShop	eShop	eShop	eShop	2	4	1.91	50	4	0.03	0.03	1
2×6	—	eShop	eShop	eShop	eShop	2	6	1.91	50	4	0.03	0.03	1
2×8	—	eShop	eShop	eShop	eShop	2	8	1.91	50	4	0.03	0.03	1
2×10	—	eShop	eShop	eShop	eShop	2	10	1.91	50	4	0.03	0.03	1
2×12	—	eShop	eShop	eShop	eShop	2	12	1.91	55	4	0.03	0.03	0.9
2×15	—	eShop	eShop	eShop	eShop	2	15	1.91	55	4	0.03	0.03	0.9
2×18	—	eShop	eShop	eShop	eShop	2	18	1.91	60	4	0.03	0.03	0.8
2×20	—	eShop	eShop	eShop	eShop	2	20	1.91	60	4	0.03	0.03	0.8
2×22	—	eShop	eShop	eShop	eShop	2	22	1.91	60	4	0.025	0.025	0.5
2×25	—	eShop	eShop	eShop	eShop	2	25	1.91	70	4	0.025	0.025	0.5
2×30	—	eShop	eShop	eShop	eShop	2	30	1.91	70	4	0.025	0.025	0.35
2×35	—	eShop	eShop	eShop	eShop	2	35	1.91	80	4	0.025	0.025	0.2
2×40	—	eShop	eShop	eShop	eShop	2	40	1.91	80	4	0.02	0.02	0.08
2,5×8	—	—	eShop	eShop	eShop	2.5	8	2.41	50	4	0.03	0.03	1
2,5×10	—	—	eShop	eShop	eShop	2.5	10	2.41	50	4	0.03	0.03	1
2,5×15	—	—	eShop	eShop	eShop	2.5	15	2.41	55	4	0.03	0.03	0.9
2,5×20	—	—	eShop	eShop	eShop	2.5	20	2.41	55	4	0.03	0.03	0.8
2,5×25	—	—	eShop	eShop	eShop	2.5	25	2.41	60	4	0.025	0.025	0.5
2,5×30	—	—	eShop	eShop	eShop	2.5	30	2.41	70	4	0.025	0.025	0.35
3×8	—	—	—	eShop	eShop	4.5	8	2.91	50	4	0.03	0.03	1
3×10	—	—	—	eShop	eShop	4.5	10	2.91	50	4	0.03	0.03	1
3×12	—	—	—	eShop	eShop	4.5	12	2.91	50	4	0.03	0.03	1
3×15	—	—	—	eShop	eShop	4.5	15	2.91	55	4	0.03	0.03	1
3×18	—	—	—	eShop	eShop	4.5	18	2.91	55	4	0.03	0.03	0.9
3×20	—	—	—	eShop	eShop	4.5	20	2.91	55	4	0.03	0.03	0.9
3×25	—	—	—	eShop	eShop	4.5	25	2.91	60	4	0.03	0.03	0.8
3×30	—	—	—	eShop	eShop	4.5	30	2.91	70	4	0.02	0.02	0.5
3×35	—	—	—	eShop	eShop	4.5	35	2.91	80	4	0.02	0.02	0.35
3×40	—	—	—	eShop	eShop	4.5	40	2.91	80	4	0.02	0.02	0.35



Garant GARANT Diabolo solid carbide torus cutter HPC

GARANT Diabolo:

Special geometry, coating and carbide for hard machining.

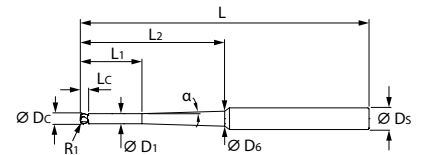
For copy milling with **angle α : 1° 30'**. Double relief ground side clearance angle.

Tolerances:

■ Corner radius: $R_1 = \pm 0.005$ mm.

■ Angle $\alpha = \pm 20'$.

Note: Standard application values: f_z for $a_p = 0.1 \times D$.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP				
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N				
20 6162									180	170	140	135	100								

$\varnothing e8 D_c / R_1$	11X	20 6162	L_c	R_1	L_1	$\varnothing D_6$	$\varnothing D_1$	L	$\varnothing D_5$	L_2	f_z	f_z
		GARANT Diabolo solid carbide torus cutter										
		HPC										
		TiAlN										
mm			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0,8/0,08		eShop	1	0.08	1.6	2.1	0.75	75	3	27	0.005	0.005
1/0,1		eShop	1.2	0.1	2	2.3	0.95	75	3	27	0.005	0.005
1/0,25		eShop	2	0.25	4	2.7	0.85	80	6	40	0.005	0.005
1,2/0,12		eShop	1.4	0.12	2.4	2.5	1.15	75	3	27	0.005	0.005
1,5/0,15		eShop	1.8	0.15	3	2.7	1.45	75	3	27	0.005	0.005
2/0,2		eShop	2.4	0.2	4	3	1.95	75	3	27	0.005	0.005
2/0,5		eShop	2	0.5	8	3.5	1.8	80	6	40	0.005	0.005
3/0,3		eShop	3.6	0.3	6	4	2.95	75	4	27	0.019	0.019
3/0,5		eShop	2	0.5	12	4.3	2.8	80	6	40	0.019	0.019
3/1,0		eShop	2	1	12	4.3	2.8	80	6	40	0.019	0.019
4/1,0		eShop	3	1	16	5.1	3.8	80	6	40	0.019	0.019
6/1,0		eShop	4	1	25	7.1	5.8	100	8	50	0.048	0.048
6/2,0		eShop	4	2	25	7.1	5.8	100	8	50	0.048	0.048
8/1,0		eShop	4	1	32	9.3	7.8	120	10	60	0.06	0.06
8/2,0		eShop	4	2	32	9.3	7.8	120	10	60	0.06	0.06
10/1,5		eShop	6	1.5	40	11.9	9.8	160	12	80	0.07	0.07
12/1,5		eShop	8	1.5	50	14.5	11.8	200	16	100	0.08	0.08



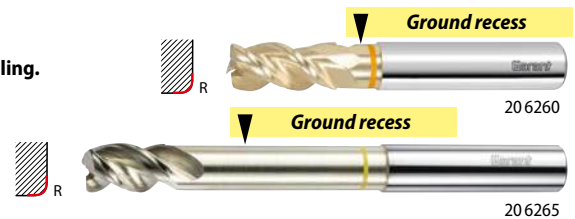
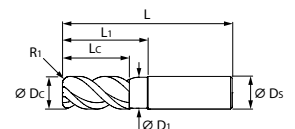
Garant Solid carbide torus cutter HPC

With strong core, **special chip breaker recesses** and **large polished flutes**.

New generation of high performance end mills in the HPC machining range.

Application: Especially for **high speed machining** in mould and tool making for **copy milling**.

Note: 20 6260 – **NEW GENERATION AVAILABLE! Recommended successor product is No. 20 6255.**



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Cu	CuZn				
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	N	N				
20 6260		500	480	240											200	240				
20 6265		250	240	120											100	120				

$\varnothing f8 D_c / R_1$	11X	20 6260	11X	20 6265	L_c		R_1	L_1		$\varnothing D_1$	L		$\varnothing D_5$		
	Solid carbide torus cutter														
	HPC				20 6260	20 6265		20 6260	20 6265		20 6260	20 6265		f_z	f_z
mm	ZOX		ZOX		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
5/0,5	eShop		—		13	—	0.5	18	—	4.7	57	—	6	0.032	0.032
5/1,0	eShop		—		13	—	1	18	—	4.7	57	—	6	0.03	0.03
6/0,5	eShop		eShop		13	10	0.5	18	42	5.7	57	80	6	0.035	0.035
6/1,0	eShop		eShop		13	10	1	18	42	5.7	57	80	6	0.032	0.032
8/0,5	eShop		eShop		21	13	0.5	25	62	7.4	63	100	8	0.055	0.055
8/1,0	eShop		eShop		21	13	1	25	62	7.4	63	100	8	0.05	0.05
10/0,5	eShop		eShop		22	16	0.5	30	58	9.2	72	100	10	0.065	0.065
10/1,0	eShop		eShop		22	16	1	30	58	9.2	72	100	10	0.06	0.06
12/0,5	eShop		eShop		26	19	0.5	36	73	11	83	120	12	0.07	0.07
12/1,0	eShop		eShop		26	19	1	36	73	11	83	120	12	0.065	0.065
16/2,0	eShop		eShop		36	25	2	42	100	15	92	150	16	0.08	0.08
16/4,0	eShop		eShop		36	25	4	42	100	15	92	150	16	0.07	0.07
20/4,0	eShop		eShop		41	32	4	52	98	19	104	150	20	0.1	0.1

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With our regrinding service, you save money and resources.



Hoffmann Group

Regrinding service



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“The efficiency and quality of the reconditioned tools due to the original regrind quality surprised me very positively!”
Marin Engelsberger, Bacher GmbH



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<https://hog.tools/regrinding>



Garant Solid carbide torus cutter

Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium workpieces.

Tolerances:

■ Corner radius

$R_1 = 0.5$ tolerance ± 0.02 .

$R_1 > 0.5 - 1.5$ tolerance ± 0.03 .

$R_1 > 1.5$ tolerance ± 0.05 .

206192 – Dimensions to manufacturer's standard.



206190



206192

Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
206190	180	140	105	180	130	150	130	110									80	100					
206192	130	100	80	130	90	100	90	80									70	90					

Ø h6 D _c / R ₁	11X	20 6190	11X	20 6192	L _c		R ₁	L ₁		Ø D ₁	L		Ø D _s		
	Solid carbide torus cutter														
	mm				20 6190 mm	20 6192 mm	mm	20 6190 mm	20 6192 mm	mm	20 6190 mm	20 6192 mm	mm	mm	mm
5/0,5	eShop	eShop			13	8	0.5	19	30	4.7	57	80	6	0.02	0.02
5/1,0	eShop	eShop			13	8	1	19	30	4.7	57	80	6	0.02	0.02
6/0,5	eShop	eShop			13	10	0.5	19	42	5.7	57	80	6	0.03	0.03
6/1,0	eShop	eShop			13	10	1	19	42	5.7	57	80	6	0.03	0.03
8/0,5	eShop	eShop			21	13	0.5	25	62	7.4	63	100	8	0.04	0.04
8/1,0	eShop	eShop			21	13	1	25	62	7.4	63	100	8	0.04	0.04
8/2,0	eShop	eShop			21	13	2	25	62	7.4	63	100	8	0.04	0.04
10/0,5	eShop	eShop			22	16	0.5	30	58	9.2	72	100	10	0.05	0.05
10/1,0	eShop	eShop			22	16	1	30	58	9.2	72	100	10	0.05	0.05
10/2,0	eShop	eShop			22	16	2	30	58	9.2	72	100	10	0.05	0.05
10/3,0	eShop	eShop			22	16	3	30	58	9.2	72	100	10	0.05	0.05
12/0,5	eShop	eShop			26	19	0.5	36	73	11	83	120	12	0.07	0.08
12/1,0	eShop	eShop			26	19	1	36	73	11	83	120	12	0.07	0.08
12/2,0	eShop	eShop			26	19	2	36	73	11	83	120	12	0.07	0.08
12/3,0	eShop	eShop			26	19	3	36	73	11	83	120	12	0.07	0.08
16/2,0	eShop	eShop			36	25	2	42	100	15	92	150	16	0.09	0.1
16/3,0	eShop	eShop			36	25	3	42	100	15	92	150	16	0.09	0.1
16/4,0	eShop	eShop			36	25	4	42	100	15	92	150	16	0.09	0.1
20/2,0	eShop	eShop			41	32	2	52	98	19	104	150	20	0.12	0.13
20/3,0	eShop	eShop			41	32	3	52	98	19	104	150	20	0.12	0.13
20/4,0	eShop	eShop			41	32	4	52	98	19	104	150	20	0.12	0.13



Garant Solid carbide torus cutter TPC

Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium workpieces.

With double chip-breaker for exemplary chip formation.

With the latest generation of **DLC coating sp²**.

Application: Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres.

Note: $a_{e \max} = 0.12 \times D$ for TPC machining.
 $h_{\max}$: The values stated in the table are maximum values.



206211

Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
206211	280	270	180	125	110	140	90	80		125	115	105	90	110		120	70	90					

Ø h6 D _c / R ₁	20 6211	L _c	R ₁	L ₁	Ø D ₁	L	Ø D _s	Shank form	TPC
mm	mm	mm	mm	mm	mm	mm	mm		
6/0,5	eShop	25	0.5	30	5.7	71	6	HA	0.032
6/1,0	eShop	25	1	30	5.7	71	6	HA	0.032

$\varnothing h_6 D_c / R_1$	11X	20 6211	L_c	R_1	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Shank form	TPC Alu h_{max}
		Solid carbide torus cutter								
mm		TPC DLC	mm	mm	mm	mm	mm	mm		mm
8/0,5		eShop	33	0.5	40	7.4	80	8	HA	0.045
8/1,0		eShop	33	1	40	7.4	80	8	HA	0.045
8/2,0		eShop	33	2	40	7.4	80	8	HA	0.045
10/0,5		eShop	41	0.5	50	9.2	95	10	HA	0.055
10/1,0		eShop	41	1	50	9.2	95	10	HA	0.055
10/2,0		eShop	41	2	50	9.2	95	10	HA	0.055
10/3,0		eShop	41	3	50	9.2	95	10	HA	0.055
12/0,5		eShop	49	0.5	60	11	109	12	HA	0.08
12/1,0		eShop	49	1	60	11	109	12	HA	0.08
12/2,0		eShop	49	2	60	11	109	12	HA	0.08
12/3,0		eShop	49	3	60	11	109	12	HA	0.08
16/2,0		eShop	65	2	80	15	132	16	HB	0.095
16/3,0		eShop	65	3	80	15	132	16	HB	0.095
16/4,0		eShop	65	4	80	15	132	16	HB	0.095
20/2,0		eShop	82	2	100	19	154	20	HB	0.125
20/3,0		eShop	82	3	100	19	154	20	HB	0.125
20/4,0		eShop	82	4	100	19	154	20	HB	0.125

Solid carbide	Type W	h6						G 2.5 "max"
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Garant Solid carbide torus cutter

With the latest generation of DLC coating sp².

Eccentric relief ground, additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium components.

Tolerances:

■ Corner radius

$R_1 = 0.5$ tolerance ± 0.02 .

$R_1 > 0.5 - 1.5$ tolerance ± 0.03 .

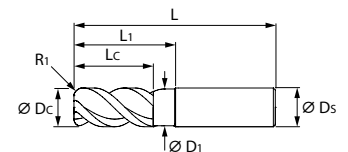
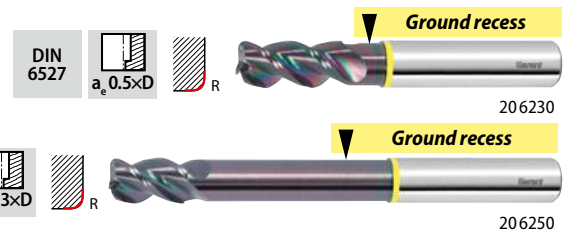
$R_1 > 1.5$ tolerance ± 0.05 .

20 6250 – Dimensions to manufacturer's standard.

Note:

20 6230 – **NEW GENERATION AVAILABLE! Recommended successor product is No. 206255.**

20 6250 – **NEW GENERATION AVAILABLE! Recommended successor product is No. 206261.**



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
			cast > 10% Si	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 6230	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200					
20 6250	280	260	240	120	100	120	90	80		110	100	90	80	90		180	100	120					

Ø h6 D _c / R ₁	11X	20 6230	11X	20 6250	L _c		R ₁	L ₁		Ø D ₁	L		Ø D _s		
		Solid carbide torus cutter			20 6230	20 6250		20 6230	20 6250		20 6230	20 6250		f _z	f _z
mm		DLC		DLC	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4/1,0		eShop		eShop	11	6.5	1	17	24	3.7	57	80	6	0.02	0.02
5/0,5		eShop		eShop	13	8	0.5	19	30	4.7	57	80	6	0.02	0.02
5/1,0		eShop		eShop	13	8	1	19	30	4.7	57	80	6	0.02	0.02
6/0,5		eShop		eShop	13	10	0.5	19	42	5.7	57	80	6	0.03	0.03
6/1,0		eShop		eShop	13	10	1	19	42	5.7	57	80	6	0.03	0.03
8/0,5		eShop		eShop	21	13	0.5	25	62	7.4	63	100	8	0.04	0.04
8/1,0		eShop		eShop	21	13	1	25	62	7.4	63	100	8	0.04	0.04
8/2,0		eShop		eShop	21	13	2	25	62	7.4	63	100	8	0.04	0.04
10/0,5		eShop		eShop	22	16	0.5	30	58	9.2	72	100	10	0.05	0.05
10/1,0		eShop		eShop	22	16	1	30	58	9.2	72	100	10	0.05	0.05
10/2,0		eShop		eShop	22	16	2	30	58	9.2	72	100	10	0.05	0.05
10/3,0		eShop		eShop	22	16	3	30	58	9.2	72	100	10	0.05	0.05
12/0,5		eShop		eShop	26	19	0.5	36	73	11	83	120	12	0.07	0.08
12/1,0		eShop		eShop	26	19	1	36	73	11	83	120	12	0.07	0.08
12/2,0		eShop		eShop	26	19	2	36	73	11	83	120	12	0.07	0.08
12/3,0		eShop		eShop	26	19	3	36	73	11	83	120	12	0.07	0.08
16/1,0		eShop		eShop	36	25	1	42	100	15	92	150	16	0.09	0.1
16/2,0		eShop		eShop	36	25	2	42	100	15	92	150	16	0.09	0.1
16/3,0		eShop		eShop	36	25	3	42	100	15	92	150	16	0.09	0.1
16/4,0		eShop		eShop	36	25	4	42	100	15	92	150	16	0.09	0.1
16/5,0		eShop		eShop	36	25	5	42	100	15	92	150	16	0.09	0.1
20/2,0		eShop		eShop	41	32	2	52	98	19	104	150	20	0.12	0.13
20/3,0		eShop		eShop	41	32	3	52	98	19	104	150	20	0.12	0.13
20/4,0		eShop		eShop	41	32	4	52	98	19	104	150	20	0.12	0.13
20/5,0		eShop		eShop	41	32	5	52	98	19	104	150	20	0.12	0.13

Solid carbide	Type W	e8	3	42°	≠	≠	≠	$a_e 0.5 \times D$	$a_e 0.05 \times D$	h6 DIN 6535 HA	G 2.5 n _{max}	HPC
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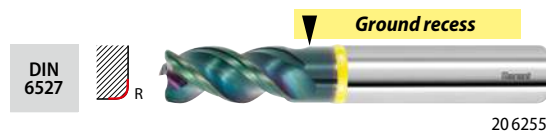
Garant GARANT Master Alu PickPocket solid carbide torus cutter HPC

Cutting edge length to DIN 6527.

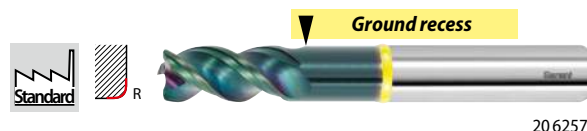
Tolerance: Corner radius $R_1 = \pm 0.01$ mm.

20 6255 – All dimensions to DIN.

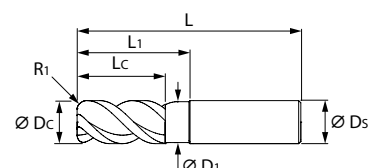
Application: Especially for **high speed machining** in **mould and tool making** for **copy milling**.



20 6255



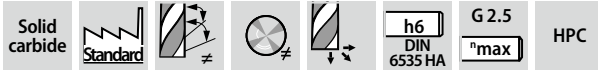
20 6257



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey- comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
20 6255/6257	550	500	450	200	160	200	150	130		180	160	150	130	160	300	160	200					

$\varnothing e8 D_c / R_1$	11X 20 6255	L_c	R_1	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Alu f _z	Alu f _z
	GARANT Master Alu PickPocket solid carbide torus cutter								
	HPC								
	DLC								
mm		mm	mm	mm	mm	mm	mm	mm	mm
4/0,5	eShop	8	0.5	—	—	57	6	0.06	0.07
4/1,0	eShop	8	1	—	—	57	6	0.06	0.07
5/0,5	eShop	9	0.5	—	—	57	6	0.08	0.09
5/1,0	eShop	9	1	—	—	57	6	0.08	0.09
6/0,5	eShop	13	0.5	19	5.8	57	6	0.08	0.09
6/1,0	eShop	13	1	19	5.8	57	6	0.08	0.09
8/0,5	eShop	19	0.5	25	7.8	63	8	0.1	0.12
8/1,0	eShop	19	1	25	7.8	63	8	0.1	0.12
10/0,5	eShop	22	0.5	30	9.8	72	10	0.12	0.14
10/1,0	eShop	22	1	30	9.8	72	10	0.12	0.14
12/0,5	eShop	26	0.5	36	11.8	83	12	0.15	0.16
12/1,0	eShop	26	1	36	11.8	83	12	0.15	0.16
16/1,0	eShop	31	1	42	15.8	92	16	0.18	0.2
16/2,0	eShop	31	2	42	15.8	92	16	0.18	0.2
16/4,0	eShop	31	4	42	15.8	92	16	0.18	0.2
16/5,0	eShop	31	5	42	15.8	92	16	0.18	0.2
20/4,0	eShop	41	4	52	19.8	104	20	0.22	0.25
20/5,0	eShop	41	5	52	19.8	104	20	0.22	0.25

$\varnothing e8 D_c / R_1$	11X 20 6257	L_c	R_1	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Alu f _z	Alu f _z
	GARANT Master Alu PickPocket solid carbide torus cutter								
	HPC								
	DLC								
mm		mm	mm	mm	mm	mm	mm	mm	mm
6/0,5	eShop	13	0.5	24	5.8	62	6	0.06	0.08
6/1,0	eShop	13	1	24	5.8	62	6	0.06	0.08
8/0,5	eShop	19	0.5	30	7.8	68	8	0.07	0.1
8/1,0	eShop	19	1	30	7.8	68	8	0.07	0.1
10/0,5	eShop	22	0.5	38	9.8	80	10	0.08	0.11
10/1,0	eShop	22	1	38	9.8	80	10	0.08	0.11
12/0,5	eShop	26	0.5	46	11.8	93	12	0.1	0.12
12/1,0	eShop	26	1	46	11.8	93	12	0.1	0.12
16/1,0	eShop	31	1	58	15.8	108	16	0.14	0.16
16/2,0	eShop	31	2	58	15.8	108	16	0.14	0.16
16/4,0	eShop	31	4	58	15.8	108	16	0.14	0.16
16/5,0	eShop	31	5	58	15.8	108	16	0.14	0.16
20/4,0	eShop	41	4	74	19.8	126	20	0.18	0.2
20/5,0	eShop	41	5	74	19.8	126	20	0.18	0.2



Garant **GARANT Master Alu SlotMachine solid carbide torus cutter HPC/TPC,**
GARANT Master Alu PickPocket solid carbide torus cutter HPC,
GARANT Master Alu solid carbide torus cutter HPC

Eccentric relief ground, additionally polish ground in the flutes for outstanding chip evacuation in long-chipping non-ferrous materials.

20 6258 – With a new knurled profile, optimised for higher feed rates. Tremendous bending strength due to the use of an innovative micrograin substrate.

20 6261/6264 – Tolerances:

■ Corner radius

$R_1 = 0.5$ tolerance ± 0.02 mm.

$R_1 > 0.5 - 1.5$ tolerance ± 0.03 mm.

$R_1 > 1.5$ tolerance ± 0.05 mm.

Application:

20 6264 – Particularly suitable for finishing work.



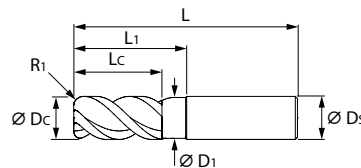
20 6258



20 6261



20 6264



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 6258	450	400	380			120	100										160	200					
20 6261	340	320	290	150	120	150	110	100		130	120	110	100	110		220	120	150					
20 6264	500	450	400	180	140	180	130	110		160	140	120	140	260		260	140	120					

$\varnothing e8$ D_c / R_1	$\times$ 20 6258	No. of teeth Z	L_c	R_1	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z	f_z
	GARANT Master Alu SlotMachine solid carbide torus cutter									
	HPC / TPC									
	DLC									
mm			mm	mm	mm	mm	mm	mm	mm	mm
6/0,5	eShop	3	25	0.5	30	5.5	65	6	0.07	0.08
6/1,0	eShop	3	25	1	30	5.5	65	6	0.07	0.08
8/0,5	eShop	3	33	0.5	40	7.5	75	8	0.09	0.1
8/1,0	eShop	3	33	1	40	7.5	75	8	0.09	0.1
8/2,0	eShop	3	33	2	40	7.5	75	8	0.09	0.1
10/0,5	eShop	3	41	0.5	50	9.5	90	10	0.1	0.12
10/2,0	eShop	3	41	2	50	9.5	90	10	0.1	0.12
12/1,0	eShop	3	49	1	60	11	100	12	0.13	0.15
12/3,0	eShop	3	49	3	60	11	100	12	0.13	0.15
16/2,0	eShop	4	65	2	80	15	125	16	0.17	0.2
20/2,0	eShop	4	82	2	100	19	150	20	0.2	0.25
20/3,0	eShop	4	82	3	100	19	150	20	0.2	0.25

Ø e6 D _c / R ₁	1X 20 6261	1X 20 6264	No. of teeth Z		L _c		R ₁	L ₁		Ø D ₁	L		Ø D _s				
	GARANT Master Alu PickPocket solid carbide torus cutter	GARANT Master Alu solid carbide torus cutter												f _z		f _z	
			HPC		20 6261	20 6264		20 6261	20 6264		20 6261	20 6264		20 6261	20 6264	20 6261	
			DLC	DLC	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
mm																	
4/0,5	eShop	—	3	—	6.5	—	0.5	24	—	3.7	83	—	6	0.03	—	0.035	
4/1,0	eShop	—	3	—	6.5	—	1	24	—	3.7	83	—	6	0.03	—	0.035	
5/0,5	eShop	—	3	—	8	—	0.5	30	—	4.7	83	—	6	0.035	—	0.04	
5/1,0	eShop	—	3	—	8	—	1	30	—	4.7	83	—	6	0.035	—	0.04	
6/0,5	eShop	eShop	3	4	10	25	0.5	42	30	5.7	83	65	6	0.04	0.045	0.045	
6/1,0	eShop	eShop	3	4	10	25	1	42	30	5.7	83	65	6	0.04	0.045	0.045	
8/0,5	eShop	eShop	3	4	13	33	0.5	62	40	7.4	100	75	8	0.045	0.05	0.05	
8/1,0	eShop	eShop	3	4	13	33	1	62	40	7.4	100	75	8	0.045	0.05	0.05	
8/2,0	eShop	eShop	3	4	13	33	2	62	40	7.4	100	75	8	0.045	0.05	0.05	
10/0,5	eShop	eShop	3	4	16	41	0.5	68	50	9.2	110	90	10	0.05	0.06	0.06	
10/1,0	eShop	—	3	—	16	—	1	68	—	9.2	110	—	10	0.05	—	0.06	
10/2,0	eShop	eShop	3	4	16	41	2	68	50	9.2	110	90	10	0.05	0.06	0.06	
10/3,0	eShop	—	3	—	16	—	3	68	—	9.2	110	—	10	0.05	—	0.06	
12/0,5	eShop	—	3	—	19	—	0.5	73	—	11	120	—	12	0.05	—	0.06	
12/1,0	eShop	eShop	3	4	19	49	1	73	60	11	120	100	12	0.05	0.06	0.06	
12/2,0	eShop	—	3	—	19	—	2	73	—	11	120	—	12	0.05	—	0.06	
12/3,0	eShop	eShop	3	4	19	49	3	73	60	11	120	100	12	0.05	0.06	0.06	
16/1,0	eShop	—	3	—	25	—	1	100	—	15	150	—	16	0.06	—	0.07	
16/2,0	eShop	eShop	3	5	25	65	2	100	80	15	150	125	16	0.06	0.07	0.07	
16/5,0	eShop	—	3	—	25	—	5	100	—	15	150	—	16	0.06	—	0.07	
20/2,0	—	eShop	—	5	—	82	2	—	100	19	—	150	20	—	0.08	—	
20/3,0	—	eShop	—	5	—	82	3	—	100	19	—	150	20	—	0.08	—	



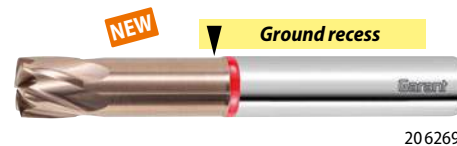
Garant Solid carbide high feed rate milling cutter HSC

Innovative ultra-fine grain substrate, especially for hard machining up to 70 HRC.
Newly developed high-performance coating for outstanding tool life and optimum metal removal rate.

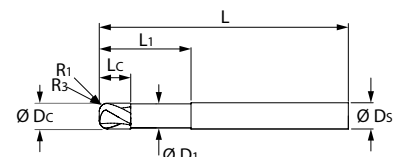
Tolerance: Corner radius $R_1 = \pm 0.01\text{ mm}$

Application: Especially for high-speed cutting (HSC) in mould and tool making, for copy and traverse milling. Very high machining volume in hard machining.

Note: Successor product to No. 206273.



206269

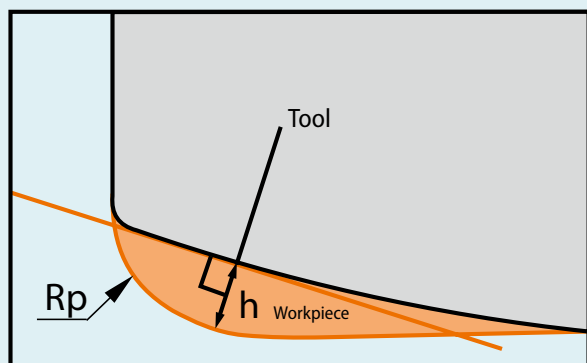


Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
20 6269									105	105	75	64	53	53									

Ø h8 D _c	11Z 20 6269	No. of teeth Z	 a _{p,max} transverse	Programming radius	R ₁	R ₃	L _c	L ₁	Ø D ₁	L	Ø D _s	 f _z
mm	HSC AlTiSiN		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	eShop	4	0.12	0.129	0.1	1.2	1	3	0.95	57	6	0.036
2	eShop	4	0.17	0.187	0.11	2.4	2	4	1.95	57	6	0.071
3	eShop	4	0.28	0.308	0.2	3.6	3	8	2.9	57	6	0.111
4	eShop	4	0.33	0.36	0.2	4.8	3	8	3.9	57	6	0.145
5	eShop	6	0.41	0.45	0.25	6	4	15	4.8	57	6	0.191
6	eShop	6	0.49	0.539	0.3	7.2	5	15	5.8	57	6	0.226
8	eShop	6	0.65	0.718	0.4	9.6	7	20	7.8	70	8	0.316
10	eShop	6	0.81	0.898	0.5	12	10	30	9.7	80	10	0.386
12	eShop	6	0.9	1	0.5	14.4	12	30	11.7	90	12	0.444

Garant Application notes

Always use the programming radius R_p when programming in the CAM system.



Dc	Programmed radius R_p	max. residual material height h	Ramping angle	Circular interpo- lation milling D_{min}	Circular interpo- lation milling D_{max}
mm	mm	mm		mm	mm
Ø 1	0.129	0.021	0.5 degrees or less	1.3	2
Ø 2	0.187	0.059		2.5	3.8
Ø 3	0.308	0.082		3.8	5.8
Ø 4	0.360	0.121		5.2	7.8
Ø 5	0.450	0.151		6.3	9.6
Ø 6	0.539	0.180		7.5	11.5
Ø 8	0.718	0.241		10.2	15.5
Ø 10	0.898	0.301		12.6	19.2
Ø 12	1	0.377		15.2	23

CAD data is available in the Hoffmann Group eShop.



Garant GARANT Diabolo solid carbide end torus cutter HPC

GARANT Diabolo:

Special geometry, coating and carbide for hard machining.

Tolerance: Corner radius $R_1 = \pm 0.01$ mm.

Special centre cutting edge geometry for traverse milling at very high feed rates.

Application: For copy and traverse milling in hard machining under HPC / HSC conditions.

Special milling strategies allow **very high metal removal rates.**

Note: Tools can be reground.

206273 – **Successor product to No. 206276.**

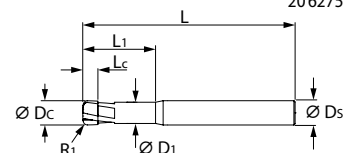
206275 – **Successor product to No. 206278.**



20 6273



20 6275



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
20 6273									190	170	150	110	80						○	○	●	●
20 6275									160	145	130	95	70						○	○	●	●

Ø h9 D _c	1X 20 6273		1X 20 6275		No. of teeth Z	 a _{p max} transverse	Programming radius	L _c	L ₁		Ø D ₁		L		Ø D ₂		 f _z				
	GARANT Diabolo solid carbide end torus cutter								20 6273		20 6275		20 6273		20 6275			20 6273		20 6275	
	HPC																				
	TiAlN		TiAlN						mm		mm		mm		mm			mm		mm	
mm						mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm				
2	eShop		eShop		2	0.06	0.3	1.5	13	18	1.7	54	75	6	0.024	0.018					
3	eShop		eShop		2	0.1	0.3	1.5	15	20	2.7	54	75	6	0.05	0.037					
4	eShop		eShop		2	0.15	0.5	2.5	16	24	3.6	58	85	6	0.067	0.049					
5	eShop		eShop		4	0.17	0.5	3.5	18	28	4.6	65	100	6	0.078	0.059					
6	eShop		eShop		4	0.2	1	3.5	20	28	5.2	65	100	6	0.088	0.065					
8	eShop		eShop		4	0.25	1.5	4.8	24	40	7	70	100	8	0.115	0.086					
10	eShop		eShop		4	0.3	2	5.8	26	48	9	85	100	10	0.158	0.116					
12	eShop		eShop		4	0.4	2	6.8	30	56	11	93	120	12	0.178	0.13					
16	eShop		—		4	0.5	2.5	8.8	35	—	14.5	100	—	16	0.229	—					



Garant GARANT Master Titan solid carbide end torus cutter HPC

Tolerance: Corner radius $R_1 = \pm 0.01$ mm.

Special centre cutting edge geometry for traverse milling at very high feed rates.

Application: For copy and traverse milling of titanium under HPC conditions. Using special milling strategies **very high rates of metal removal can be achieved.**

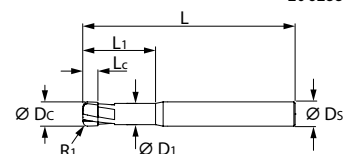
Note: Regrinding not recommended.



20 6286



20 6288



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si										INOX	INOX	Ti	Graphite GRP CRP	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	N							
20 6286															90								
20 6288															80								

Ø h9 D _c	1/2	20 6286	1/2	20 6288	No. of teeth Z	 a _{p max} transverse	Programming radius	L _c	L ₁		Ø D ₁		L		Ø D ₃		Ti			
	GARANT Master Titan solid carbide end torus cutter								20 6286		20 6288		20 6286		20 6288		f			
	HPC								20 6286		20 6288		20 6286		20 6288		20 6286		20 6288	
	mm	TiAlN	TiAlN	mm					mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
2	eShop	eShop	2	0.15	0.3	1.5	13	18	1.7	54	75	6	0.018	0.015						
4	eShop	eShop	2	0.25	0.5	2.5	16	24	3.6	57	85	6	0.061	0.05						
6	eShop	eShop	4	0.4	1	3.5	20	28	5.2	65	100	6	0.082	0.075						
8	eShop	eShop	5	0.5	1.5	4.8	24	40	7	70	100	8	0.108	0.1						
10	eShop	eShop	5	0.7	2	5.8	26	48	9	85	100	10	0.14	0.12						
12	eShop	eShop	5	0.8	2	6.8	30	56	11	93	120	12	0.17	0.15						



Garant Solid carbide end torus cutter HPC

Special centre cutting edge geometry for traverse milling at very high feed rates.
Tolerance: Corner radius $R_1 = \pm 0.01$ mm.

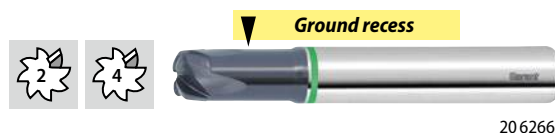
Application: For copy and traverse milling over the full range of hard machining under HPC/HSC conditions.
Using special milling strategies very high rates of metal removal can be achieved.

Note: Tools can be reground.

20 6266 – Successor product to No. 20 6272.

20 6267 – Successor product to No. 20 6274.

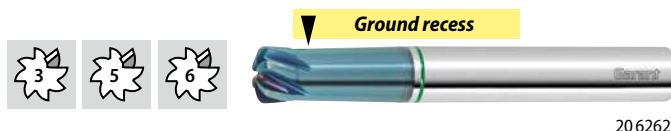
20 6262/6263 – With conically increasing recess to guarantee stability at long overhangs.



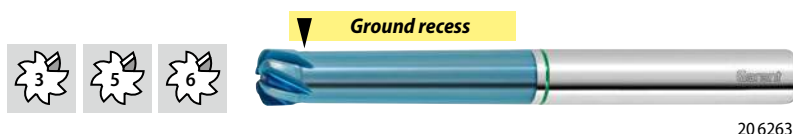
20 6266



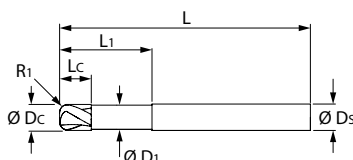
20 6267



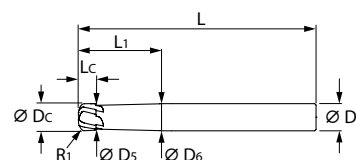
20 6262



20 6263



20 6266, 20 6267



20 6262, 20 6263

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
20 6262				175	170	155	140	130						100	95			●	●	●	○	○	
20 6263				170	150	135	130	125						95	90			●	●	●	○	○	
20 6266				155	150	145	140	130						90				●	●	●	○	○	
20 6267				150	140	130	125	115						80				●	●	●	○	○	

Ø h9 D _c	 20 6266	 20 6267	No. of teeth Z	a _p max trans- verse	Programming ra- dius	L _c	L ₁		Ø D ₁	L		Ø D ₅	 f _z			
mm	Solid carbide end torus cutter						20 6266 mm	20 6267 mm		mm	20 6266 mm		20 6267 mm	mm	20 6266 mm	20 6267 mm
	HPC															
	TiAlN	TiAlN														
2	eShop	eShop	2	0.15	0.3	1.5	13	18	1.7	54	75	6	0.026	0.019		
3	eShop	eShop	2	0.2	0.3	1.5	15	20	2.7	54	75	6	0.056	0.044		
4	eShop	eShop	2	0.25	0.5	2.5	16	24	3.6	58	85	6	0.076	0.06		
5	eShop	eShop	4	0.35	0.5	3.5	18	28	4.6	65	100	6	0.099	0.079		
6	eShop	eShop	4	0.4	1	3.5	20	28	5.2	65	100	6	0.106	0.085		
8	eShop	eShop	4	0.5	1.5	4.8	24	40	7	70	100	8	0.158	0.127		
10	eShop	eShop	4	0.7	2	5.8	26	48	9	85	100	10	0.216	0.172		
12	eShop	eShop	4	0.8	2	6.8	30	56	11	93	120	12	0.266	0.213		
16	eShop	—	4	1	2.5	8.8	35	—	14.5	100	—	16	0.344	—		

Ø h9 D _c	11X 20 6262	11X 20 6263	No. of teeth Z	a _{p max} trans- verse	Programming radii		L _c	L ₁		Ø D ₅	Ø D ₆	L		Ø D ₅	 f _z < 900 N	
	Solid carbide end torus cutter															
	HPC															
mm	TiAlN	TiAlN			mm	20 6262 mm	20 6263 mm	mm	20 6262 mm	20 6263 mm	mm	mm	20 6262 mm	20 6263 mm		mm
2	eShop	—	3	0.15	0.3	—	1.5	13	—	1.7	1.95	54	—	6	0.03	—
4	eShop	eShop	3	0.25	0.5	0.5	2.5	16	24	3.6	3.95	58	85	6	0.07	0.06
5	eShop	—	5	0.35	0.5	—	3.5	18	—	4.6	4.9	65	—	6	0.08	—
6	eShop	eShop	5	0.4	1	1	3.5	20	28	5.2	5.9	65	100	6	0.09	0.07
8	eShop	eShop	5	0.5	1	1.5	4.8	24	40	7	7.9	70	100	8	0.12	0.1
10	eShop	eShop	6	0.7	2	2	5.8	26	48	9	9.9	85	100	10	0.16	0.14
12	eShop	eShop	6	0.8	2	2	6.8	30	56	11	11.9	93	120	12	0.22	0.2



Garant **GARANT Diabolo solid carbide torus cutter HPC**

GARANT Diabolo:

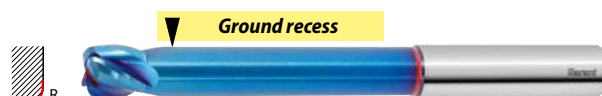
Special geometry, coating and carbide, specially for hard machining.

Double relief ground side clearance angle.

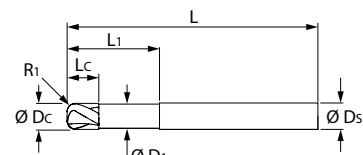
Tolerance: Corner radius $R_1 = \pm 0.005 \text{ mm}$.



206322

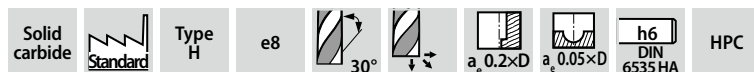


206342



Suitable for/ v _c [m/min]	Alu plastics 6322	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 50 HRC	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
20 6322								200	190	170	150	110								○	○	●	●
20 6342								160	150	135	120	90								○	○	●	●

Ø e8 D _c / R ₁	11X 20 6322		11X 20 6342		L _t	R ₁	L ₁		Ø D ₁	L		Ø D ₃	 f _z	 f _z
	GARANT Diabolo solid carbide torus cutter						20 6322	20 6342		20 6322	20 6342			
	HPC													
	TiAlN	TiAlN												
mm			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
1/0,1	eShop	eShop	1.5	0.1	10	20	0.85	50	75	3	0.005	0.005		
1/0,2	eShop	eShop	1.5	0.2	10	20	0.85	50	75	3	0.005	0.005		
2/0,2	eShop	eShop	2.5	0.2	12	25	1.8	50	75	3	0.005	0.005		
2/0,3	eShop	eShop	2.5	0.3	12	25	1.8	50	75	3	0.005	0.005		
2/0,5	eShop	eShop	2.5	0.5	12	25	1.8	50	75	3	0.005	0.005		
3/0,25	eShop	eShop	4	0.25	14	32	2.7	50	75	3	0.019	0.019		
3/0,3	eShop	eShop	4	0.3	14	32	2.7	50	75	3	0.019	0.019		
3/0,5	eShop	eShop	4	0.5	14	32	2.7	50	75	3	0.019	0.019		
3/1,0	eShop	eShop	4	1	14	32	2.7	50	75	3	0.019	0.019		
4/0,2	eShop	eShop	5	0.2	16	36	3.7	50	75	4	0.019	0.019		
4/0,25	eShop	eShop	5	0.25	16	36	3.7	50	75	4	0.019	0.019		
4/0,4	eShop	eShop	5	0.4	16	36	3.7	50	75	4	0.019	0.019		
4/0,5	eShop	eShop	5	0.5	16	36	3.7	50	75	4	0.019	0.019		
4/1,0	eShop	eShop	5	1	16	36	3.7	50	75	4	0.019	0.019		
5/0,25	eShop	eShop	6	0.25	18	40	4.6	54	75	5	0.048	0.048		
5/0,5	eShop	eShop	6	0.5	18	40	4.6	54	75	5	0.048	0.048		
5/1,0	eShop	eShop	6	1	18	40	4.6	54	75	5	0.048	0.048		
6/0,25	eShop	eShop	7	0.25	21	44	5.5	57	80	6	0.048	0.048		
6/0,5	eShop	eShop	7	0.5	21	44	5.5	57	80	6	0.048	0.048		
6/0,8	eShop	—	7	0.8	21	—	5.5	57	—	6	0.048	0.048		
6/1,0	eShop	eShop	7	1	21	44	5.5	57	80	6	0.048	0.048		
6/1,5	eShop	eShop	7	1.5	21	44	5.5	57	80	6	0.048	0.048		
6/2,0	eShop	—	7	2	21	—	5.5	57	—	6	0.048	0.048		
8/0,25	eShop	eShop	9	0.25	27	54	7.4	63	100	8	0.06	0.06		
8/0,5	eShop	eShop	9	0.5	27	54	7.4	63	100	8	0.06	0.06		
8/0,8	eShop	eShop	9	0.8	27	54	7.4	63	100	8	0.06	0.06		
8/1,0	eShop	eShop	9	1	27	54	7.4	63	100	8	0.06	0.06		
8/1,5	eShop	eShop	9	1.5	27	54	7.4	63	100	8	0.06	0.06		
8/2,0	eShop	eShop	9	2	27	54	7.4	63	100	8	0.06	0.06		
8/2,5	eShop	—	9	2.5	27	—	7.4	63	—	8	0.06	0.06		
8/3,0	eShop	eShop	9	3	27	54	7.4	63	100	8	0.06	0.06		
10/0,25	eShop	eShop	11	0.25	32	60	9.2	72	100	10	0.07	0.07		
10/0,5	eShop	eShop	11	0.5	32	60	9.2	72	100	10	0.07	0.07		
10/0,8	eShop	eShop	11	0.8	32	60	9.2	72	100	10	0.07	0.07		
10/1,0	eShop	eShop	11	1	32	60	9.2	72	100	10	0.07	0.07		
10/1,5	eShop	eShop	11	1.5	32	60	9.2	72	100	10	0.07	0.07		
10/2,0	eShop	eShop	11	2	32	60	9.2	72	100	10	0.07	0.07		
10/3,0	eShop	eShop	11	3	32	60	9.2	72	100	10	0.07	0.07		
10/3,5	eShop	—	11	3.5	32	—	9.2	72	—	10	0.07	0.07		
12/0,5	eShop	eShop	12	0.5	38	75	11	83	120	12	0.08	0.08		
12/1,0	eShop	eShop	12	1	38	75	11	83	120	12	0.08	0.08		
12/1,5	eShop	eShop	12	1.5	38	75	11	83	120	12	0.08	0.08		
12/3,0	eShop	eShop	12	3	38	75	11	83	120	12	0.08	0.08		
12/2,0	eShop	eShop	12	2	38	75	11	83	120	12	0.08	0.08		
16/2,0	eShop	eShop	16	2	44	92	15	92	150	16	0.09	0.09		
16/3,0	eShop	eShop	16	3	44	92	15	92	150	16	0.09	0.09		



GARANT Master Steel solid carbide torus cutter HPC

HPC milling cutter with **newly developed high-performance coating**. For **outstanding tool life** and **optimum metal removal rates** in a range of materials.

With **double relief ground side clearance angle**.

Tolerance: Corner radius R_1

Radius size 0.1 mm – 1 mm: $R_1 = \pm 0.003$ mm.

Radius size > 1.0 mm: $R_1 = \pm 0.005$ mm.

Application: Especially for **high speed machining** in **mould and tool making** for **copy milling**. Excellent results for **dry milling**.

Note:

20 6333 – Successor product to No. 206280.

20 6335 – Successor product to No. 206300.

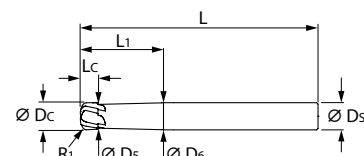
Additional sizes



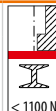
20 6333

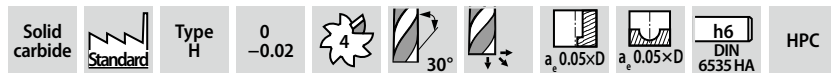


20 6335



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 6333				200	170	120	85	70	40					95	85		110						
20 6335				180	150	110	75	65	35					90	80		100						

Ø e8 D _c / R ₁	11X	20 6333	11X	20 6335	No. of teeth Z	L _c	R ₁	L ₁		Ø D ₅	Ø D ₆	L		Ø D ₅				
	GARANT Master Steel solid carbide torus cutter							20 6333	20 6335			20 6333	20 6335				mm	mm
	HPC		mm	mm														
	mm	TiAlN																
1/0,1		eShop		eShop	4	1.5	0.1	10	20	0.85	0.95	50	75	3	0.005	0.006		
1/0,2		eShop		eShop	4	1.5	0.2	10	20	0.85	0.95	50	75	3	0.005	0.006		
2/0,2		eShop		eShop	4	2.5	0.2	12	25	1.8	1.95	50	75	3	0.008	0.01		
2/0,3		eShop		eShop	4	2.5	0.3	12	25	1.8	1.95	50	75	3	0.008	0.01		
2/0,5		eShop		eShop	4	2.5	0.5	12	25	1.8	1.95	50	75	3	0.008	0.01		
3/0,3		eShop		eShop	4	4	0.3	14	32	2.7	2.9	50	75	3	0.01	0.012		
3/0,5		eShop		eShop	4	4	0.5	14	32	2.7	2.9	50	75	3	0.01	0.012		
3/1,0		eShop		eShop	4	4	1	14	32	2.7	2.9	50	75	3	0.01	0.012		
4/0,4		eShop		eShop	5	5	0.4	16	36	3.7	3.9	50	75	4	0.015	0.018		
4/0,5		eShop		eShop	5	5	0.5	16	36	3.7	3.9	50	75	4	0.015	0.018		
4/1,0		eShop		eShop	5	5	1	16	36	3.7	3.9	50	75	4	0.015	0.018		
5/0,5		eShop		eShop	5	6	0.5	18	40	4.6	4.9	54	75	5	0.018	0.02		
5/1,0		eShop		eShop	5	6	1	18	40	4.6	4.9	54	75	5	0.018	0.02		
6/0,5		eShop		eShop	5	7	0.5	21	44	5.5	5.9	57	83	6	0.022	0.025		
6/1,0		eShop		eShop	5	7	1	21	44	5.5	5.9	57	83	6	0.022	0.025		
6/1,5		eShop		eShop	5	7	1.5	21	44	5.5	5.9	57	83	6	0.022	0.025		
8/0,5		eShop		eShop	5	9	0.5	27	54	7.4	7.9	63	100	8	0.027	0.03		
8/1,0		eShop		eShop	5	9	1	27	54	7.4	7.9	63	100	8	0.027	0.03		
8/1,5		eShop		eShop	5	9	1.5	27	54	7.4	7.9	63	100	8	0.027	0.03		
8/2,0		eShop		eShop	5	9	2	27	54	7.4	7.9	63	100	8	0.027	0.03		
10/0,5		eShop		eShop	5	11	0.5	32	60	9.2	9.9	72	100	10	0.035	0.04		
10/1,0		eShop		eShop	5	11	1	32	60	9.2	9.9	72	100	10	0.035	0.04		
10/1,5		eShop		eShop	5	11	1.5	32	60	9.2	9.9	72	100	10	0.035	0.04		
10/2,0		eShop		eShop	5	11	2	32	60	9.2	9.9	72	100	10	0.035	0.04		
12/0,5		eShop		eShop	5	12	0.5	38	75	11	11.8	83	119	12	0.045	0.05		
12/1,0		eShop		eShop	5	12	1	38	75	11	11.8	83	119	12	0.045	0.05		
12/1,5		eShop		eShop	5	12	1.5	38	75	11	11.8	83	119	12	0.045	0.05		
12/2,0		eShop		eShop	5	12	2	38	75	11	11.8	83	119	12	0.045	0.05		
12/5,0		eShop		eShop	5	12	5	38	75	11	11.8	83	119	12	0.045	0.05		
16/1,0		eShop		eShop	6	16	1	44	92	15	15.8	92	150	16	0.06	0.07		
16/2,0		eShop		eShop	6	16	2	44	92	15	15.8	92	150	16	0.06	0.07		
16/6,0		eShop		eShop	6	16	6	44	92	15	15.8	92	150	16	0.06	0.07		
20/1,0		eShop		eShop	6	20	1	55	92	19	19.8	104	150	20	0.08	0.1		
20/2,5		—		eShop	6	20	2.5	—	92	19	19.8	—	150	20	0.08	0.1		



GARANT Solid carbide torus cutter HPC

GARANT Diabolo 70:

Special solid carbide substrate with extremely high tensile strength combined with outstanding wear resistance for optimum process reliability.

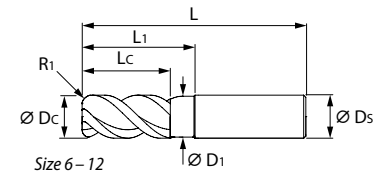
Newly developed nano-crystalline high-tech coating for hard milling up to 70 HRC. Very suitable for continuous use in tool and mould making.

Sizes 2 – 5: Recess angle $\alpha = 15^\circ$.

Tolerances:

■ Corner radius: $R_1 = \pm 0.01$ mm.

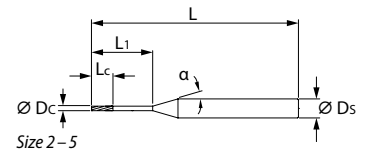
Application: Due to the special hard geometry ideal for use on hardened materials from 60 HRC to 70 HRC.



Ground recess



20 6323



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	N						
20 6323										150	110	90	80										

$\varnothing D_c / R_1$	11X 20 6323	L_c	R_1	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z	f_z
	Solid carbide torus cutter								
	HPC								
	TiAlN								
mm		mm	mm	mm	mm	mm	mm	mm	mm
2/0,2	eShop	2	0.2	10	1.9	58	6	0.005	0.005
2/0,5	eShop	2	0.5	10	1.9	58	6	0.005	0.005
3/0,3	eShop	3	0.3	14	2.9	58	6	0.019	0.019
3/0,5	eShop	3	0.5	14	2.9	58	6	0.019	0.019
4/0,5	eShop	4	0.5	16	3.9	58	6	0.019	0.019
5/0,5	eShop	5	0.5	16	4.9	58	6	0.048	0.048
6/0,5	eShop	6	0.5	18	5.85	58	6	0.048	0.048
6/1,0	eShop	6	1	18	5.85	58	6	0.048	0.048
8/0,5	eShop	8	0.5	24	7.85	64	8	0.06	0.06
8/1,0	eShop	8	1	24	7.85	64	8	0.06	0.06
10/0,5	eShop	10	0.5	30	9.7	73	10	0.07	0.07
10/1,0	eShop	10	1	30	9.7	73	10	0.07	0.07
12/1,0	eShop	12	1	26	11.7	74	12	0.08	0.08
12/2,0	eShop	12	2	26	11.7	74	12	0.08	0.08



GARANT Solid carbide torus cutter HPC

GARANT Diabolo 70:

Special solid carbide substrate with extremely high tensile strength combined with outstanding wear resistance for optimum process reliability.

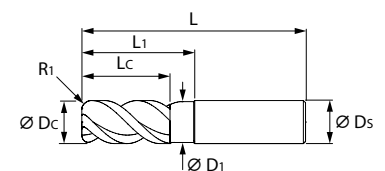
Newly developed nano-crystalline high-tech coating for hard milling up to 70 HRC. Very suitable for continuous use in tool and mould making.

Tolerances:

■ Corner radius: $R_1 = \pm 0.02$ mm.

Application: Due to the special hard geometry ideal for use on hardened materials from 60 HRC to 70 HRC.

For profile milling as a finishing operation.
(Plunge milling only to shallow depths).



Ground recess



20 6324

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast < 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
20 6324										150	110	90	80										

$\varnothing D_c / R_1$	11X 20 6324	L_c	R_1	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z	f_z
	Solid carbide torus cutter								
	HPC								
	TiAlN								
mm		mm	mm	mm	mm	mm	mm	mm	mm
6/0,5	eShop	6	0.5	18	5.85	50	6	0.048	0.048
8/0,5	eShop	8	0.5	24	7.85	60	8	0.06	0.06
10/1,0	eShop	10	1	30	9.7	70	10	0.07	0.07
12/1,0	eShop	12	1	36	11.7	75	12	0.08	0.08



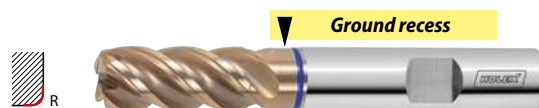
HOLEX Pro INOX M solid carbide torus cutters HPC

Outstanding tool life in its class for machining **corrosion-resistant steels** thanks to **innovative coating and geometry**.

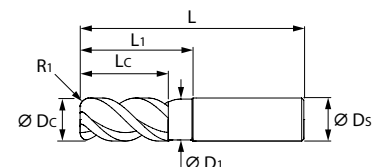
Especially for **stainless steels in the high-performance range**, e.g. duplex.

Optimal metal removal rate due to **high cutting speeds**.

Tolerance: corner radius $R_1 = \pm 0.005 \text{ mm}$. Dimensions similar to DIN 6527.



20 6344



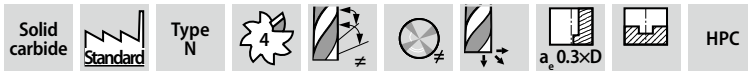
Suitable for/ v _c [m/min]	Alu plastics 	Alu cast > 10 % Si 	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	TOOLOX [®] 33 HRC	TOOLOX [®] 44 HRC	INOX < 900 N	INOX > 900 N	Uni						
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	H	H	M	M							
20 6344				240	220	180	180	150					115	80	100	85	○		●	●	○	○	○

$\varnothing D_c / R_1$	12Y	20 6344	L_c	R_1	L_1	$\varnothing D_1$	L	$\varnothing D_s$	INOX > 900 N f_z	INOX > 900 N f_z
		HOLEX Pro Inox M solid carbide torus cutter								
		HPC TISIN								
mm			mm	mm	mm	mm	mm	mm	mm	mm
4/0,5		eShop	11	0.5	17	3.8	57	6	0.015	0.019
4/1,0		eShop	11	1	17	3.8	57	6	0.015	0.019
5/0,5		eShop	13	0.5	19	4.8	57	6	0.03	0.035
5/1,0		eShop	13	1	19	4.8	57	6	0.03	0.035
6/0,5		eShop	13	0.5	19	5.8	57	6	0.04	0.045
6/1,0		eShop	13	1	19	5.8	57	6	0.04	0.045
6/1,5		eShop	13	1.5	19	5.8	57	6	0.04	0.045
8/0,5		eShop	21	0.5	25	7.7	63	8	0.05	0.058
8/1,0		eShop	21	1	25	7.7	63	8	0.05	0.058
8/2,0		eShop	21	2	25	7.7	63	8	0.05	0.058
10/0,5		eShop	22	0.5	30	9.7	72	10	0.055	0.063
10/1,0		eShop	22	1	30	9.7	72	10	0.055	0.063
10/2,0		eShop	22	2	30	9.7	72	10	0.055	0.063
12/0,5		eShop	26	0.5	36	11.6	83	12	0.06	0.072
12/1,0		eShop	26	1	36	11.6	83	12	0.06	0.072
12/2,0		eShop	26	2	36	11.6	83	12	0.06	0.072
12/3,0		eShop	26	3	36	11.6	83	12	0.06	0.072
16/2,0		eShop	36	2	42	15.5	92	16	0.08	0.09

- Quick application-related tool selection.
- Direct ordering in the eShop.
- Manufacturer and standard-related tool selection.
- Cutting data - direct selection.
- Tool information for reliable engineering.

You can find optimum cutting data, machining strategy and NC programs for your machine programming in the ThreadScout.





GARANT Master INOX / HOLEX Pro INOX solid carbide torus cutter HPC

Dimensions similar to DIN 6527.

HPC milling cutter with **newly developed high-performance coating**.

For **outstanding tool life** and **optimum metal removal rate** in a very wide range of stainless steels.

20 6348 – For use at **high cutting speeds**, particularly suitable even for steels up to approx. 1100 N/mm².

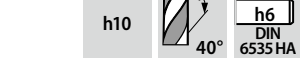
20 6345/6347 – Can be used at **high cutting speeds**, particularly suitable even for TOOLOX®.

Advantage:

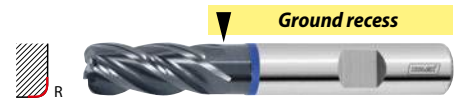
20 6345/6347 – **Greater oxidation resistance and high-temperature hardness.**



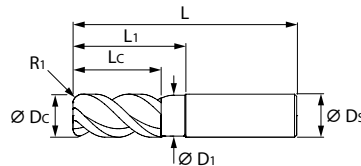
20 6345



20 6347



20 6348



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	H	M	M						
20 6345/6347				250	230	200	180	170						115	80	110	90	○	●	●	○	○	○
20 6348				240	220	180	180	150						115	80	100	85	○	●	●	○	○	○

Ø D _c / R ₁	11X 20 6345	11X 20 6347	12X 20 6348	L _c		R ₁	L ₁		Ø D ₁		L	Ø D _s	f _t	
	Garant		HOLEX										INOX > 900 N	INOX > 900 N
	HPC DIN 6535 HA	HPC DIN 6535 HB	HPC DIN 6535 HB	20 6345 20 6347	20 6348		20 6345 20 6347	20 6348	20 6345 20 6347	20 6348			f _t	f _t
mm	TiAlN	TiAlN	AlCrN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3/0,3	eShop	eShop	—	8	—	0.3	14	—	2.9	—	57	6	0.015	0.018
3/0,5	eShop	eShop	—	8	—	0.5	14	—	2.9	—	57	6	0.015	0.018
4/0,4	eShop	eShop	eShop	11	11	0.4	16	17	3.6	3.8	57	6	0.02	0.025
4/0,5	eShop	eShop	eShop	11	11	0.5	16	17	3.6	3.8	57	6	0.02	0.025
4/1,0	eShop	eShop	eShop	11	11	1	16	17	3.6	3.8	57	6	0.02	0.025
5/0,5	eShop	eShop	eShop	13	13	0.5	18	19	4.6	4.8	57	6	0.025	0.031
5/1,0	eShop	eShop	eShop	13	13	1	18	19	4.6	4.8	57	6	0.025	0.031
6/0,5	eShop	eShop	eShop	13	13	0.5	21	19	5.5	5.8	57	6	0.03	0.037
6/1,0	eShop	eShop	eShop	13	13	1	21	19	5.5	5.8	57	6	0.03	0.037
6/1,5	eShop	eShop	eShop	13	13	1.5	21	19	5.5	5.8	57	6	0.03	0.037
8/0,5	eShop	eShop	eShop	16	21	0.5	27	25	7.5	7.7	63	8	0.035	0.043
8/1,0	eShop	eShop	eShop	16	21	1	27	25	7.5	7.7	63	8	0.035	0.043
8/1,5	eShop	eShop	eShop	16	21	1.5	27	25	7.5	7.7	63	8	0.035	0.043
8/2,0	eShop	eShop	eShop	16	21	2	27	25	7.5	7.7	63	8	0.035	0.043
8/2,5	eShop	eShop	eShop	16	21	2.5	27	25	7.5	7.7	63	8	0.035	0.043
8/3,0	eShop	eShop	eShop	16	21	3	27	25	7.5	7.7	63	8	0.035	0.043
10/0,5	eShop	eShop	eShop	22	22	0.5	32	30	9.5	9.7	72	10	0.04	0.049
10/1,0	eShop	eShop	eShop	22	22	1	32	30	9.5	9.7	72	10	0.04	0.049
10/1,5	eShop	eShop	eShop	22	22	1.5	32	30	9.5	9.7	72	10	0.04	0.049
10/2,0	eShop	eShop	eShop	22	22	2	32	30	9.5	9.7	72	10	0.04	0.049
10/2,5	eShop	eShop	eShop	22	22	2.5	32	30	9.5	9.7	72	10	0.04	0.049
10/3,0	eShop	eShop	eShop	22	22	3	32	30	9.5	9.7	72	10	0.04	0.049
12/0,5	eShop	eShop	eShop	26	26	0.5	38	36	11.5	11.6	83	12	0.05	0.062
12/1,0	eShop	eShop	eShop	26	26	1	38	36	11.5	11.6	83	12	0.05	0.062
12/1,5	eShop	eShop	eShop	26	26	1.5	38	36	11.5	11.6	83	12	0.05	0.062
12/2,0	eShop	eShop	eShop	26	26	2	38	36	11.5	11.6	83	12	0.05	0.062
12/2,5	eShop	eShop	eShop	26	26	2.5	38	36	11.5	11.6	83	12	0.05	0.062
12/3,0	eShop	eShop	eShop	26	26	3	38	36	11.5	11.6	83	12	0.05	0.062
12/4,0	eShop	eShop	eShop	26	26	4	38	36	11.5	11.6	83	12	0.05	0.062
16/0,5	eShop	eShop	eShop	32	36	0.5	44	42	15	15.5	92	16	0.07	0.086
16/1,0	eShop	eShop	eShop	32	36	1	44	42	15	15.5	92	16	0.07	0.086
16/2,0	eShop	eShop	eShop	32	36	2	44	42	15	15.5	92	16	0.07	0.086
16/2,5	eShop	eShop	eShop	32	36	2.5	44	42	15	15.5	92	16	0.07	0.086
16/3,0	eShop	eShop	eShop	32	36	3	44	42	15	15.5	92	16	0.07	0.086
16/4,0	eShop	eShop	eShop	32	36	4	44	42	15	15.5	92	16	0.07	0.086
20/1,0	eShop	eShop	eShop	38	41	1	54	52	19	19.5	104	20	0.09	0.111
20/2,0	eShop	eShop	eShop	38	41	2	54	52	19	19.5	104	20	0.09	0.111
20/3,0	eShop	eShop	eShop	38	41	3	54	52	19	19.5	104	20	0.09	0.111
20/4,0	eShop	eShop	eShop	38	41	4	54	52	19	19.5	104	20	0.09	0.111



Solid carbide torus cutter HPC

20 6351 – Dimensions to DIN 6527 and 38° flutes.

Tolerance: Corner radius $R_1 = \pm 0.005$ mm.

20 6353 – Dimensions to factory standard and 35° spiral.

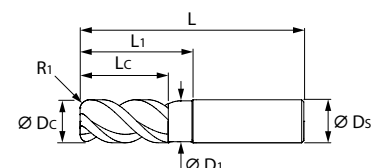
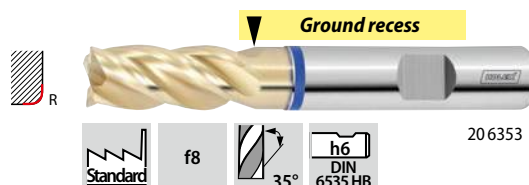
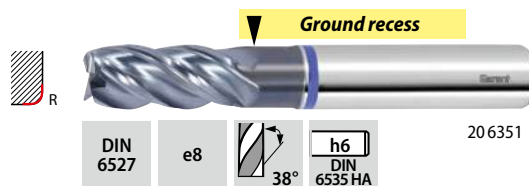
Special TiSi coating.

With balancing speed G 2.5.

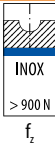
Note: **NEW GENERATION AVAILABLE!**

20 6351 – **Recommended successor product is No. 206345**

20 6353 – **Recommended successor product is No. 206348**



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S						
20 6351				250	230	200	180	170					115	80	90	80	50	○		●	●	○	○
20 6353				250	230	200	180	170					115	80	90	80		○		●	●	○	○

Ø D _c / R ₁	11X 20 6351 Garant	12X 20 6353 HOLEX	L _c		R ₁	L ₁		Ø D ₁		L	Ø D _s	 INOX > 900 N f _z	 INOX > 900 N f _z
	Solid carbide torus cutter												
	HPC DIN 6535 HA	HPC DIN 6535 HB	20 6351	20 6353		20 6351	20 6353	20 6351	20 6353				
mm	TiAlN	TiSi	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4/0,4	eShop	—	12	—	0.4	16	—	3.6	—	57	6	0.016	0.02
4/0,5	eShop	eShop	12	11	0.5	16	17	3.6	3.8	57	6	0.014	0.018
4/1,0	eShop	—	12	—	1	16	—	3.6	—	57	6	0.013	0.016
5/0,5	eShop	—	13	—	0.5	18	—	4.6	—	57	6	0.026	0.032
5/1,0	eShop	eShop	13	13	1	18	19	4.6	4.8	57	6	0.023	0.03
6/0,5	eShop	eShop	13	13	0.5	21	19	5.5	5.8	57	6	0.033	0.04
6/1,0	eShop	eShop	13	13	1	21	19	5.5	5.8	57	6	0.03	0.037
6/1,5	eShop	—	13	—	1.5	21	—	5.5	—	57	6	0.026	0.032
8/0,5	eShop	eShop	16	21	0.5	27	25	7.5	7.7	63	8	0.04	0.048
8/1,0	eShop	eShop	16	21	1	27	25	7.5	7.7	63	8	0.035	0.043
8/1,5	eShop	—	16	—	1.5	27	—	7.5	—	63	8	0.03	0.037
8/2,0	eShop	—	16	—	2	27	—	7.5	—	63	8	0.026	0.032
8/2,5	eShop	—	16	—	2.5	27	—	7.5	—	63	8	0.024	0.03
8/3,0	eShop	—	16	—	3	27	—	7.5	—	63	8	0.022	0.028
10/0,5	eShop	eShop	22	22	0.5	32	30	9.5	9.7	72	10	0.052	0.064
10/1,0	eShop	eShop	22	22	1	32	30	9.5	9.7	72	10	0.048	0.06
10/1,5	eShop	—	22	—	1.5	32	—	9.5	—	72	10	0.043	0.053
10/2,0	eShop	eShop	22	22	2	32	30	9.5	9.7	72	10	0.04	0.048
10/2,5	eShop	—	22	—	2.5	32	—	9.5	—	72	10	0.037	0.044
10/3,0	eShop	—	22	—	3	32	—	9.5	—	72	10	0.035	0.04
12/0,5	eShop	eShop	26	26	0.5	38	36	11.5	11.6	83	12	0.065	0.08
12/1,0	eShop	eShop	26	26	1	38	36	11.5	11.6	83	12	0.06	0.075
12/1,5	eShop	—	26	—	1.5	38	—	11.5	—	83	12	0.058	0.072
12/2,0	eShop	eShop	26	26	2	38	36	11.5	11.6	83	12	0.056	0.07
12/2,5	eShop	—	26	—	2.5	38	—	11.5	—	83	12	0.055	0.068
12/3,0	eShop	—	26	—	3	38	—	11.5	—	83	12	0.054	0.066
12/4,0	eShop	eShop	26	26	4	38	36	11.5	11.6	83	12	0.052	0.064
16/0,5	eShop	—	32	—	0.5	44	—	15	—	92	16	0.078	0.096
16/1,0	eShop	eShop	32	36	1	44	42	15	15.5	92	16	0.078	0.096
16/2,0	eShop	eShop	32	36	2	44	42	15	15.5	92	16	0.072	0.088
16/2,5	eShop	—	32	—	2.5	44	—	15	—	92	16	0.07	0.085
16/3,0	eShop	—	32	—	3	44	—	15	—	92	16	0.067	0.083
16/4,0	eShop	eShop	32	36	4	44	42	15	15.5	92	16	0.065	0.08
20/1,0	eShop	eShop	38	41	1	55	52	19	19.5	104	20	0.09	0.13
20/2,0	eShop	eShop	38	41	2	55	52	19	19.5	104	20	0.085	0.105
20/3,0	eShop	—	38	—	3	55	—	19	—	104	20	0.082	0.1
20/4,0	eShop	eShop	38	41	4	55	52	19	19.5	104	20	0.078	0.096



GARANT Master Titan solid carbide torus cutter HPC / GARANT Master Ni-Based solid carbide torus cutter HPC

20 6364 – Tolerance: Corner radius $R_1 = \pm 0.005$ mm.

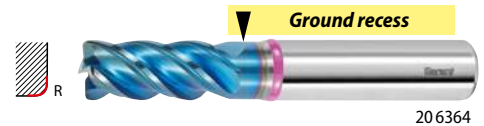
20 6371/6373 – Innovative substrate specially for machining **nickel-based alloys**.
Newly developed coating.

Application:

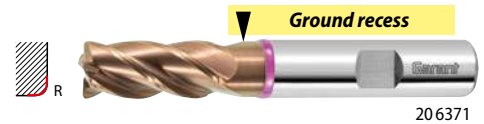
20 6364 – For milling **titanium and titanium alloys**; with very smooth cutting action for optimum tool life and top metal removal rate.

20 6373 – For finishing operations.

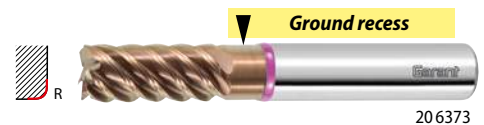
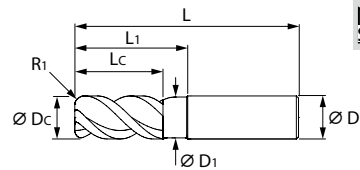
20 6371/6373 – For milling **nickel-based alloys with high red hardness**.



20 6364



20 6371

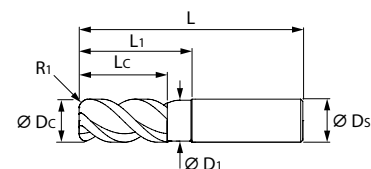


20 6373

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Inconel [®]	Graphite GRP CRP				
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	S	N				
20 6364																60						
20 6371																	40					
20 6373																50						

$\frac{\phi}{D_c / R_1}$	11Z	20 6364	11Z	20 6371	No. of teeth Z	L_c	R_1	L_1	ϕD_1	L	ϕD_s	Ti > 850 N f_z	Inconel [®] f_z	Ti > 850 N f_z
		GARANT Master Titan solid carbide torus cutter		GARANT Master Ni-Based torus cutter								20 6364	20 6371	20 6364
		HPC			20 6364	20 6371	20 6364	20 6371						
mm		TiAlN		TiAlN			mm	mm	mm	mm	mm	mm	mm	mm
4/0,5		eShop		eShop	4	4	11	11	0.5	16	3.8	57	6	0.018
5/1,0		eShop		eShop	4	4	13	13	1	18	4.8	57	6	0.022
6/0,5		eShop		eShop	4	4	13	13	0.5	20	5.8	57	6	0.026
6/1,0		eShop		eShop	4	4	13	13	1	20	5.8	57	6	0.026
8/0,5		eShop		—	4	—	19	—	0.5	25	7.7	63	8	0.034
8/1,0		eShop		eShop	4	4	19	21	1	25	7.7	63	8	0.034
10/0,5		eShop		eShop	4	4	22	22	0.5	32	9.7	72	10	0.042
10/1,0		eShop		eShop	4	4	22	22	1	32	9.7	72	10	0.042
10/2,0		eShop		eShop	4	4	22	22	2	32	9.7	72	10	0.042
12/0,5		eShop		eShop	4	4	26	26	0.5	38	11.6	83	12	0.05
12/1,0		eShop		eShop	4	4	26	26	1	38	11.6	83	12	0.05
12/2,0		eShop		—	4	—	26	—	2	38	11.6	83	12	0.05
12/2,5		eShop		eShop	4	4	26	26	2.5	38	11.6	83	12	0.05
12/3,0		eShop		—	4	—	26	—	3	38	11.6	83	12	0.05
16/1,0		eShop		eShop	4	5	32	36	1	44	15.5	92	16	0.065
16/2,0		eShop		—	4	—	32	—	2	44	15.5	92	16	0.065
16/2,5		eShop		eShop	4	5	32	36	2.5	44	15.5	92	16	0.065
16/3,0		eShop		—	4	—	32	—	3	44	15.5	92	16	0.065
16/4,0		eShop		—	4	—	32	—	4	44	15.5	92	16	0.065
20/1,0		eShop		eShop	4	5	41	41	1	54	19.5	104	20	0.08
20/2,0		eShop		—	4	—	41	—	2	54	19.5	104	20	0.08
20/2,5		eShop		eShop	4	5	41	41	2.5	54	19.5	104	20	0.08

$\frac{\phi}{D_c / R_1}$	11Z	20 6373	No. of teeth Z	L_c	R_1	L_1	ϕD_1	L	ϕD_s	Inconel [®] f_z
		GARANT Master Ni-Based torus cutter								
		HPC								
mm		TiAlN		mm	mm	mm	mm	mm	mm	
6/0,5		eShop	6	19	0.5	25	5.8	63	6	0.03
6/1,0		eShop	6	19	1	25	5.8	63	6	0.03
8/0,5		eShop	6	25	0.5	33	7.8	71	8	0.035
8/1,0		eShop	6	25	1	33	7.8	71	8	0.035
10/0,5		eShop	6	31	0.5	41	9.8	83	10	0.04
10/1,0		eShop	6	31	1	41	9.8	83	10	0.04
12/0,5		eShop	6	37	0.5	47	11.8	94	12	0.05
12/1,0		eShop	6	37	1	47	11.8	94	12	0.05
16/1,0		eShop	8	49	1	61	15.8	111	16	0.06
16/2,0		eShop	8	49	2	61	15.8	111	16	0.06



Ground recess

206354/6359 – Tolerance: Corner radius $R_1 = \pm 0.01 \text{ mm}$.

DIN
6527

f8



206354

Ground recess



fg



20 6359

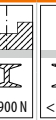
Ground recess

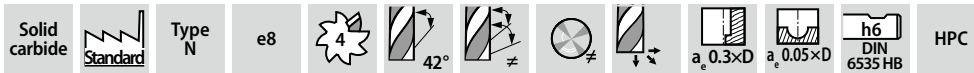


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20 6357

Ø D _c / R _i	11X 20 6354	11X 20 6359	12X 20 6357	L _c		R _i	L _i			Ø D _i			L		Ø D _s						
	Garant		HOLEX																		
	GARANT Master Steel solid carbide torus cutter			HOLEX Pro Steel solid carbide torus cutter	20 6354	20 6357		20 6354	20 6359	20 6357	20 6354	20 6359	20 6357	20 6354	20 6359		f _z	f _z			
	HPC				20 6354	20 6357		20 6354	20 6359	20 6357	20 6354	20 6359	20 6357	20 6354	20 6359	20 6357	20 6354	20 6359		f _z	f _z
mm	TiAIN	TiAIN	TiAIN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4/0,4	eShop	—	—	11	—	0.4	—	—	—	—	—	—	57	—	6	0.02	0.025				
4/0,5	eShop	eShop	eShop	11	11	0.5	—	22	15	—	3.8	3.8	57	62	6	0.02	0.025				
4/1,0	eShop	eShop	eShop	11	11	1	—	22	15	—	3.8	3.8	57	62	6	0.02	0.025				
5/0,5	eShop	eShop	eShop	13	13	0.5	—	24	17	—	4.8	4.8	57	62	6	0.03	0.04				
5/1,0	eShop	eShop	eShop	13	13	1	—	24	17	—	4.8	4.8	57	62	6	0.03	0.04				
6/0,5	eShop	eShop	eShop	13	13	0.5	20	25	21	5.8	5.8	5.5	57	62	6	0.04	0.05				
6/1,0	eShop	eShop	eShop	13	13	1	20	25	21	5.8	5.8	5.5	57	62	6	0.04	0.05				
6/1,5	eShop	—	eShop	13	13	1.5	20	—	21	5.8	—	5.5	57	—	6	0.04	0.05				
6/2,0	eShop	eShop	eShop	13	13	2	20	25	21	5.8	5.8	5.5	57	62	6	0.04	0.05				
8/0,5	eShop	—	eShop	21	19	0.5	25	—	27	7.8	—	7.5	63	—	8	0.05	0.06				
8/1,0	eShop	eShop	eShop	21	19	1	25	30	27	7.8	7.7	7.5	63	68	8	0.05	0.06				
8/1,5	eShop	—	eShop	21	19	1.5	25	—	27	7.8	—	7.5	63	—	8	0.05	0.06				
8/2,0	eShop	eShop	eShop	21	19	2	25	30	27	7.8	7.7	7.5	63	68	8	0.05	0.06				
8/2,5	eShop	—	—	21	—	2.5	25	—	—	7.8	—	—	63	—	8	0.05	0.06				
8/3,0	eShop	—	—	21	—	3	25	—	—	7.8	—	—	63	—	8	0.05	0.06				
10/0,5	eShop	eShop	eShop	22	22	0.5	30	38	32	9.8	9.7	9.5	72	80	10	0.06	0.08				
10/1,0	eShop	eShop	eShop	22	22	1	30	38	32	9.8	9.7	9.5	72	80	10	0.06	0.08				
10/1,5	eShop	eShop	eShop	22	22	1.5	30	38	32	9.8	9.7	9.5	72	80	10	0.06	0.08				
10/2,0	eShop	eShop	eShop	22	22	2	30	38	32	9.8	9.7	9.5	72	80	10	0.06	0.08				
10/2,5	eShop	—	—	22	—	2.5	30	—	—	9.8	—	—	72	—	10	0.06	0.08				
10/3,0	eShop	eShop	—	22	—	3	30	38	—	9.8	9.7	—	72	80	10	0.06	0.08				
12/0,5	eShop	eShop	eShop	26	26	0.5	36	46	38	11.8	11.6	11.5	83	93	12	0.07	0.09				
12/1,0	eShop	eShop	eShop	26	26	1	36	46	38	11.8	11.6	11.5	83	93	12	0.07	0.09				
12/1,5	eShop	eShop	eShop	26	26	1.5	36	46	38	11.8	11.6	11.5	83	93	12	0.07	0.09				
12/2,0	eShop	eShop	eShop	26	26	2	36	46	38	11.8	11.6	11.5	83	93	12	0.07	0.09				
12/2,5	eShop	—	—	26	—	2.5	36	—	—	11.8	—	—	83	—	12	0.07	0.09				
12/3,0	eShop	eShop	eShop	26	26	3	36	46	38	11.8	11.6	11.5	83	93	12	0.07	0.09				
12/4,0	eShop	—	—	26	—	4	36	—	—	11.8	—	—	83	—	12	0.07	0.09				
16/0,5	eShop	eShop	eShop	36	32	0.5	42	58	44	15.8	15.5	15.5	92	108	16	0.08	0.1				
16/1,0	eShop	eShop	eShop	36	32	1	42	58	44	15.8	15.5	15.5	92	108	16	0.08	0.1				
16/2,0	eShop	eShop	eShop	36	32	2	42	58	44	15.8	15.5	15.5	92	108	16	0.08	0.1				
16/2,5	eShop	—	—	36	—	2.5	42	—	—	15.8	—	—	92	—	16	0.08	0.1				
16/3,0	eShop	—	—	36	—	3	42	—	—	15.8	—	—	92	—	16	0.08	0.1				
16/4,0	eShop	eShop	eShop	36	32	4	42	58	44	15.8	15.5	15.5	92	108	16	0.08	0.1				
20/1,0	eShop	eShop	eShop	41	38	1	52	74	54	19.8	19.5	19.5	104	126	20	0.1	0.13				
20/2,0	eShop	eShop	eShop	41	38	2	52	74	54	19.8	19.5	19.5	104	126	20	0.1	0.13				
20/3,0	eShop	—	—	41	—	3	52	—	—	19.8	—	—	104	—	20	0.1	0.13				
20/4,0	eShop	eShop	eShop	41	38	4	52	74	54	19.8	19.5	19.5	104	126	20	0.1	0.13				



GARANT Master Uni solid carbide torus cutter HPC / HOLEX Pro UNI solid carbide torus cutter HPC

For **roughing and finishing at very high feed rates** with smooth cutting action.

Newly developed geometry and high-performance coating for outstanding production results and very long tool life with a variety of materials.

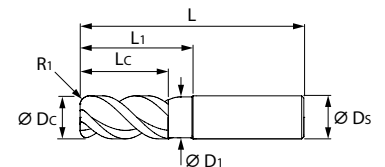
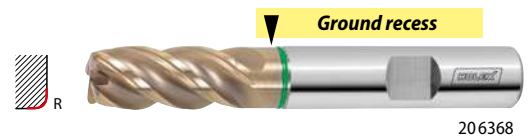
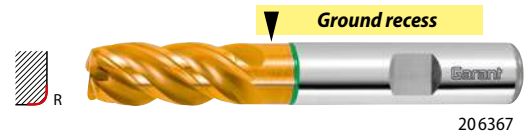
Unequal spacing gives **high intrinsic stability** and smooth cutting action.

Tolerance: corner radius $R_1 = \pm 0.005 \text{ mm}$.

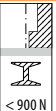
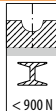
Dimensions similar to **DIN 6527**.

Advantage:

- 20 6367 – ■ Particularly low vibration running.
- Special flute profile, large flutes.
- Specially matched edge honing.
- Optimised substrate for hardness and toughness.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K					
20 6367		280		260	240	190	180	150						90	80	40	250	●	●	○	●	●
20 6368		250		240	220	180	170	140						90	80	35	240	●	●	○	●	●

Ø D _c / R ₁	11Z	20 6367	12Z	20 6368	L _c	R ₁	L ₁		Ø D ₁	L	Ø D _s				
		Garant		HOLEX			20 6367	20 6368				f _z	f _z	f _z	f _z
mm		TiSiN		TiSiN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4/0,5		eShop		eShop	11	0.5	17	17	3.8	57	6	0.025	0.015	0.03	0.19
4/1,0		eShop		eShop	11	1	17	17	3.8	57	6	0.025	0.015	0.03	0.19
5/0,5		eShop		—	13	0.5	19	—	4.8	57	6	0.04	0.03	0.045	0.035
5/1,0		eShop		—	13	1	19	—	4.8	57	6	0.04	0.03	0.045	0.035
6/0,5		eShop		eShop	13	0.5	21	19	5.8	57	6	0.05	0.035	0.058	0.04
6/1,0		eShop		eShop	13	1	21	19	5.8	57	6	0.05	0.035	0.058	0.04
6/1,5		eShop		—	13	1.5	21	—	5.8	57	6	0.05	0.035	0.058	0.04
6/2,0		eShop		eShop	13	2	21	19	5.8	57	6	0.05	0.035	0.058	0.04
8/0,5		eShop		eShop	21	0.5	27	25	7.7	63	8	0.06	0.04	0.07	0.045
8/1,0		eShop		eShop	21	1	27	25	7.7	63	8	0.06	0.04	0.07	0.045
8/1,5		eShop		—	21	1.5	27	—	7.7	63	8	0.06	0.04	0.07	0.045
8/2,0		eShop		eShop	21	2	27	25	7.7	63	8	0.06	0.04	0.07	0.045
8/2,5		eShop		—	21	2.5	27	—	7.7	63	8	0.06	0.04	0.07	0.045
8/3,0		eShop		—	21	3	27	—	7.7	63	8	0.06	0.04	0.07	0.045
10/0,5		eShop		eShop	22	0.5	32	30	9.7	72	10	0.08	0.05	0.09	0.058
10/1,0		eShop		eShop	22	1	32	30	9.7	72	10	0.08	0.05	0.09	0.058
10/1,5		eShop		—	22	1.5	32	—	9.7	72	10	0.08	0.05	0.09	0.058
10/2,0		eShop		eShop	22	2	32	30	9.7	72	10	0.08	0.05	0.09	0.058
10/3,0		eShop		—	22	3	32	—	9.7	72	10	0.08	0.05	0.09	0.058
12/0,5		eShop		eShop	26	0.5	38	36	11.6	83	12	0.09	0.055	0.11	0.067
12/1,0		eShop		eShop	26	1	38	36	11.6	83	12	0.09	0.055	0.11	0.067
12/1,5		eShop		—	26	1.5	38	—	11.6	83	12	0.09	0.055	0.11	0.067
12/2,0		eShop		eShop	26	2	38	36	11.6	83	12	0.09	0.055	0.11	0.067
12/3,0		eShop		eShop	26	3	38	36	11.6	83	12	0.09	0.055	0.11	0.067
12/4,0		eShop		—	26	4	38	—	11.6	83	12	0.09	0.055	0.11	0.067
16/0,5		eShop		—	36	0.5	44	—	15.5	92	16	0.1	0.06	0.125	0.075
16/1,0		eShop		—	36	1	44	—	15.5	92	16	0.1	0.06	0.125	0.075
16/2,0		eShop		eShop	36	2	44	42	15.5	92	16	0.1	0.06	0.125	0.075

Solid carbide	Type H	e8			HPC
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GARANT Diabolo solid carbide torus cutter HRC 62 / GARANT Diabolo solid carbide torus cutter HPC

GARANT Diabolo:

Special geometry, coating and carbide for hard machining.

Tolerance: Corner radius $R_1 = \pm 0.005$ mm.

20 6421/6372 – Without dynamic twist pitch.

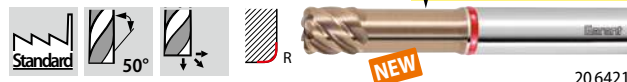
20 6372 – Dimensions according to factory standard and 50° helix.
Double relief ground side clearance angle.

20 6421 – Dimensions according to factory standard and 50° helix.
Double relief ground side clearance angle.

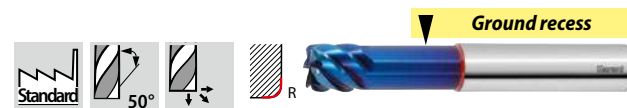
20 6422/6442 – Tolerance: Corner radius $RS_1 = \pm 0.005$ mm.

Application:

20 6422/6442 – For peripheral milling as a finishing operation
(plunge milling only to shallow depths).



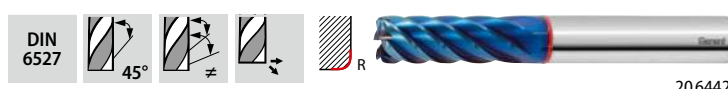
20 6421



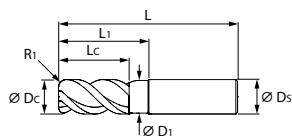
20 6372



20 6422



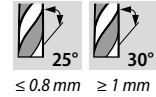
20 6442



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si												INOX	INOX	Ti	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
20 6372									200	190	170	150	110										
20 6421									170	150	130	100	80	65									
20 6422									170	170	170	145	100										
20 6442									150	150	150	125	80										

Ø e8 D _c / R ₁	11X	20 6421	11X	20 6372	No. of teeth Z	L _c	R ₁	L ₁	Ø D ₁	L	Ø D _s			
		GARANT Diabolo solid carbide torus cutter HRC 62		GARANT Diabolo solid carbide torus cutter								f _z	f _z	f _z
		HPC										20 6421	20 6421	
mm		TiSiN		TiAlN		mm	mm	mm	mm	mm	mm	mm	mm	mm
6/0,5		eShop		eShop	6	7	0.5	21	5.5	57	6	0.035	0.05	0.048
6/0,8		—		eShop	6	7	0.8	21	5.5	57	6	—	—	0.048
6/1,0		eShop		eShop	6	7	1	21	5.5	57	6	0.035	0.05	0.048
6/1,5		eShop		eShop	6	7	1.5	21	5.5	57	6	0.035	0.05	0.048
8/0,5		eShop		eShop	6	9	0.5	27	7.4	63	8	0.04	0.06	0.06
8/0,8		—		eShop	6	9	0.8	27	7.4	63	8	—	—	0.06
8/1,0		eShop		eShop	6	9	1	27	7.4	63	8	0.04	0.06	0.06
8/1,5		eShop		eShop	6	9	1.5	27	7.4	63	8	0.04	0.06	0.06
8/2,0		eShop		eShop	6	9	2	27	7.4	63	8	0.04	0.06	0.06
8/3,0		—		eShop	6	9	3	27	7.4	63	8	—	—	0.06
10/0,5		eShop		eShop	6	11	0.5	32	9.2	72	10	0.045	0.07	0.07
10/0,8		—		eShop	6	11	0.8	32	9.2	72	10	—	—	0.07
10/1,0		eShop		eShop	6	11	1	32	9.2	72	10	0.045	0.07	0.07
10/1,5		—		eShop	6	11	1.5	32	9.2	72	10	—	—	0.07
10/2,0		eShop		eShop	6	11	2	32	9.2	72	10	0.045	0.07	0.07
10/3,0		—		eShop	6	11	3	32	9.2	72	10	—	—	0.07
12/0,5		eShop		eShop	6	12	0.5	38	11	83	12	0.05	0.075	0.08
12/1,0		eShop		eShop	6	12	1	38	11	83	12	0.05	0.075	0.08
12/1,5		—		eShop	6	12	1.5	38	11	83	12	—	—	0.08
12/2,0		eShop		eShop	6	12	2	38	11	83	12	0.05	0.075	0.08
12/3,0		—		eShop	6	12	3	38	11	83	12	—	—	0.08
16/2,0		eShop		eShop	6	16	2	44	15	92	16	0.06	0.085	0.09
16/3,0		—		eShop	6	16	3	44	15	92	16	—	—	0.09

Ø e8 D _c / R ₁	11X	20 6422	11X	20 6442	No. of teeth Z	L _c	R ₁	L	Ø D _s	
		GARANT Diabolo solid carbide torus cutter								f _z
		HPC								
mm		TiAlN		TiAlN		mm	mm	mm	mm	mm
6/0,5		eShop		eShop	6	16	18	0.5	57	65
6/1,0		eShop		eShop	6	16	18	1	57	65
8/0,5		eShop		eShop	6	19	24	0.5	63	70
8/1,0		eShop		eShop	6	19	24	1	63	70
10/0,5		eShop		eShop	6	25	30	0.5	72	85
10/1,0		eShop		eShop	6	25	30	1	72	85
10/1,5		eShop		eShop	6	25	30	1.5	72	85
12/0,5		eShop		eShop	6	28	36	0.5	83	93
12/1,0		eShop		eShop	6	28	36	1	83	93
12/1,5		eShop		—	6	28	—	1.5	83	—
16/1,0		eShop		eShop	8	36	48	1	92	110
16/2,0		eShop		eShop	8	36	48	2	92	110
20/1,0		eShop		eShop	10	41	60	1	104	126



Garant Solid carbide micro precision copy slot drill

With **advanced DLC sp² coating**. For the **highest demands regarding performance and precision in aluminium materials**. **Extremely tight tolerances** ensure maximum accuracy. Double-relief ground with 2 chamfers.

Tolerances:

■ Corner radius: **Radius contour = 0 / -0.005 mm.**

■ Neck $\varnothing$: **$D_1 = 0 / -0.01$ mm.**

20 7023 – Recess angle $\alpha = 16^\circ$.

20 7025 – Recess angle $\alpha = 16^\circ$.

Extra-sturdy shank to reduce the tendency to vibrate.

Note:

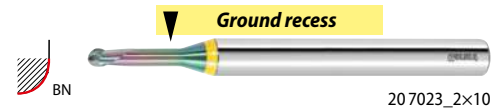
At greater tool overhang lengths, use a reduced value for a_p !

values for:

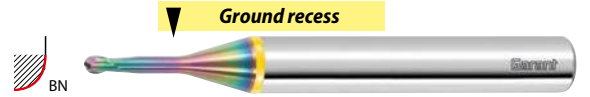
copying: $a_p = 0.25 \times D \times a_{p, \text{corr}}$

To calculate the feed rate v_f please use the actual speed of the machine (the maximum possible speed)!

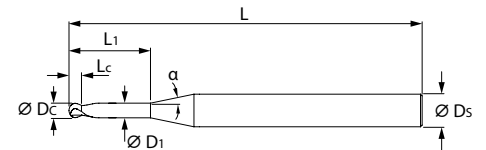
e.g. $v_f = 18000 \text{ [rpm]} \times f_z \text{ [mm/Z]} \times z$



20 7023_2x10



20 7025_2x10



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 7023/2025	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200					

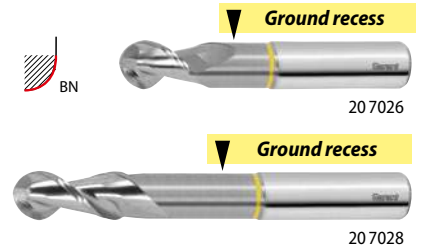
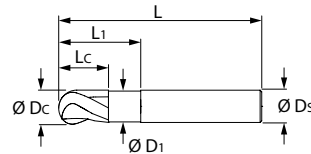
$\varnothing D_c \times L_1$	11X	20 7023	11X	20 7025	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$		Correction factor $a_{p, \text{corr}}$
		Solid carbide copy slot drill									
		DLC		DLC							
mm					mm	mm	mm	mm	mm	mm	
0,1x0,3		eShop		—	0.08	0.3	0.08	45	—	4	1
0,1x0,5		eShop		—	0.08	0.5	0.08	45	—	4	1
0,1x1		eShop		—	0.08	1	0.08	45	—	4	0.5
0,2x0,5		eShop		—	0.16	0.5	0.17	45	—	4	1
0,2x1		eShop		—	0.16	1	0.17	45	—	4	1
0,2x2		eShop		—	0.16	2	0.17	45	—	4	0.5
0,2x3		eShop		—	0.16	3	0.17	45	—	4	0.2
0,3x0,5		eShop		—	0.24	0.5	0.27	45	—	4	1
0,3x1		eShop		—	0.24	1	0.27	45	—	4	1
0,3x2		eShop		—	0.24	2	0.27	45	—	4	0.9
0,3x3		eShop		—	0.24	3	0.27	45	—	4	0.5
0,3x4		eShop		—	0.24	4	0.27	45	—	4	0.35
0,3x6		eShop		—	0.24	6	0.27	45	—	4	0.08
0,4x1		eShop		—	0.32	1	0.37	45	—	4	1
0,4x2		eShop		—	0.32	2	0.37	45	—	4	1
0,4x3		eShop		—	0.32	3	0.37	45	—	4	0.8
0,4x4		eShop		—	0.32	4	0.37	45	—	4	0.5
0,4x6		eShop		—	0.32	6	0.37	45	—	4	0.2
0,4x8		eShop		—	0.32	8	0.37	45	—	4	0.08
0,5x1		eShop		eShop	0.4	1	0.47	45	55	4	1
0,5x2		eShop		—	0.4	2	0.47	45	—	4	1
0,5x3		eShop		eShop	0.4	3	0.47	45	55	4	0.9
0,5x4		eShop		—	0.4	4	0.47	45	—	4	0.8
0,5x6		eShop		—	0.4	6	0.47	45	—	4	0.35
0,5x8		eShop		—	0.4	8	0.47	45	—	4	0.12
0,5x10		eShop		—	0.4	10	0.47	50	—	4	0.08
0,6x2		eShop		eShop	0.48	2	0.57	45	55	4	1
0,6x3		eShop		—	0.48	3	0.57	45	—	4	1
0,6x4		eShop		—	0.48	4	0.57	45	—	4	0.9
0,6x6		eShop		eShop	0.48	6	0.57	45	55	4	0.5
0,6x8		eShop		—	0.48	8	0.57	45	—	4	0.35
0,6x10		eShop		—	0.48	10	0.57	50	—	4	0.12
0,8x2		eShop		eShop	0.64	2	0.77	45	55	4	1
0,8x3		eShop		—	0.64	3	0.77	45	—	4	1
0,8x4		eShop		—	0.64	4	0.77	45	—	4	1
0,8x6		eShop		—	0.64	6	0.77	45	—	4	0.8
0,8x8		eShop		—	0.64	8	0.77	45	—	4	0.5

Ø D _c × L ₁	11X	20 7023	11X	20 7025	L _c	L ₁	Ø D ₁	L		Ø D _s			Correction factor a _{p corr}
	Solid carbide copy slot drill												
	mm	DLC	DLC	mm				mm	mm	20 7023	20 7025	20 7023	
0,8×10	eShop	—	0.64	10	0.77	50	—	4	—	0.016	—	0.35	
0,8×12	eShop	—	0.64	12	0.77	50	—	4	—	0.016	—	0.2	
1×2	eShop	eShop	0.8	2	0.96	45	55	4	6	0.03	0.036	1	
1×2,5	eShop	—	0.8	2.5	0.96	45	—	4	—	0.03	—	1	
1×3	eShop	—	0.8	3	0.96	45	—	4	—	0.03	—	1	
1×4	eShop	eShop	0.8	4	0.96	45	55	4	6	0.03	0.036	1	
1×5	eShop	eShop 	0.8	5	0.96	45	55	4	6	0.03	0.036	1	
1×6	eShop	eShop	0.8	6	0.96	45	55	4	6	0.03	0.036	0.9	
1×8	eShop	eShop	0.8	8	0.96	45	55	4	6	0.03	0.036	0.8	
1×10	eShop	eShop	0.8	10	0.96	50	55	4	6	0.03	0.036	0.5	
1×12	eShop	eShop	0.8	12	0.96	50	55	4	6	0.025	0.03	0.35	
1×15	eShop	eShop	0.8	15	0.96	50	55	4	6	0.025	0.03	0.2	
1×16	eShop	—	0.8	16	0.96	50	—	4	—	0.025	—	0.2	
1×20	eShop	eShop	0.8	20	0.96	60	57	4	6	0.02	0.024	0.08	
1×25	eShop	—	0.8	25	0.96	60	—	4	—	0.02	—	0.04	
1×30	eShop	—	0.8	30	0.96	70	—	4	—	0.016	—	0.02	
1,2×3	eShop	—	0.96	3	1.16	45	—	4	—	0.03	—	1	
1,2×4	eShop	—	0.96	4	1.16	45	—	4	—	0.03	—	1	
1,2×6	eShop	—	0.96	6	1.16	45	—	4	—	0.03	—	1	
1,2×8	eShop	—	0.96	8	1.16	45	—	4	—	0.03	—	0.9	
1,2×10	eShop	—	0.96	10	1.16	45	—	4	—	0.03	—	0.8	
1,2×12	eShop	—	0.96	12	1.16	50	—	4	—	0.025	—	0.5	
1,2×15	eShop	—	0.96	15	1.16	55	—	4	—	0.025	—	0.35	
1,2×20	eShop	—	0.96	20	1.16	55	—	4	—	0.02	—	0.12	
1,5×3	eShop	—	1.2	3	1.44	45	—	4	—	0.03	—	1	
1,5×4	eShop	—	1.2	4	1.44	45	—	4	—	0.03	—	1	
1,5×6	eShop	eShop 	1.2	6	1.44	45	55	4	6	0.03	0.036	1	
1,5×8	eShop	—	1.2	8	1.44	45	—	4	—	0.03	—	1	
1,5×10	eShop	eShop	1.2	10	1.44	45	55	4	6	0.03	0.036	0.9	
1,5×12	eShop	eShop	1.2	12	1.44	50	55	4	6	0.03	0.036	0.8	
1,5×15	eShop	eShop	1.2	15	1.44	50	55	4	6	0.025	0.03	0.5	
1,5×16	eShop	—	1.2	16	1.44	50	—	4	—	0.025	—	0.4	
1,5×20	eShop	—	1.2	20	1.44	60	—	4	—	0.025	—	0.35	
1,5×25	eShop	—	1.2	25	1.44	60	—	4	—	0.025	—	0.12	
1,5×30	eShop	—	1.2	30	1.44	70	—	4	—	0.02	—	0.08	
1,8×8	eShop	—	1.44	8	1.74	45	—	4	—	0.035	—	1	
1,8×10	eShop	—	1.44	10	1.74	45	—	4	—	0.035	—	0.9	
1,8×12	eShop	—	1.44	12	1.74	50	—	4	—	0.035	—	0.9	
1,8×15	eShop	—	1.44	15	1.74	50	—	4	—	0.03	—	0.8	
1,8×20	eShop	—	1.44	20	1.74	55	—	4	—	0.03	—	0.5	
2×3	eShop	—	1.6	3	1.94	45	—	4	—	0.04	—	1	
2×4	eShop	—	1.6	4	1.94	45	—	4	—	0.035	—	1	
2×6	eShop	eShop	1.6	6	1.94	45	55	4	6	0.035	0.04	1	
2×8	eShop	eShop	1.6	8	1.94	45	55	4	6	0.035	0.04	1	
2×10	eShop	eShop 	1.6	10	1.94	45	55	4	6	0.035	0.04	1	
2×12	eShop	eShop	1.6	12	1.94	50	55	4	6	0.035	0.04	0.9	
2×14	eShop	—	1.6	14	1.94	50	—	4	—	0.035	—	0.9	
2×15	eShop	eShop	1.6	15	1.94	50	55	4	6	0.035	0.04	0.8	
2×16	eShop	eShop	1.6	16	1.94	50	55	4	6	0.035	0.04	0.8	
2×20	eShop	eShop	1.6	20	1.94	60	57	4	6	0.03	0.036	0.5	
2×25	eShop	eShop	1.6	25	1.94	60	65	4	6	0.03	0.036	0.35	
2×30	eShop	—	1.6	30	1.94	70	—	4	—	0.03	—	0.2	
2×35	eShop	—	1.6	35	1.94	80	—	4	—	0.025	—	0.08	
2×40	eShop	—	1.6	40	1.94	80	—	4	—	0.025	—	0.04	
2,5×15	eShop 	—	2	15	2.41	50	—	4	—	0.035	—	0.9	
2,5×20	eShop	—	2	20	2.41	55	—	4	—	0.035	—	0.8	
2,5×25	eShop	—	2	25	2.41	60	—	4	—	0.03	—	0.5	
2,5×30	eShop	—	2	30	2.41	70	—	4	—	0.03	—	0.35	
3×6	eShop	—	3.5	6	2.92	45	—	4	—	0.035	—	1	
3×8	eShop	—	3.5	8	2.92	45	—	4	—	0.035	—	1	
3×10	eShop	—	3.5	10	2.92	45	—	4	—	0.035	—	1	
3×12	eShop	—	3.5	12	2.92	45	—	4	—	0.035	—	1	
3×15	eShop	—	3.5	15	2.92	50	—	4	—	0.035	—	1	
3×20	eShop	—	3.5	20	2.92	55	—	4	—	0.035	—	0.9	
3×25	eShop	—	3.5	25	2.92	60	—	4	—	0.035	—	0.8	
3×30	eShop	—	3.5	30	2.92	70	—	4	—	0.03	—	0.5	
3×35	eShop	—	3.5	35	2.92	70	—	4	—	0.03	—	0.35	
3×40	eShop	—	3.5	40	2.92	80	—	4	—	0.03	—	0.35	
3×45	eShop	—	3.5	45	2.92	80	—	4	—	0.03	—	0.2	



Garant Solid carbide ball nose milling cutter

Additionally **polish ground** in the flutes for **outstanding chip evacuation** in long-chipping aluminium components. Dimensions similar to **DIN 6527**.



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 7026	230	180	140	200	160	200	150	130								300	160	200					
20 7028	220	170	130	180	140	180	130	120								180	140	180					

Ø f8 D _c	11X 20 7026		11X 20 7028		L _c		L ₁		Ø D ₁	L		Ø D _s	
	Solid carbide ball nose slot drill												
	mm	uncoated	uncoated	20 7026 mm	20 7028 mm	20 7026 mm	20 7028 mm	mm	20 7026 mm	20 7028 mm	mm	mm	
3	eShop	eShop	6	10	16	32	2.7	50	75	3	0.03		
4	eShop	eShop	7	13	17	36	3.7	54	75	4	0.03		
5	eShop	eShop	8	15	18	40	4.6	54	75	5	0.06		
6	eShop	eShop	10	16	21	44	5.5	54	100	6	0.06		
8	eShop	eShop	12	22	27	54	7.5	59	100	8	0.06		
10	eShop	eShop	13	25	32	60	9.4	67	100	10	0.08		
12	eShop	eShop	16	26	38	60	11.4	73	100	12	0.08		
14	eShop	eShop	16	26	38	60	13.2	75	100	14	0.15		
16	eShop	eShop	20	30	44	92	15	83	150	16	0.15		
20	eShop	eShop	25	40	50	92	19	93	150	20	0.2		

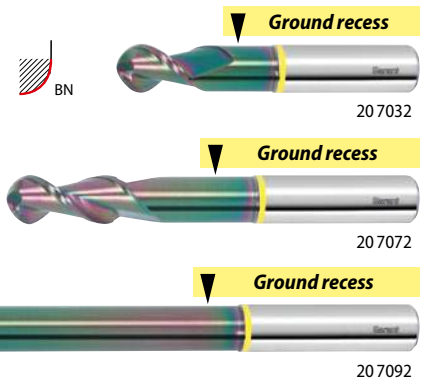
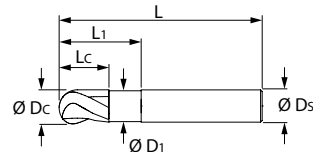


Garant Solid carbide ball nose milling cutter

With the latest generation of **DLC coating sp²**.
Tolerances: Radius contour = **±0.01 mm**.

Note:

- 20 7032 – Successor product to No. 207030.
- 20 7072 – Successor product to No. 207070.
- 20 7092 – Successor product to No. 207090.



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 7032	600	550	500	220	180	220	170	150		200	180	170	140	180		320	180	220					
20 7072	500	450	400	200	160	200	150	130		180	160	150	120	160		300	160	200					
20 7092	400	375	325	190	150	190	140	120		160	150	140	110	150		280	150	180					

Ø f8 D _c	11X	20 7032	11X	20 7072	11X	20 7092	L _c		L ₁			Ø D ₁		L			Ø D _s	
	Solid carbide ball nose slot drill						20 7032	20 7072	20 7032	20 7072	20 7092		20 7032	20 7072	20 7092			
	DLC	DLC	DLC	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
3	eShop	eShop	eShop	6	10	16	32	82	2.7	50	75	125	3	0.03				
4	eShop	eShop	eShop	7	13	17	36	86	3.7	54	75	125	4	0.03				
5	eShop	eShop	—	8	15	18	40	—	4.6	54	75	—	5	0.06				
6	eShop	eShop	eShop	10	16	21	44	94	5.5	54	100	150	6	0.06				
8	eShop	eShop	eShop	12	22	27	54	104	7.5	59	100	150	8	0.06				
10	eShop	eShop	eShop	13	25	32	60	110	9.4	67	100	150	10	0.08				
12	eShop	eShop	eShop	16	26	38	60	105	11.4	73	100	150	12	0.08				
14	eShop	eShop	—	16	26	38	60	—	13.2	75	100	—	14	0.15				
16	eShop	eShop	—	20	30	44	92	—	15	83	150	—	16	0.15				
20	eShop	eShop	—	25	40	50	92	—	19	93	150	—	20	0.2				



Garant Solid carbide high precision ball nose slot drill

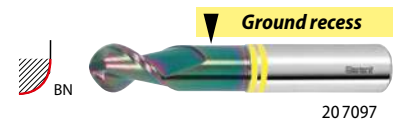
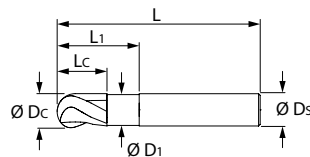
With DLC coating sp² of the latest generation.

High precision ball nose slot drills in respect of radius $\varnothing$ and contour variations within the μm range.

Tolerances: radius contour = $\pm 0.005 \text{ mm}$.

For the highest demands on dimensional accuracy of the workpiece.

Note: Successor product to No. 207095.

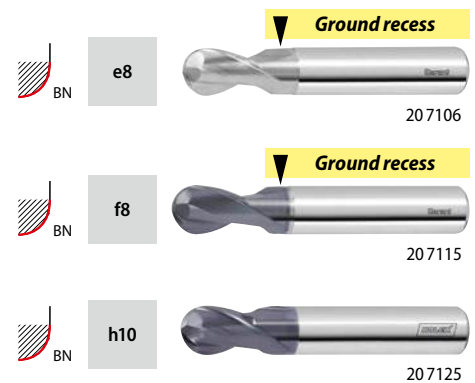
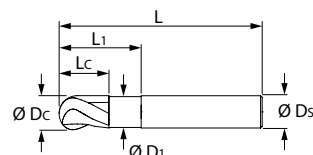


Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	> 10 % Si	acrylic						aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
207097	600	550	500	220	180	220	170	150		200	180	170	140	180		320	180	220					

$\varnothing D_c$	11X	207097	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z
		Solid carbide high precision ball nose slot drill						
mm		DLC	mm	mm	mm	mm	mm	mm
3		eShop	6	16	2.7	50	3	0.03
4		eShop	7	17	3.7	54	4	0.03
5		eShop	8	18	4.6	54	5	0.06
6		eShop	10	21	5.5	54	6	0.06
8		eShop	12	27	7.5	59	8	0.06
10		eShop	13	32	9.4	67	10	0.08
12		eShop	16	38	11.4	73	12	0.08



Solid carbide ball nose milling cutter



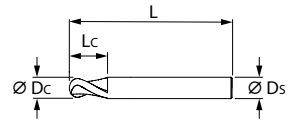
Suitable for/ v_c [m/min]	Alu	Alu	Alu											INOX	INOX	GG(G)	CuZn	Uni					
	plastics	> 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N									
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
207106	230	180	140	90	80	70	45							40	35	70	160						
207115/7125		350	250	160	140	130	80	70	50					80	70	120	320						

$\varnothing D_c$	11X	207106	11X	207115	12X	207125	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z	f_z
		Garant				HOLEX							
		Solid carbide ball nose slot drill											
mm			TiAlN	TiAlN			207106 207115	207125	207106 207115	207106 207115	mm	mm	mm
1		eShop	eShop	eShop			2	3	3	0.95	50	6	0.006
1,2		eShop	eShop	eShop			2	3	3	1.15	50	6	0.006
1,5		eShop	eShop	eShop			2	4	5	1.44	50	6	0.006
1,8		—	eShop	eShop			2	5	5.5	1.74	50	6	0.006
2		eShop	eShop	eShop			2	5	6	1.92	50	6	0.011
2,5		—	eShop	—			5	—	9	2.42	50	6	0.011
3		eShop	eShop	eShop			5	5	9	2.9	50	6	0.011
4		eShop	eShop	eShop			8	8	12	3.9	54	6	0.023
5		eShop	eShop	eShop			9	9	15	4.9	54	6	0.023
6		eShop	eShop	eShop			10	10	17	5.9	54	6	0.033
8		eShop	eShop	eShop			11	12	19	7.8	58	8	0.045
10		eShop	eShop	eShop			14	14	26	9.8	66	10	0.06
12		eShop	eShop	eShop			16	16	28	11.8	73	12	0.08
14		—	eShop	—			18	—	30	13.8	75	14	0.08
16		eShop	eShop	eShop			22	22	32	15.7	82	16	0.1
18		—	eShop	—			24	—	35	17.7	84	18	0.1
20		eShop	eShop	eShop			26	26	40	19.7	92	20	0.12



Garant Solid carbide ball nose milling cutter

Full radius ball nose slot drill with long main flutes.



20 7135

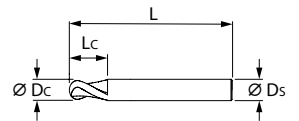
Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N							
20 7135	230	180	140	90	80	70	45							40		70	160	●		●	○			

$\varnothing f8 D_c$	11X	20 7135	L_c	L	$\varnothing D_s$	f_z	f_z
mm		Solid carbide ball nose slot drill	mm	mm	mm	mm	mm
3		eShop	20	60	3	0.011	0.013
4		eShop	30	75	4	0.023	0.025
5		eShop	30	75	5	0.023	0.025
6		eShop	40	100	6	0.033	0.037
8		eShop	40	100	8	0.045	0.051
10		eShop	40	100	10	0.06	0.068
12		eShop	45	100	12	0.08	0.09
16		eShop	75	150	16	0.1	0.113
20		eShop	75	150	20	0.12	0.135



HOLEX Solid carbide ball nose milling cutter

Note: Successor product to No. 207155.



20 7154

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N						
20 7154		350	250	160	140	130	80	70	50					80	70	120	320	●	●	○	○	○	○

$\varnothing h10 D_c$	12X	20 7154	L_c	L	$\varnothing D_s$	f_z	f_z
mm		TiAlN	mm	mm	mm	mm	mm
3		eShop	8	63	3	0.011	0.013
4		eShop	8	75	4	0.023	0.025
5		eShop	9	75	5	0.023	0.025
6		eShop	10	100	6	0.033	0.037
8		eShop	12	100	8	0.045	0.051
10		eShop	14	100	10	0.06	0.068
12		eShop	16	100	12	0.08	0.09
16		eShop	22	150	16	0.1	0.113
20		eShop	26	150	20	0.12	0.135

20



Garant Solid carbide ball nose slot drill

Exact **radius form without profile distortion**.

Double relief ground side clearance angle.

Tolerance: Radius contour = ± 0.01 mm.

20 7175 – With enclosed angle **220°**.

20 7176 – With enclosed angle **260°**.

20 7175 Size 1–10 – Size nominal $\varnothing$: **D_c = f8**

20 7176 Size 1–5 – Size nominal $\varnothing$: **D_c = 0 / -0.01 mm**.

20 7176 Size 6–10 – Size nominal $\varnothing$: **D_c = -0.01 / -0.025 mm**.

f8

Ground recess

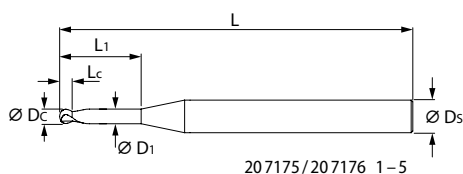


20 7175

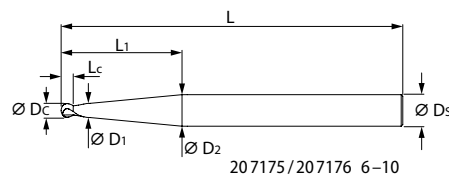
Ground recess



20 7176



20 7175/20 7176_1-5



20 7175/20 7176_6-10

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 7175/7176				575	390	390	280	200						200			575	●	●	○	●	●	

$\varnothing D_c$	11X	20 7175	11X	20 7176	L _c	L ₁	$\varnothing D_1$	$\varnothing D_2$	L	$\varnothing D_s$	
		Solid carbide ball nose slot drill									
		220° TiAlN	260° TiAlN		20 7175 mm	20 7176 mm	20 7175 mm	20 7176 mm	mm	mm	mm
mm											
1		eShop	eShop		0.7	0.7	5	0.85	0.7	–	0.006
2		eShop	eShop		1.5	1.7	10	1.7	1.4	–	0.01
3		eShop	eShop		2.3	2.6	15	2.7	2.1	–	0.01
4		eShop	eShop		3	3.5	20	3.7	2.8	–	0.032
5		eShop	eShop		3.5	4.3	25	4.7	3.5	–	0.032
6		eShop	eShop		4	5.2	30	5.3	4.2	5.9	0.044
8		eShop	eShop		5.4	7	40	6.2	5.6	7.9	0.052
10		eShop	eShop		6.7	8.7	50	7.7	7.1	9.9	0.062

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Garant Solid carbide ball nose milling cutter HPC

Precision ground for very high accuracy requirements.

Tolerance: Radius contour = ± 0.005 mm.

Note:

20 7240 – Recommended successor product is No. 207242.

20 7280 – Recommended successor product is No. 207244.

20 7320 – Recommended successor product is No. 207246.



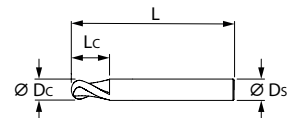
20 7240



20 7280



20 7320



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
20 7240				225	210	180	145	140						85	70		350	400		●	○	●	●
20 7280				210	190	175	140	135						80	65		300	350		●	○	●	●
20 7320				200	180	170	130	125						70	60		280	300		●	○	●	●

Ø f8 D _c / D _s	20 7240	20 7280	20 7320	L _c	L			Ø D _s			Correction factor for v _c
	Solid carbide ball nose slot drill				20 7240	20 7280	20 7320		f _z	f _z	
mm	TiAlN	HPC TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	
0,1	eShop	—	—	0,2	38	—	—	3	0.0035	0.004	—
0,2	eShop	—	—	0,4	38	—	—	3	0.0035	0.004	—
0,25	eShop	—	—	0,5	38	—	—	3	0.0035	0.004	—
0,3	eShop	—	—	1	38	—	—	3	0.0035	0.004	—
0,4	eShop	—	—	1	38	—	—	3	0.0035	0.004	—
0,5	eShop	—	—	1,5	38	—	—	3	0.0044	0.005	—
0,5/6	eShop	—	—	1,5	54	—	—	6	0.0044	0.005	—
0,6	eShop	—	—	1,5	38	—	—	3	0.0044	0.005	—
0,7	eShop	—	—	2	38	—	—	3	0.0044	0.005	—
0,8	eShop	—	—	2	38	—	—	3	0.0044	0.005	—
0,9	eShop	—	—	2,5	38	—	—	3	0.0044	0.005	—
1	eShop	—	—	2	50	—	—	3	0.006	0.007	—
1/6	eShop	eShop	—	2	54	80	—	6	0.006	0.007	1.25
1,1	eShop	—	—	3	50	—	—	3	0.006	0.007	—
1,2	eShop	—	—	3	50	—	—	3	0.006	0.007	—
1,4	eShop	—	—	3	50	—	—	3	0.006	0.007	—
1,5	eShop	—	—	3	50	—	—	3	0.006	0.007	—
1,5/6	eShop	eShop	—	3	54	80	—	6	0.006	0.007	—
1,6	eShop	—	—	4	50	—	—	3	0.006	0.007	—
1,8	eShop	—	—	4	50	—	—	3	0.006	0.007	—
2	eShop	—	—	4	50	—	—	3	0.0095	0.011	—
2/6	eShop	eShop	—	4	54	80	—	6	0.0095	0.011	1.25
2,5	eShop	—	—	5	50	—	—	3	0.0095	0.011	—
2,5/6	eShop	eShop	—	5	54	80	—	6	0.0095	0.011	—
3	eShop	eShop	eShop	5	50	75	100	3	0.0095	0.011	—
3/6	eShop	eShop	—	5	54	80	—	6	0.0095	0.011	1.25
4	eShop	eShop	eShop	8	54	75	100	4	0.032	0.037	—
4/6	eShop	eShop	eShop	8	54	80	120	6	0.032	0.037	1.25
5	eShop	eShop	eShop	9	54	75	100	5	0.032	0.037	—
5/6	eShop	eShop	—	9	54	100	—	6	0.032	0.037	1.25
6	eShop	eShop	eShop	10	54	100	120	6	0.044	0.051	—
6/8	—	—	eShop	10	—	—	120	8	0.044	0.051	1.25
7	eShop	—	—	12	59	—	—	8	0.044	0.051	—
8	eShop	eShop	eShop	12	59	100	120	8	0.052	0.06	—
8/10	—	—	eShop	12	—	—	120	10	0.052	0.06	1.25
9	eShop	—	—	14	66	—	—	10	0.052	0.06	—
10	eShop	eShop	eShop	14	66	100	120	10	0.062	0.071	—
12	eShop	eShop	eShop	16	73	100	150	12	0.073	0.084	—
14	eShop	—	—	18	75	—	—	14	0.073	0.084	—
16	eShop	eShop	—	22	82	150	—	16	0.102	0.117	—
20	eShop	eShop	—	26	92	150	—	20	0.12	0.138	—



Garant **GARANT Diabolo solid carbide ball nose slot drill HRC 62 /**
GARANT solid carbide ball nose slot drill HPC /
GARANT Diabolo solid carbide high-precision ball nose slot drill

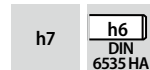
GARANT Diabolo:

Special geometry, coating and carbide for hard machining.

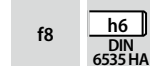
Tolerance: Radius contour = ± 0.005 mm.

20 7341 – **Specialist for steels up to 62 HRC.** Reliable process and longer service life thanks to optimised cutter geometry and state-of-the-art high-performance coating.

20 7347 – **Solid carbide high precision ball nose slot drill with radius $\emptyset$ and contour variations within the μ m range.**



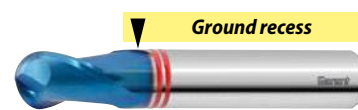
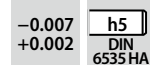
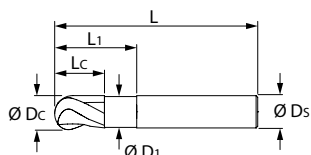
20 7341



20 7342



20 7362

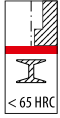
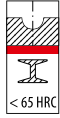


Tolerance in the μ m range.

20 7347

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
20 7341									195	180	160	125	110	85								
20 7342–20 7362									200	190	170	150	110									

$\emptyset D_c / D_s$	20 7341	20 7342	L_c	L	$\emptyset D_s$	f_z	f_z	f_z	f_z
	GARANT Diabolo solid carbide ball nose slot drill HRC 62	GARANT Diabolo solid carbide ball nose slot drill				< 60 HRC	< 65 HRC	< 60 HRC	< 65 HRC
mm	TiSiN	TiAlN	mm	mm	mm	mm	mm	mm	mm
0,1	eShop	eShop	0,2	50	38	4	3	0.007	0.005
0,2	eShop	eShop	0,4	50	38	4	3	0.01	0.005
0,25	eShop	eShop	0,5	50	38	4	3	0.01	0.005
0,3	eShop	eShop	1	50	38	4	3	0.011	0.005
0,4	eShop	eShop	1	50	38	4	3	0.012	0.005
0,5	eShop	eShop	1,5	50	38	4	3	0.016	0.005
0,5/6	–	eShop	1,5	–	54	–	6	–	0.005
0,6	eShop	eShop	1,5	50	38	4	3	0.016	0.005
0,7	eShop	eShop	2	50	38	4	3	0.016	0.005
0,8	eShop	eShop	2	50	38	4	3	0.018	0.005
0,9	eShop	eShop	2,5	50	38	4	3	0.018	0.005
1	eShop	eShop	2	54	50	6	3	0.02	0.005
1/6	–	eShop	2	–	54	–	6	–	0.005
1,1	eShop	eShop	3	54	50	6	3	0.02	0.005
1,2	eShop	eShop	3	54	50	6	3	0.022	0.005
1,4	eShop	eShop	3	54	50	6	3	0.022	0.005
1,5	eShop	eShop	3	54	50	6	3	0.024	0.005
1,5/6	–	eShop	3	–	54	–	6	–	0.005
1,6	eShop	eShop	4	54	50	6	3	0.024	0.005
1,8	eShop	eShop	4	54	50	6	3	0.026	0.005
2	eShop	eShop	4	54	50	6	3	0.026	0.005
2/6	–	eShop	4	–	54	–	6	–	0.005
2,5	eShop	eShop	5	54	50	6	3	0.026	0.019
2,5/6	–	eShop	5	–	54	–	6	–	0.019
3	eShop	eShop	5	54	50	6	3	0.03	0.019
3/6	–	eShop	5	–	54	–	6	–	0.019
4	eShop	eShop	8	54	54	6	4	0.038	0.019
4/6	–	eShop	8	–	54	–	6	–	0.019
5	eShop	eShop	9	54	54	6	5	0.051	0.048
5/6	–	eShop	9	–	54	–	6	–	0.048
6	eShop	eShop	10	54	54	6	6	0.06	0.048
8	eShop	eShop	12	58	58	8	8	0.077	0.06
10	eShop	eShop	14	66	66	10	10	0.085	0.07
12	eShop	eShop	16	73	73	12	12	0.094	0.08
14	eShop	eShop	18	75	75	14	14	0.11	0.085
16	eShop	eShop	22	82	82	16	16	0.102	0.09
20	eShop	eShop	26	92	92	20	20	0.111	0.1

D_c / D_s	11X	20 7362	11X	20 7347	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$		
		GARANT Diabolo solid carbide ball nose slot drill		GARANT Diabolo solid carbide high-precision ball nose slot drill						f_z	f_z
		HPC			20 7362	20 7347	20 7347	20 7347	20 7362	20 7347	
mm		TiAlN		TiAlN	mm	mm	mm	mm	mm	mm	mm
0,1		—		eShop	—	0.1	—	—	38	3	0.005
0,2		—		eShop	—	0.2	—	—	38	3	0.005
0,3		—		eShop	—	0.3	—	—	38	3	0.005
0,4		—		eShop	—	0.4	—	—	38	3	0.005
0,5		—		eShop	—	0.5	—	—	38	3	0.005
0,6		—		eShop	—	0.6	—	—	38	3	0.005
0,8		—		eShop	—	0.8	—	—	38	3	0.005
1		—		eShop	—	1	2	0.96	50	3	0.005
1/6		eShop		—	2	—	—	80	—	6	0.005
1,5		—		eShop	—	1.5	2.5	1.44	50	3	0.005
1,5/6		eShop		—	3	—	—	80	—	6	0.005
2		—		eShop	—	2	4	1.92	50	3	0.005
2/6		eShop		—	4	—	—	80	—	6	0.005
2,5		—		eShop	—	2.5	4	2.4	50	3	0.019
2,5/6		eShop		—	5	—	—	80	—	6	0.019
3		eShop		eShop	5	3	5	2.85	75	50	3
3/6		eShop		—	5	—	—	80	—	6	0.019
4		eShop		eShop	8	4	9	3.8	75	54	4
4/6		eShop		—	8	—	—	80	—	6	0.019
5		eShop		eShop	9	5	10	4.8	75	54	5
5/6		eShop		—	9	—	—	100	—	6	0.048
6		eShop		eShop	10	6	11	5.8	100	54	6
8		eShop		—	12	—	—	100	—	8	0.06
10		eShop		—	14	—	—	100	—	10	0.07
12		eShop		—	16	—	—	100	—	12	0.08
14		eShop		—	18	—	—	100	—	14	0.085
16		eShop		—	22	—	—	150	—	16	0.09
20		eShop		—	26	—	—	150	—	20	0.1



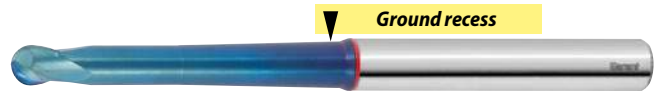
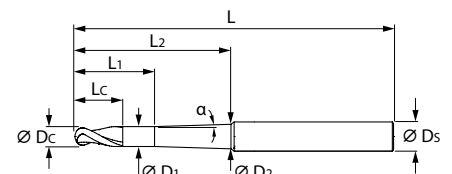
GARANT Diabolo solid carbide ball nose slot drill HPC

GARANT Diabolo:

Special geometry, coating and carbide for hard machining.

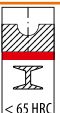
Taper transition with 1.5° (angle α).

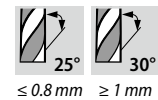
Tolerance: Radius contour = ± 0.005 mm.



207372

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si												INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
20 7372									180	170	150	135	95										

$\varnothing f8 D_c$	11X	20 7372	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	L_2	$\varnothing D_2$	
		GARANT Diabolo solid carbide ball nose slot drill								f_z
		HPC								
mm		TiAlN	mm	mm	mm	mm	mm	mm	mm	mm
0,6		eShop	0.8	1.4	0.55	75	3	27	1.9	0.005
0,8		eShop	1	1.6	0.75	75	3	27	2.1	0.005
1		eShop	1.2	2	0.95	75	3	27	2.3	0.005
1,2		eShop	1.4	2.4	1.15	75	3	27	2.5	0.005
1,5		eShop	1.8	3	1.45	75	3	27	2.7	0.005
2		eShop	2.4	4	1.95	75	3	27	3	0.005
3		eShop	4	12	2.8	80	6	40	4.3	0.019
4		eShop	5	16	3.8	80	6	40	5.1	0.019
5		eShop	6	20	4.8	80	6	40	5.9	0.048
6		eShop	6	25	5.8	100	8	50	7.1	0.048
8		eShop	7	32	7.8	120	10	60	9.3	0.06
10		eShop	9	40	9.8	160	12	80	11.9	0.07
12		eShop	11	50	11.8	200	16	100	14.5	0.08



GARANT Diabolo solid carbide precision micro copy slot drill

GARANT Diabolo:

Special geometry, coating and carbide for hard machining in the high-performance field.
Suitable even for machining electrolytic copper.

Tolerances:

■ Corner radius: Radius contour = 0 / -0.005 mm.

■ Neck Ø: $D_1 = 0 / -0.01$ mm.

20 7373 – Recess angle $\alpha = 16^\circ$.

20 7377 – Recess angle $\alpha = 16^\circ$.

Extra-sturdy shank for achieving longer tool life.

Note:

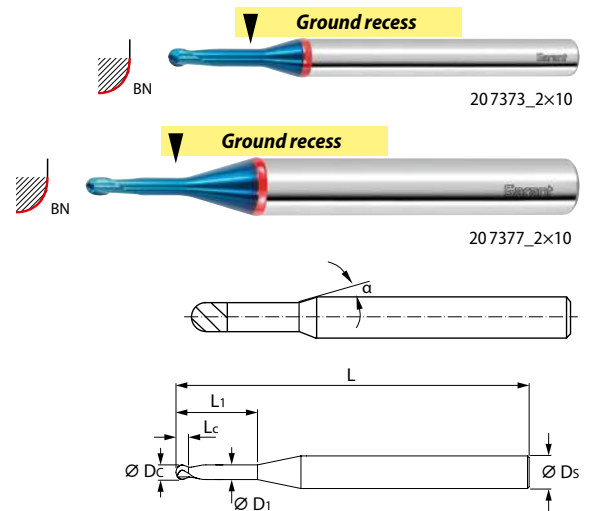
At greater tool overhang lengths, use a reduced value for a_p !

values for:

copying: $a_p = 0.05 \times D \times a_{p, \text{corr}}$

To calculate the feed rate v_f please use the actual speed of the machine (the maximum possible speed)!

e.g. $v_f = 18000 \text{ [rpm]} \times f_z \text{ [mm/Z]} \times z$



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	N					
20 7373/7377					200	200	190	170	120	100	72	55	50	45	90	80		140					

$\varnothing D_c \times L_1$	20 7373	20 7377	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Correction factor $a_{p, \text{corr}}$
mm	TiAlN	TiAlN	mm	mm	mm	mm	mm	
0,1x0,3	eShop	—	0.08	0.3	0.08	45	—	1
0,1x0,5	eShop	—	0.08	0.5	0.08	45	—	1
0,1x1	eShop	—	0.08	1	0.08	45	—	0.5
0,2x0,5	eShop	eShop	0.16	0.5	0.17	45	54	1
0,2x1	eShop	eShop	0.16	1	0.17	45	54	1
0,2x1,5	eShop	—	0.16	1.5	0.17	45	—	0.8
0,2x2	eShop	—	0.16	2	0.17	45	—	0.5
0,2x3	eShop	—	0.16	3	0.17	45	—	0.2
0,3x0,5	eShop	eShop	0.24	0.5	0.27	45	54	1
0,3x1	eShop	eShop	0.24	1	0.27	45	54	1
0,3x2	eShop	eShop	0.24	2	0.27	45	54	0.9
0,3x3	eShop	—	0.24	3	0.27	45	—	0.5
0,3x4	eShop	—	0.24	4	0.27	45	—	0.35
0,4x1	eShop	eShop	0.32	1	0.37	45	54	1
0,4x1,5	eShop	—	0.32	1.5	0.37	45	—	1
0,4x2	eShop	eShop	0.32	2	0.37	45	54	1
0,4x3	eShop	—	0.32	3	0.37	45	—	0.8
0,4x3,5	eShop	—	0.32	3.5	0.37	45	—	0.7
0,4x4	eShop	—	0.32	4	0.37	45	—	0.5
0,4x5	eShop	—	0.32	5	0.37	45	—	0.35
0,4x6	eShop	—	0.32	6	0.37	45	—	0.2
0,5x1	eShop	eShop	0.4	1	0.47	45	54	1
0,5x2	eShop	eShop	0.4	2	0.47	45	54	1
0,5x3	eShop	eShop	0.4	3	0.47	45	54	0.9
0,5x4	eShop	eShop	0.4	4	0.47	45	54	0.8
0,5x5	eShop	eShop	0.4	5	0.47	45	54	0.5
0,5x6	eShop	—	0.4	6	0.47	45	—	0.35
0,5x8	eShop	—	0.4	8	0.47	45	—	0.12
0,5x10	eShop	—	0.4	10	0.47	50	—	0.08
0,6x1	eShop	eShop	0.48	1	0.57	45	54	1
0,6x2	eShop	eShop	0.48	2	0.57	45	54	1
0,6x3	eShop	eShop	0.48	3	0.57	45	54	1
0,6x4	eShop	eShop	0.48	4	0.57	45	54	0.9
0,6x5	eShop	eShop	0.48	5	0.57	45	54	0.8
0,6x6	eShop	eShop	0.48	6	0.57	45	54	0.5
0,6x8	eShop	—	0.48	8	0.57	45	—	0.35
0,6x10	eShop	—	0.48	10	0.57	50	—	0.12
0,8x2	eShop	eShop	0.64	2	0.77	45	54	1
0,8x3	eShop	eShop	0.64	3	0.77	45	54	1
0,8x4	eShop	eShop	0.64	4	0.77	45	54	1
0,8x5	eShop	—	0.64	5	0.77	45	—	0.9
0,8x6	eShop	eShop	0.64	6	0.77	45	54	0.8
0,8x8	eShop	eShop	0.64	8	0.77	45	54	0.5

Ø D _c × L ₁	11X	20 7373	11X	20 7377	L _c	L ₁	Ø D ₁	L		Ø D ₃			Correction factor a _{p,corr}		
	GARANT Diabolo solid carbide copy slot drill							20 7373	20 7377	20 7373	20 7377			20 7373 f _z	20 7377
	mm	TiAlN	TiAlN	mm											
0,8×10	eShop	—	0.64	10	0.77	50	—	4	—	0.012	—	0.35			
1×2	eShop	eShop	0.8	2	0.96	45	54	4	6	0.02	0.022	1			
1×2,5	eShop	—	0.8	2.5	0.96	45	—	4	—	0.02	—	1			
1×3	eShop	eShop	0.8	3	0.96	45	54	4	6	0.02	0.022	1			
1×4	eShop	eShop	0.8	4	0.96	45	54	4	6	0.02	0.022	1			
1×5	eShop	eShop	0.8	5	0.96	45	54	4	6	0.02	0.022	1			
1×6	eShop	eShop	0.8	6	0.96	45	54	4	6	0.02	0.022	0.9			
1×8	eShop	eShop	0.8	8	0.96	45	45	4	4	0.02	0.02	0.8			
1×10	eShop	eShop	0.8	10	0.96	50	54	4	6	0.015	0.018	0.5			
1×12	eShop	eShop	0.8	12	0.96	50	54	4	6	0.015	0.018	0.35			
1×14	eShop	—	0.8	14	0.96	50	—	4	—	0.015	—	0.2			
1×16	eShop	eShop	0.8	16	0.96	60	54	4	6	0.015	0.018	0.12			
1×18	eShop	—	0.8	18	0.96	60	—	4	—	0.01	—	0.08			
1×20	eShop	—	0.8	20	0.96	60	—	4	—	0.01	—	0.04			
1×25	eShop	—	0.8	25	0.96	60	—	4	—	0.01	—	0.04			
1,2×2	eShop	—	0.96	2	1.16	45	—	4	—	0.02	—	1			
1,2×4	eShop	—	0.96	4	1.16	45	—	4	—	0.02	—	1			
1,2×6	eShop	eShop	0.96	6	1.16	45	54	4	6	0.02	0.022	1			
1,2×8	eShop	eShop	0.96	8	1.16	45	54	4	6	0.02	0.022	0.9			
1,2×10	eShop	eShop	0.96	10	1.16	45	54	4	6	0.02	0.022	0.8			
1,2×12	eShop	—	0.96	12	1.16	45	—	4	—	0.015	—	0.5			
1,2×14	eShop	—	0.96	14	1.16	55	—	4	—	0.015	—	0.35			
1,2×16	eShop	—	0.96	16	1.16	55	—	4	—	0.015	—	0.35			
1,2×18	eShop	—	0.96	18	1.16	55	—	4	—	0.015	—	0.2			
1,2×20	eShop	—	0.96	20	1.16	55	—	4	—	0.015	—	0.12			
1,5×3	eShop	eShop	1.2	3	1.44	45	54	4	6	0.02	0.022	1			
1,5×4	eShop	eShop	1.2	4	1.44	45	54	4	6	0.02	0.022	1			
1,5×6	eShop	eShop	1.2	6	1.44	45	54	4	6	0.02	0.022	1			
1,5×8	eShop	eShop	1.2	8	1.44	45	54	4	6	0.02	0.022	1			
1,5×10	eShop	eShop	1.2	10	1.44	45	54	4	6	0.02	0.022	0.9			
1,5×12	eShop	eShop	1.2	12	1.44	45	54	4	6	0.02	0.022	0.8			
1,5×14	eShop	—	1.2	14	1.44	50	—	4	—	0.02	—	0.8			
1,5×16	eShop	—	1.2	16	1.44	50	—	4	—	0.015	—	0.5			
1,5×18	eShop	—	1.2	18	1.44	60	—	4	—	0.015	—	0.35			
1,5×20	eShop	—	1.2	20	1.44	60	—	4	—	0.015	—	0.35			
1,6×4	eShop	—	1.28	4	1.54	45	—	4	—	0.03	—	1			
1,6×8	eShop	—	1.28	8	1.54	45	—	4	—	0.03	—	1			
1,6×12	eShop	—	1.28	12	1.54	50	—	4	—	0.03	—	0.8			
1,6×16	eShop	—	1.28	16	1.54	50	—	4	—	0.025	—	0.5			
1,6×20	eShop	—	1.28	20	1.54	60	—	4	—	0.025	—	0.35			
1,8×8	eShop	—	1.44	8	1.74	45	—	4	—	0.03	—	1			
1,8×12	eShop	—	1.44	12	1.74	45	—	4	—	0.03	—	0.9			
1,8×16	eShop	—	1.44	16	1.74	50	—	4	—	0.03	—	0.8			
1,8×20	eShop	—	1.44	20	1.74	55	—	4	—	0.025	—	0.5			
2×4	eShop	eShop	1.6	4	1.94	45	54	4	6	0.03	0.033	1			
2×6	eShop	eShop	1.6	6	1.94	45	54	4	6	0.03	0.033	1			
2×8	eShop	eShop	1.6	8	1.94	45	54	4	6	0.03	0.033	1			
2×10	eShop	eShop	1.6	10	1.94	45	54	4	6	0.03	0.033	1			
2×12	eShop	eShop	1.6	12	1.94	45	54	4	6	0.03	0.033	0.9			
2×14	eShop	eShop	1.6	14	1.94	50	54	4	6	0.03	0.033	0.9			
2×16	eShop	eShop	1.6	16	1.94	50	54	4	6	0.03	0.033	0.8			
2×18	eShop	—	1.6	18	1.94	60	—	4	—	0.03	—	0.8			
2×20	eShop	eShop	1.6	20	1.94	60	58	4	6	0.025	0.028	0.5			
2×22	eShop	—	1.6	22	1.94	60	—	4	—	0.025	—	0.5			
2×25	eShop	—	1.6	25	1.94	60	—	4	—	0.025	—	0.35			
2×30	eShop	—	1.6	30	1.94	70	—	4	—	0.025	—	0.2			
2×35	eShop	—	1.6	35	1.94	80	—	4	—	0.02	—	0.08			
2×40	eShop	—	1.6	40	1.94	80	—	4	—	0.02	—	0.08			
2,5×6	eShop	—	2	6	2.41	45	—	4	—	0.03	—	1			
2,5×8	eShop	—	2	8	2.41	45	—	4	—	0.03	—	1			
2,5×10	eShop	—	2	10	2.41	45	—	4	—	0.03	—	1			
2,5×15	eShop	—	2	15	2.41	50	—	4	—	0.03	—	0.9			
2,5×20	eShop	—	2	20	2.41	55	—	4	—	0.03	—	0.8			
2,5×25	eShop	—	2	25	2.41	60	—	4	—	0.025	—	0.5			
2,5×30	eShop	—	2	30	2.41	70	—	4	—	0.025	—	0.35			
3×6	eShop	eShop	3.5	6	2.92	45	54	4	6	0.03	0.033	1			
3×8	eShop	—	3.5	8	2.92	45	—	4	—	0.03	—	1			
3×10	eShop	eShop	3.5	10	2.92	45	54	4	6	0.03	0.033	1			
3×12	eShop	eShop	3.5	12	2.92	45	54	4	6	0.03	0.033	1			
3×14	eShop	—	3.5	14	2.92	50	—	4	—	0.03	—	1			
3×16	eShop	eShop	3.5	16	2.92	50	54	4	6	0.03	0.033	1			
3×18	eShop	—	3.5	18	2.92	55	—	4	—	0.03	—	0.9			
3×20	eShop	—	3.5	20	2.92	55	—	4	—	0.03	—	0.9			
3×25	eShop	—	3.5	25	2.92	60	—	4	—	0.03	—	0.8			
3×30	eShop	—	3.5	30	2.92	70	—	4	—	0.025	—	0.5			
3×35	eShop	—	3.5	35	2.92	70	—	4	—	0.025	—	0.35			
3×40	eShop	—	3.5	40	2.92	80	—	4	—	0.025	—	0.35			



Garant GARANT Master Steel solid carbide ball nose milling cutter HPC

Precision ground for very high accuracy requirements.

Tolerance: Radius contour = ± 0.005 mm.

Improved cutting edge protection thanks to slight edge honing.

Tremendous bending strength due to the use of ultra-fine grain substrate.



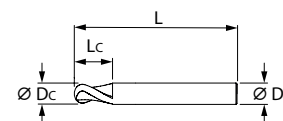
20 7242



20 7244



20 7246



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 7242				270	240	220	190	170	140					90	80		400	●		●	○	●	●
20 7244				260	230	210	180	160	130					85	75		350	●		●	○	●	●
20 7246				250	220	200	170	150	120					75	70		300	●		●	○	●	●

Ø f8 D _c /D _s	11X 20 7242	11X 20 7244	11X 20 7246	L _c	L	Ø D _s	f _z	f _z
	GARANT Master Steel solid carbide ball nose slot drill							
	HPC				20 7242	20 7244	20 7246	
mm	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm
0,1	eShop	—	—	0,2	38	—	—	3
0,2	eShop	—	—	0,4	38	—	—	3
0,25	eShop	—	—	0,5	38	—	—	3
0,4	eShop	—	—	1	38	—	—	3
0,5	eShop	—	—	1	38	—	—	3
0,5/6	eShop	—	—	1,5	54	—	—	6
0,6	eShop	—	—	1,5	38	—	—	3
0,7	eShop	—	—	1,5	38	—	—	3
0,8	eShop	—	—	2	38	—	—	3
0,9	eShop	—	—	2	38	—	—	3
1	eShop	—	—	2,5	50	—	—	3
1/6	eShop	eShop	—	2	54	80	—	6
1,1	eShop	—	—	2	50	—	—	3
1,2	eShop	—	—	3	50	—	—	3
1,4	eShop	—	—	3	50	—	—	3
1,5	eShop	—	—	3	50	—	—	3
1,5/6	eShop	eShop	—	3	54	80	—	6
1,6	eShop	—	—	4	50	—	—	3
1,8	eShop	—	—	4	50	—	—	3
2	eShop	—	—	4	50	—	—	3
2/6	eShop	eShop	—	4	54	80	—	6
2,5	eShop	—	—	5	50	—	—	3
2,5/6	eShop	eShop	—	5	54	80	—	6
3	eShop	eShop	eShop	5	50	75	100	3
3/6	eShop	eShop	—	5	54	80	—	6
4	eShop	eShop	eShop	8	54	75	100	4
4/6	eShop	eShop	—	8	54	80	—	6
5	eShop	eShop	eShop	9	54	75	100	5
5/6	eShop	eShop	—	9	54	100	—	6
6	eShop	eShop	eShop	10	54	100	120	6
7	eShop	—	—	12	58	—	—	8
8	eShop	eShop	eShop	12	58	100	120	8
9	eShop	—	—	14	66	—	—	10
10	eShop	eShop	eShop	14	66	100	120	10
12	eShop	eShop	eShop	16	73	100	150	12
14	eShop	—	—	18	75	—	—	14
16	eShop	eShop	—	22	82	150	—	16
20	eShop	—	—	26	92	—	—	20

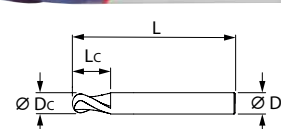


207381

Type H	f8				HPC
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207424



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 50 HRC	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	G/G(G)					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K					
20 7381				160	140	130									80	70	50	120		●	○	○	○
20 7424							200	190	170	150	110									●	○	○	○

Ø D _c	11X	20 7381	11X	20 7424	L _c		L		Ø D _s				
	Solid carbide ball nose end mill		GARANT Diabolo solid carbide ball nose end mill		20 7381	20 7424	20 7381	20 7424					
mm	TiAlN		HPC TiAlN		mm	mm	mm	mm	mm	mm	mm	mm	mm
3	eShop		eShop 		7	8	57	65	6	0.011	0.019	0.013	0.019
4	eShop		eShop		8	8	57	75	6	0.023	0.019	0.025	0.019
5	eShop		eShop		10	10	57	75	6	0.023	0.048	0.025	0.048
6	eShop		eShop 		10	12	57	100	6	0.033	0.048	0.037	0.048
8	eShop		eShop		16	14	63	100	8	0.045	0.06	0.051	0.06
10	eShop		eShop 		19	18	72	100	10	0.06	0.07	0.068	0.07
12	eShop		eShop		22	22	83	120	12	0.08	0.08	0.09	0.08
16	eShop		—		26	—	92	—	16	0.1	—	0.113	—
18	eShop		—		26	—	92	—	18	0.1	—	0.113	—



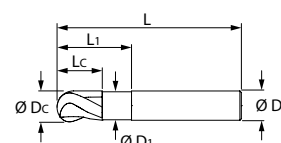
20 7441



Centre cutting teeth



207443



Suitable for/ v _c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
			cast > 10 % Si	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 7441	600	550	500	220	180	220	170	150		200	180	170	140	180		320	180	220		●	●	○	●
20 7443	500	450	400	200	160	200	150	130		180	160	150	120	160		300	160	200		●	●	○	●

Ø f8 D _c	11X	20 7441	11X	20 7443	L _c		L ₁		Ø D ₁		L		Ø D ₅		 Alu cast > 10 % Si f _z
	Solid carbide ball nose end mill				20 7441	20 7443	20 7441	20 7443		20 7441	20 7443				
	mm	DLC	DLC	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
3	eShop	eShop	6	10	16	32	2.7	50	75	3	0.03				
4	eShop	eShop	7	13	17	36	3.7	54	75	4	0.03				
5	eShop	eShop	8	15	18	40	4.6	54	75	5	0.06				
6	eShop	eShop	10	16	21	44	5.5	54	100	6	0.06				
8	eShop	eShop	12	22	27	54	7.5	59	100	8	0.06				
10	eShop	eShop	13	25	32	60	9.4	67	100	10	0.08				
12	eShop	eShop	16	26	38	60	11.4	73	100	12	0.08				
16	eShop	eShop	20	30	44	92	15	83	150	16	0.15				
20	eShop	eShop	25	40	50	92	19	93	150	20	0.2				

207473



A close-up image of a Garant 20 7474 drill bit. The bit is silver-colored with a blue band near the tip. The brand name 'Garant' is visible on the side, and the number '20 7474' is printed below it.

207474

Ø f8 D _c / D _s	11X 20 7473		11X 20 7474		L _c	L		Ø D _s		
	GARANT Master INOX solid carbide ball nose end mill					20 7473	20 7474			
	HPC									
mm	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	mm	
2	eShop	eShop	4	50	60	3	0.006	0.007		
2/6	eShop	eShop	4	54	80	6	0.006	0.007		
3	eShop	eShop	5	50	60	3	0.006	0.007		
3/6	eShop	eShop	5	54	80	6	0.006	0.007		
4	eShop	eShop	8	54	80	4	0.012	0.013		
4/6	eShop	eShop	8	54	80	6	0.012	0.013		
5	eShop	eShop	9	54	80	5	0.012	0.013		
5/6	eShop	eShop	9	54	80	6	0.012	0.013		
6	eShop	eShop	10	54	100	6	0.017	0.019		
8	eShop	eShop	12	58	100	8	0.025	0.028		
10	eShop	eShop	14	66	100	10	0.032	0.036		
12	eShop	eShop	16	73	100	12	0.045	0.051		
16	eShop	eShop	20	82	120	16	0.06	0.068		
20	eShop	eShop	26	92	120	20	0.075	0.084		

Centre cutting teeth

BN

Garat

20 7477

Centre cutting teeth 20 7477



BN

20 7478

207478

207478

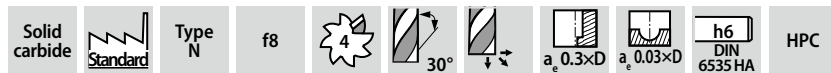
207478

207478

207478

207478

Ø f8 D _c / D _s	1X 20 7477		1X 20 7478		L _c	L	Ø D _s		
	Solid carbide ball nose end mill								
	HPC		20 7477	20 7478					
mm	TiAlN	TiAlN	mm	mm	mm	mm	mm	mm	
2	eShop	—	4	50	—	3	0.006	0.007	
2/6	eShop	eShop	4	54	80	6	0.006	0.007	
3	eShop	—	5	50	—	3	0.006	0.007	
3/6	eShop	eShop	5	54	80	6	0.006	0.007	
4	eShop	—	8	54	—	4	0.012	0.013	
4/6	eShop	eShop	8	54	80	6	0.012	0.013	
5	eShop	—	9	54	—	5	0.012	0.013	
5/6	eShop	eShop	9	54	80	6	0.012	0.013	
6	eShop	eShop	10	54	100	6	0.017	0.019	
8	eShop	eShop	12	58	100	8	0.025	0.028	
10	eShop	eShop	14	66	100	10	0.032	0.036	
12	eShop	eShop	16	73	100	12	0.045	0.051	
16	eShop	—	20	82	—	16	0.06	0.068	
20	eShop	—	26	92	—	20	0.075	0.084	



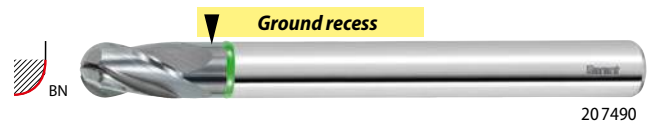
GARANT Master Steel solid carbide ball nose end mill HPC

Precision ground for very high accuracy requirements.

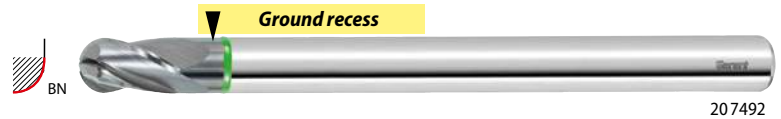
Tolerance: Radius contour = ± 0.005 mm.

Improved cutting edge protection thanks to slight edge honing.

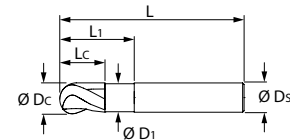
Tremendous bending strength due to the use of ultra-fine grain substrate.



207490



207492



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
207490/7492				270	240	220	190	170	140					90	80		400						

$\varnothing f_8$ D_c	20 7490	20 7492	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	f_z	f_z
	GARANT Master Steel solid carbide ball nose end mill								
	HPC								
mm	TiAlN	TiAlN	mm	mm	mm	20 7490 mm	20 7492 mm	mm	mm
2	eShop	—	4	8	1.8	50	—	4	0.015
3	eShop	eShop	5	12	2.8	50	75	4	0.02
4	eShop	eShop	8	18	3.8	50	75	4	0.03
5	eShop	eShop	9	18	4.8	50	75	6	0.035
6	eShop	eShop	10	21	5.8	57	100	6	0.045
8	eShop	eShop	12	27	7.8	63	100	8	0.06
10	eShop	eShop	14	32	9.5	72	100	10	0.065
12	eShop	eShop	16	38	11.5	83	150	12	0.07
14	eShop	—	18	44	13.5	83	—	14	0.1
16	eShop	eShop	22	44	15.5	92	150	16	0.1
20	eShop	—	26	50	19.5	104	—	20	0.15



GARANT Solid carbide ball nose roughing end mill

Round knuckle form profile for roughing, including machining radii.

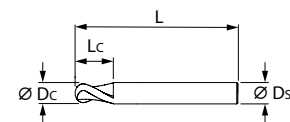
Note: Successor product to No. 207512



207505



207507



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
207505/7507		350	250	160	140	130	80							80			120						

$\varnothing d_{11}$ D_c	20 7505	20 7507	L_c	L	$\varnothing D_s$	f_z	f_z
	Solid carbide ball nose roughing end mill						
mm	TiAlN	TiAlN	mm	mm	mm	mm	mm
5	eShop	eShop	13	57	6	0.023	0.025
6	eShop	eShop	13	57	6	0.033	0.037
8	eShop	eShop	16	63	8	0.045	0.051
10	eShop	eShop	22	72	10	0.06	0.068
12	eShop	eShop	26	73	12	0.08	0.09
14	eShop	eShop	26	83	14	0.08	0.09
16	eShop	eShop	32	92	16	0.1	0.113
18	eShop	eShop	32	92	18	0.1	0.113
20	eShop	eShop	38	104	20	0.12	0.135

Dynamic 5-axis milling.

Reduce process times and increase surface quality.

PPC milling cutter
conical shape
No. 207530 12/500
 $D_c = 12 \text{ mm}$
 $R_2 = 500 \text{ mm}$



Advantages of the PPC process:

- Shorter machining times due to the large stepover.
- Lower set-up costs.
- Higher surface qualities at shorter cycle times.
- Outstanding process reliability.
- Extreme wear resistance.
- Increased productivity.



The right tool
for every application

Stepover b_r
(arc segment)

Effective radius R_2

Ball nose end mill

$br = 0.35 \text{ mm}$
 $r = 6 \text{ mm}$



Workpiece

$R_{th} = 2.5 \text{ } \mu\text{m}$

$$b_r = 2 \times \sqrt{R_{th}(2 \times r - R_{th})}$$

$$b_r = 2 \times \sqrt{\frac{2.5 \text{ } \mu\text{m}}{1000} (2 \times 6 \text{ mm} - \frac{2.5 \text{ } \mu\text{m}}{1000})} = 0.35 \text{ mm}$$

Barrel milling cutter, conical form

$br = 3.17 \text{ mm}$
 $R_2 = 500 \text{ mm}$

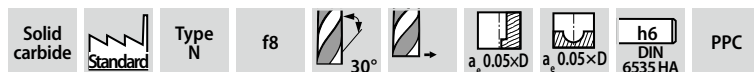


Workpiece

$R_{th} = 2.5 \text{ } \mu\text{m}$

$$b_r = 2 \times \sqrt{R_{th}(2 \times R_2 - R_{th})}$$

$$b_r = 2 \times \sqrt{\frac{2.5 \text{ } \mu\text{m}}{1000} (2 \times 500 \text{ mm} - \frac{2.5 \text{ } \mu\text{m}}{1000})} = 3.17 \text{ mm}$$



Garant Solid carbide barrel milling cutter, PPC

High-performance tool for **exceptionally efficient finish machining of free-form surfaces.**

For outstanding surface qualities in a **very short machining time.**

For use on modern 5-axis milling machines with CAD / CAM support.

Recommendation: We recommend 0.05 to 0.2mm as an allowance for finishing operations.

Note: R_2 represents the effective radius on the tool.
Cannot be reground!

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si									INOX	INOX	Ti	Inconel*	GG(G)	Uni						
	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	S	K						
20 7514/7517/7529 7531/7533/7542 7545/7548	330	300	230																	●	○	○	●
20 7520/7525/7530 7532/7534/7543 7546/7549		200	200	250	200	180	150	130	90				130	120	60		300	●		●	○	○	○
20 7523/7540/7541 7544/7551/7553								200	170	150	110									○		●	●
20 7535–20 7539		200	200										150	140	70	60				●	○	○	

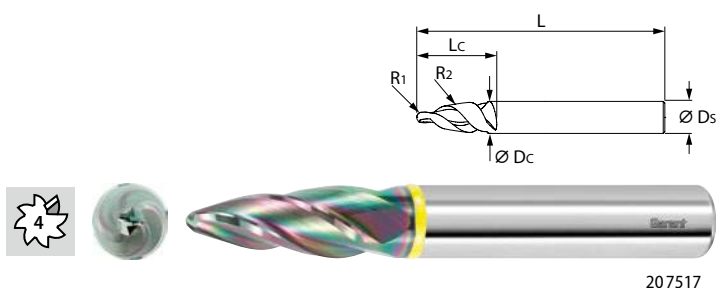
Solid carbide barrel milling cutter, tangential form

The end face geometry is designed so that the chips, especially those formed by the end radius, are of optimum shape and have optimum evacuation characteristics. For this purpose the number of cutting edges is reduced to the number of effective end face cutting edges.

207523 – Innovative coating concept for **machining hardened materials**.

Note:

207523 – **Successor product to No. 207522.**



$\varnothing f_8$ D_c / R_2	11X 20 7517 Solid carbide barrel milling cutter, tangential form PPC DLC	L_c	R_2	R_1	L	$\varnothing D_s$	 Alu f_z	 Alu f_z
mm		mm	mm	mm	mm	mm	mm	mm
6/100	eShop	20.8	100	1	62	6	0.04	0.05
10/90	eShop	24.5	90	2	80	10	0.06	0.08
12/85	eShop	27	85	2	93	12	0.07	0.09

Ø f8 D _c / R ₂	11X 20 7523	No. of teeth Z	L _c	R ₂	R ₁	L	Ø D _s		
	Solid carbide barrel milling cutter, tangential form								
mm	PPC TiAlN							f _t mm	f _t mm
6/45	eShop	4	14	45	1	60	6	0.02	0.025
8/45	eShop	4	16	45	1.5	80	8	0.025	0.03
10/40	eShop	6	16.5	40	2	80	10	0.03	0.035
12/40	eShop	6	18.5	40	2	90	12	0.035	0.04

Ø f8 D _c / R ₂	11X	20 7525					L _c	R ₂	R ₁	L	Ø D _s		
		Solid carbide barrel milling cutter, tangential form										< 900 N	< 900 N
		PPC										f _z	f _z
		TiAlN										mm	mm
mm			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
6/100		eShop	20.5	100	1	62	6	0.04	0.05				
8/95		eShop	22	95	1.5	70	8	0.05	0.06				
10/90		eShop	24.5	90	2	80	10	0.06	0.08				
12/85		eShop	27	85	2	93	12	0.07	0.09				

Solid carbide barrel milling cutter, conical form

The end face geometry is designed so that the chips, especially those formed by the end radius, are of optimum shape and have optimum evacuation characteristics.

For this purpose the number of cutting edges is reduced to the number of effective end face cutting edges.

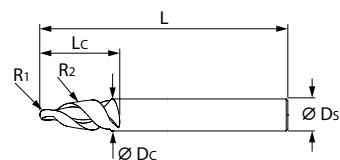
20 7540–7544 – Innovative coating concept for **machining hardened materials**.

Note: For machining walls and overcoming obstructions.

20 7540 – **Successor product to No. 207526.**

20 7541 – **Successor product to No. 207527.**

20 7544 – **Successor product to No. 207528.**



207531



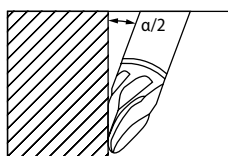
207541



207537



207532



$\varnothing f_8$ D_c / R_2	TX	20 7529	TX	20 7531	TX	20 7533	No. of teeth Z	L_c	R_2	R_1	L	$\varnothing D_s$	Alu f_z	Alu f_z
		Solid carbide barrel milling cutter, conical form $a/2=9^\circ$		Solid carbide barrel milling cutter, conical form $a/2=18^\circ$		Solid carbide barrel milling cutter, conical form $a/2=27^\circ$								
		PPC												
mm		DLC		DLC		DLC		20 7529 20 7533	20 7531	20 7529 20 7533	20 7531		mm	mm
6/250		—		eShop		—	4	—	8	—	0.5	60	0.04	0.05
12/500		eShop		eShop		—	4	22	14.5	3	2	90	0.07	0.09
16/1000		—		eShop		eShop	4	12.5	16	3	4	90	0.09	0.11

$\varnothing f_8$ D_c / R_2	TX	20 7540	TX	20 7541	TX	20 7544	No. of teeth Z	L_c	R_2	R_1	L	$\varnothing D_s$	< 60 HRC f_z	< 60 HRC f_z
		Solid carbide barrel milling cutter, conical form $a/2=9^\circ$		Solid carbide barrel milling cutter, conical form $a/2=18^\circ$		Solid carbide barrel milling cutter, conical form $a/2=27^\circ$								
		PPC												
mm		TiAlN		TiAlN		TiAlN		20 7540 20 7544	20 7541	20 7540 20 7544	20 7541		mm	mm
6/100		—		eShop		—	4	—	8.5	—	0.5	60	0.02	0.025
12/200		eShop		eShop		—	6	22	14.5	3	2	90	0.035	0.04
16/300		—		eShop		eShop	6	12.5	16	3	4	90	0.05	0.06

$\varnothing f_8$ D_c / R_2	TX	20 7535	TX	20 7537	TX	20 7539	No. of teeth Z	L_c	R_2	R_1	L	$\varnothing D_s$	INOX > 900 N f_z	INOX > 900 N f_z
		Solid carbide barrel milling cutter, conical form $a/2=9^\circ$		Solid carbide barrel milling cutter, conical form $a/2=18^\circ$		Solid carbide barrel milling cutter, conical form $a/2=27^\circ$								
		PPC												
mm		TiAlN		TiAlN		TiAlN		20 7535 20 7539	20 7537	20 7535 20 7539	20 7537		mm	mm
12/500		eShop		eShop		—	6	22	14.5	3	2	90	0.052	0.064
16/1000		—		eShop		eShop	6	12.5	16	3	4	90	0.065	0.08

$\varnothing f_8$ D_c / R_2	TX	20 7530	TX	20 7532	TX	20 7534	No. of teeth Z	L_c	R_2	R_1	L	$\varnothing D_s$	< 900 N f_z	< 900 N f_z
		Solid carbide barrel milling cutter, conical form $a/2=9^\circ$		Solid carbide barrel milling cutter, conical form $a/2=18^\circ$		Solid carbide barrel milling cutter, conical form $a/2=27^\circ$								
		PPC												
mm		TiAlN		TiAlN		TiAlN		20 7530 20 7534	20 7532	20 7530 20 7534	20 7532		mm	mm
6/250		—		eShop		—	4	—	8	—	0.5	60	0.04	0.05
12/500		eShop		eShop		—	4	22	14.5	3	2	90	0.07	0.09
16/1000		—		eShop		eShop	4	12.5	16	3	4	90	0.09	0.11

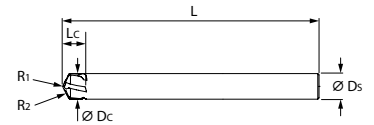
Solid carbide barrel milling cutter, short conical form

20 7551/7553 – Innovative coating concept for **machining hardened materials**.

Note: For surface machining and avoidance of interferences.

20 7551 – **Successor product to No. 20 7556.**

20 7553 – **Successor product to No. 20 7559.**



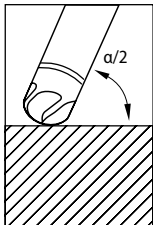
20 7542



20 7553



20 7543

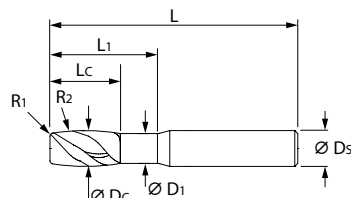


Ø f8 D _c / R ₂	20 7542	20 7545	20 7548	No. of teeth Z	L _c			R ₂	R ₁		L	Ø D _s	Alu	Alu
	Solid carbide barrel milling cutter, short conical form α/2 = 63°	Solid carbide barrel milling cutter, short conical form α/2 = 72°	Solid carbide barrel milling cutter, short conical form α/2 = 81°		20 7542	20 7545	20 7548		20 7542	20 7548			f _z	f _z
	PPC													
mm	DLC	DLC	DLC		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
8/180	eShop	eShop	eShop	3	2.4	1.9	1.4	180	1.5	3	80	8	0.055	0.065
12/220	eShop	eShop	eShop	5	3.5	2.5	1.4	220	2	4	120	12	0.07	0.09

Ø f8 D _c / R ₂	20 7551		20 7553		No. of teeth Z	L _c		R ₂	R ₁		L	Ø D _s		
	Solid carbide barrel milling cutter, short conical form α/2 = 72°		Solid carbide barrel milling cutter, short conical form α/2 = 81°											
	PPC													
mm	TiAlN	TiAlN				20 7551 mm	20 7553 mm	mm	20 7551 mm	20 7553 mm	mm	mm	mm	mm
12/100	eShop	eShop			5	2.5	1.7	100	2	4	100	12	0.035	0.04

Ø f8 D _c / R ₂	20 7543	20 7546	20 7549	No. of teeth Z	L _c			R ₂	R ₁		L	Ø D _s	< 900 N	< 900 N
	Solid carbide barrel milling cutter, short conical form α/2 = 63°	Solid carbide barrel milling cutter, short conical form α/2 = 72°	Solid carbide barrel milling cutter, short conical form α/2 = 81°		20 7543	20 7546	20 7549		20 7543	20 7549			f _z	f _z
	PPC													
mm	TiAlN	TiAlN	TiAlN		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
8/180	eShop	eShop	eShop	3	2.4	1.9	1.4	180	1.5	3	80	8	0.055	0.065
12/220	eShop	eShop	eShop	5	3.5	2.5	1.4	220	2	4	120	12	0.07	0.09

Solid carbide barrel milling cutter, straight form



20 7514



20 7520

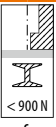
Ø f8 D _c / R ₂	20 7514	20 7520	L _c	R ₂	R ₁	L ₁	Ø D ₁	L	Ø D _s	Alu	< 900 N	Alu	< 900 N
	Solid carbide barrel milling cutter, straight form									f _z	f _z	f _z	f _z
	PPC									20 7514	20 7520	20 7514	20 7520
mm	DLC	TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
10/60	eShop	eShop	21.5	60	1	30	8	72	10	0.06	0.06	0.08	0.08
12/70	eShop	eShop	23	70	1	36	10	83	12	0.07	0.07	0.09	0.09



Tolerance: $r = \pm 0.01$ mm.

Application: For rounding and deburring **edges**.



Radius r	11X 20 8021		11X 20 8023		No. of teeth Z		Ø D ₃		Ø D ₂		L		Ø D ₅		 f _z	
	Garant		Garant													
	Solid carbide corner rounding cutter															
	HPC		20 8021	20 8023	20 8021	20 8023	20 8021	20 8023	20 8021	20 8023	20 8021	20 8023	20 8021	20 8023		
mm	TiAlN	TiAlN			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
0,2	eShop	eShop	3	6	0.5	5.6	1	6	50	58	3	6	0.01	0.02		
0,25	eShop	—	3	—	0.5	—	1	—	50	—	3	—	0.01	—		
0,3	eShop	eShop	3	6	0.5	5.4	1.2	6	50	58	3	6	0.01	0.02		
0,4	eShop	eShop	3	6	0.5	5.2	1.4	6	50	58	3	6	0.01	0.02		
0,5	eShop	eShop	3	6	0.5	7	1.6	8	50	70	3	8	0.01	0.02		
0,6	eShop	eShop	3	6	0.5	6.8	1.8	8	50	70	3	8	0.01	0.02		
0,7	eShop	—	3	—	0.5	—	2.1	—	50	—	3	—	0.01	—		
0,8	eShop	eShop	3	6	0.8	6.4	2.5	8	50	70	3	8	0.01	0.025		
0,9	eShop	—	3	—	0.8	—	2.9	—	50	—	3	—	0.01	—		
1	eShop	eShop	3	6	0.8	6	2.9	8	50	70	3	8	0.01	0.025		
1,25	eShop	—	4	—	0.8	—	3.4	—	50	—	6	—	0.02	—		
1,5	eShop	eShop	4	6	1.5	7	4.6	10	50	75	6	10	0.02	0.03		
1,75	eShop	—	4	—	1.5	—	5.6	—	50	—	6	—	0.02	—		
2	eShop	eShop	4	6	1.5	6	5.6	10	50	75	6	10	0.02	0.03		
2,25	eShop	—	5	—	1.5	—	6.6	—	50	—	8	—	0.02	—		
2,5	eShop	eShop	5	6	1.5	7	6.6	12	50	75	8	12	0.02	0.035		
3	—	eShop	—	6	—	6	—	12	—	75	—	12	—	0.035		
3,5	—	eShop	—	6	—	9	—	16	—	80	—	16	—	0.04		
4	—	eShop	—	6	—	8	—	16	—	80	—	16	—	0.04		
4,5	—	eShop	—	6	—	7	—	16	—	80	—	16	—	0.04		
5	—	eShop	—	6	—	10	—	20	—	80	—	20	—	0.05		
6	—	eShop	—	6	—	8	—	20	—	80	—	20	—	0.06		
8	—	eShop	—	6	—	9	—	25	—	100	—	25	—	0.07		
10	—	eShop	—	6	—	5	—	25	—	100	—	25	—	0.07		



Garant Solid carbide micro Woodruff keyseating cutter

Particularly suitable for slot milling and circular milling in holes. With optimised coating for universal application in virtually all materials.

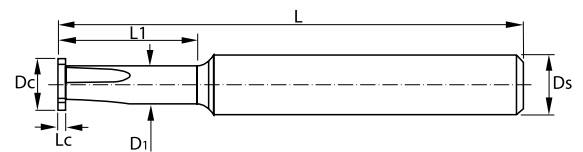
Tolerance, nominal diameter $D_c = \pm 0.04$ mm.

Tolerance, cutter length $L_c = \pm 0.02$ mm.

Size 5,8×0,5–5,8×1,5 – Minimum hole diameter is 6 mm.

Size 7,8×0,7–7,8×2,0 – Minimum hole diameter is 8 mm.

Note: Always use climb milling. Engage loop of 180° to achieve the full depth of cut. Make sure the depth of the slot is linear.
 $ae_{max} = 0.1 \times D$.



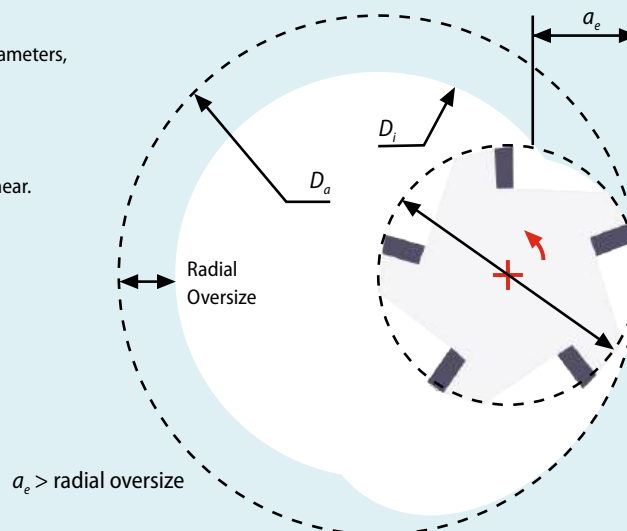
Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 8033	300			220	190	160	150	100						100			180						

$\varnothing D_c \times L_c$	11Z	20 8033	L1	$\varnothing D_1$	L	$\varnothing D_s$	f_z
		Solid carbide micro Woodruff keyseating cutter					
mm		AlTiN	mm	mm	mm	mm	mm
5,8×0,5		eShop	15	3.8	58	6	0.02
5,8×0,6		eShop	15	3.8	58	6	0.02
5,8×0,7		eShop	15	3.8	58	6	0.02
5,8×0,8		eShop	15	3.8	58	6	0.025
5,8×0,9		eShop	15	3.8	58	6	0.025
5,8×1,0		eShop	15	3.8	58	6	0.03
5,8×1,5		eShop	15	3.8	58	6	0.03
7,8×0,7		eShop	25	5	68	8	0.02
7,8×0,8		eShop	25	5	68	8	0.025
7,8×0,9		eShop	25	5	68	8	0.025
7,8×1,0		eShop	25	5	68	8	0.03
7,8×1,5		eShop	25	5	68	8	0.03
7,8×2,0		eShop	25	5	68	8	0.03

Garant Application instructions for solid carbide micro Woodruff keyseating cutters

Due to the unfavourable contact ratio of milling cutter (D_i) to hole, particularly in the case of small hole diameters, please note the following:

- Always use climb milling.
- Use engage loop of 180° to achieve the full depth of cut.
- Make sure the depth of the slot is linear.



$$a_e = \frac{D_a^2 - D_i^2}{4(D_i - D_{wz})}$$

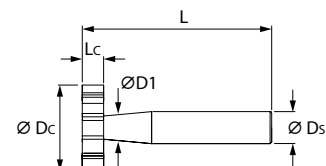
a_e cutting width
 radial cutting depth [mm]
 D_a external (enlarged)
 diameter [mm]
 D_i internal (existing)
 bore diameter [mm]
 D_{wz} milling tool diameter [mm]



Garant Solid carbide high performance Woodruff keyseating cutter

With new high-performance coating for very long tool life. Peripheral cutting, alternate set teeth (staggered). The sides of the teeth are ground to give clearance. Size 38,5×10; 45,5×10 – With chip separators – type NF.

Note: Suitable for milling Woodruff keyways to DIN 6888.
 f_z for $a_p = 0.1 \times D$.
Successor product to No. 208025.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
208024				70	67	65	63	60						40									

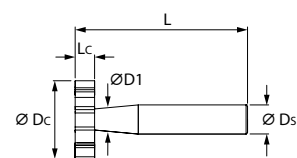
$\varnothing D_c \times L_c$ h11 × e8	208024	No. of teeth Z	for Woodruff key- ways to DIN 6888	$\varnothing D_1$	L	$\varnothing D_s$	f_z
mm	TiAlN		mm	mm	mm	mm	mm
10,5×2	eShop	6	2.0×3.7	4	50	6	0.025
10,5×3	eShop	6	3.0×3.7	4.2	50	6	0.025
13,5×2	eShop	8	2.0×5.0	4.6	56	10	0.03
13,5×3	eShop	8	3.0×5.0	4.6	56	10	0.03
13,5×4	eShop	8	4.0×5.0	4.6	56	10	0.03
16,5×3	eShop	10	3.0×6.5	4.6	56	10	0.03
16,5×4	eShop	10	4.0×6.5	4.6	56	10	0.03
19,5×3	eShop	10	3.0×7.5	5.6	63	10	0.035
19,5×4	eShop	10	4.0×7.5	5.6	63	10	0.035
22,5×4	eShop	10	4.0×9.0	6	63	10	0.035
25,5×5	eShop	10	5.0×10.0	7.5	63	10	0.04
28,5×5	eShop	10	5.0×11.0	8.5	63	10	0.04
32,5×5	eShop	10	5.0×13.0	8.5	71	12	0.04
38,5×10	eShop	10	10.0×15.0	11.8	71	12	0.045
45,5×10	eShop	10	10.0×16.0	11.8	71	12	0.045



Garant Solid carbide T-slot cutter

With new high-performance coating for very long tool life. The mill cuts on all three sides. Due to alternate set teeth (staggered).

Note: Suitable for milling T-slots according to DIN 650.
 Feed at 50 % f_z until full engagement.
Successor product to No. 208032.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
208026				105	90	90	80	60															

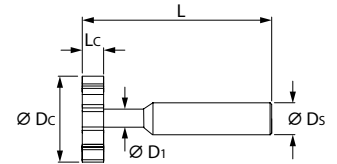
$\varnothing D_c \times L_c$ d11 × d11	208026	for T-slots DIN 650	$\varnothing D_1$	L	$\varnothing D_s$	Corner chamfer width at 45°	f_z
mm	TiAlN	mm	mm	mm	mm	mm	mm
12,5×6	eShop	6	5	57	10	0.2	0.033
16×8	eShop	8	7	62	10	0.2	0.034
18×8	eShop	10	8	70	12	0.2	0.034
21×9	eShop	12	10	74	12	0.2	0.034
25×11	eShop	14	12	82	16	0.2	0.034
28×12	eShop	16	13	85	16	0.2	0.035
32×14	eShop	18	15	90	16	0.2	0.045



Garant Solid carbide T-slot cutter with semi-roughing profile

With new high-performance coating for very long tool life. The sides of the teeth are ground to give clearance and thus cannot jam in the component. With semi-roughing profile.

Note: For milling T-slots to DIN 650.
Feed at 50 % f_z until full engagement.
Successor product to No. 208034.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
208027				105	90	90	80	60															

$\varnothing D_c \times L_c$ d11 $\times$ d11	208027	for T-slots DIN 650	$\varnothing D_1$	L	$\varnothing D_s$	Corner chamfer width at 45°	f_z
mm	TiAlN Solid carbide T-slot cutter, semi-roughing	mm	mm	mm	mm	mm	mm
12,5×6	eShop	6	5	57	10	0.2	0.033
16×8	eShop	8	7	62	10	0.2	0.034
18×8	eShop	10	8	70	12	0.2	0.034
21×9	eShop	12	10	74	12	0.2	0.034
25×11	eShop	14	12	82	16	0.2	0.034
28×12	eShop	16	13	85	16	0.2	0.035
32×14	eShop	18	15	90	16	0.2	0.035

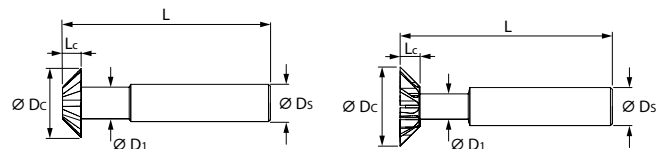
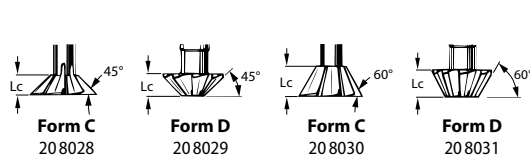


Garant Solid carbide dovetail milling cutter

With new high-performance coating for very long tool life.
Angular tolerance ± 8 arc minutes.

Note: For milling dovetails in tool making and machine building.
Feed at 50 % f_z until full engagement.

208028 – Successor product to No. 208035.
208029 – Successor product to No. 208036.
208030 – Successor product to No. 208037.
208031 – Successor product to No. 208038.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
208028–208031				105	90	90	80	60															

Ø js16 D _c	11X 20 8028	11X 20 8029	11X 20 8030	11X 20 8031	No. of teeth Z		Ø D ₁				L	Ø D _s	L _c		 f _z
	Solid carbide dovetail milling cutter Form C	Solid carbide dovetail milling cutter Form D	Solid carbide dovetail milling cutter Form C	Solid carbide dovetail milling cutter Form D	20 8028 20 8030	20 8029 20 8031	20 8028	20 8029	20 8030	20 8031			20 8028 20 8029	20 8030 20 8031	
mm	TiAlN	TiAlN	TiAlN	TiAlN			mm	mm	mm	mm	mm	mm	mm	mm	mm
12	(eShop)	(eShop)	(eShop)	(eShop)	6	6	5	5	5	5	55	10	3	5	0.04
16	eShop	eShop	eShop	eShop	6	6	6.7	8	6	8.2	60	10	4	6.3	0.042
20	eShop	eShop	eShop	eShop	8	8	7	10	7.8	10.5	63	12	5	8	0.042
22	eShop	eShop	eShop	eShop	8	8	8	10.2	10	10.2	67	12	6	9	0.043
25	eShop	eShop	eShop	eShop	8	8	8	11	9	11.5	67	12	6.3	10	0.045
28	eShop	eShop	eShop	eShop	9	10	8.5	14	13	14	80	16	7.5	11	0.045
32	eShop	eShop	eShop	eShop	9	10	13	15	15	15	71	16	8	12.5	0.045
38	eShop	eShop	eShop	eShop	9	10	15	15	15	15	80	16	10	16	0.045

Suitable for/ v _c [m/min]	Alu plastics	Alu 	Alu cast > 10 % Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 8040	180	140	105	70	60	55	35							40			55	●		○	○	●	●

Ø h6 D _c	11X	20 8040	L _c	L	Ø D _s	 < 900 N f _z
	Solid carbide engraving cutter					
	60°					
mm			mm	mm	mm	mm
3		eShop	15	50	3	0.01
4		eShop	18	50	4	0.02
6		eShop	20	54	6	0.03

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 8065–20 8080	180	140	105	70	60	55	35							40			55	●		●	○		○

Ø e8 D _c	11X	20 8065	11X	20 8070	11X	20 8080	L _c	L	Ø D _s	 f _z  < 900 N			
	Solid carbide chamfer mill												
mm	60°			90°			120°			mm	mm	mm	mm
3	eShop			eShop			eShop			8	57	6	0.01
4	eShop			eShop			eShop			11	57	6	0.02
5	eShop			eShop			eShop			13	57	6	0.02
6	eShop			eShop			eShop			13	57	6	0.03
8	eShop			eShop			eShop			19	63	8	0.04
10	eShop			eShop			eShop			22	72	10	0.05
12	eShop			eShop			eShop			26	83	12	0.06
16	eShop			eShop			eShop			32	92	16	0.08
20	eShop			eShop			eShop			38	104	20	0.1

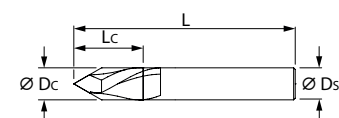


Garant Solid carbide engraving cutter, spiral flutes

Outstanding surface qualities thanks to the **35° helix angle**. For **higher feed rates** due to **2 cutting edges**. Engraving cutter for **universal use** in virtually all materials. The newly developed coating effectively prevents built-up edges, even in aluminium or stainless steel.

Application: For engraving contours.

Note: f_z for $a_p = 1.0 \times D$



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast Si 											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 8086	180	300	220	130	115	110	80	65	35					90	70	50	100	●		●	○	○	○

Ø h6 D _c	TiX 20 8086 Solid carbide engraving cutter, spiral flutes 60° TiAlN	L _c	L	Ø D _s	 < 900 N f_z
mm		mm	mm	mm	mm
3	eShop	3	50	3	0.03
4	eShop	5	50	4	0.04
6	eShop	7	54	6	0.05

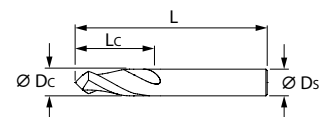
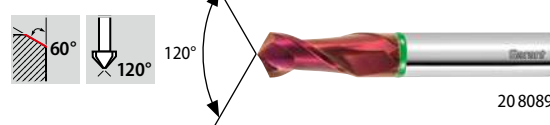
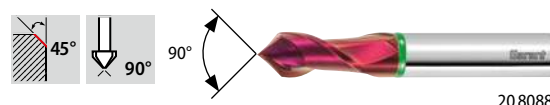
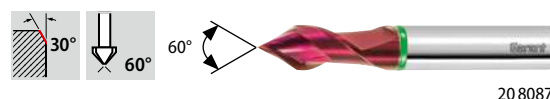


Garant Solid carbide chamfer mill, spiral flutes

Tolerance: Point angle ± 5 arc minutes.

Outstanding surface qualities thanks to the **35° helix angle**. Chamfer mill for **universal application** in virtually all materials. The newly developed coating effectively prevents built-up edges, even in aluminium or stainless steel.

- Application:**
- Centring
 - Drilling
 - Countersinking
 - Chamfering



Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast Si 												INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K						
20 8087–20 8089	180	300	220	130	115	110	80	65	35						90	70	50	100	●		●	○	○	○

Ø e8 D _c	11X	20 8087	11X	20 8088	11X	20 8089	L _c	L	Ø D _s		
	Solid carbide chamfer mill, spiral flutes									< 900 N	> 900 N
	60°	90°	120°	f _z	f _z						
mm	TiAlN	TiAlN	TiAlN	mm	mm	mm	mm	mm			
3	eShop	eShop	eShop	8	57	6	0.02	0.018			
4	eShop	eShop	eShop	11	57	6	0.03	0.027			
5	eShop	eShop	—	13	57	6	0.04	0.036			
6	eShop	eShop	eShop	13	57	6	0.05	0.045			
8	eShop	eShop	eShop	19	63	8	0.06	0.054			
10	eShop	eShop	eShop	22	72	10	0.07	0.063			
12	eShop	eShop	eShop	26	83	12	0.08	0.072			
16	—	eShop	—	32	92	16	0.1	0.08			
20	—	eShop	—	38	104	20	0.12	0.11			



Garant Solid carbide deburrer

Tolerance: **Dimension S** = ± 0.1 mm, **point angle** ± 10 arc minutes.
With special flute geometry for smooth cutting.

Application: Perfectly suitable for **chamfering** and **deburring** component edges and for **contouring applications**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 8090	180	140	105	70	60	55	35							40	30		55	●		●	○	○	○
20 8092		280	200	120	105	100	70	60	35					80	60		90	●		●	○	○	○

Ø h6 D _c	11X	20 8090	11X	20 8092	No. of teeth Z	Dimension S	L	Ø D _s	f _z
		Solid carbide deburrer							
		120°							
mm				TiAlN		mm	mm	mm	mm
1		—		eShop	3	0.5	50	3	0.005
2		—		eShop	3	1.1	50	3	0.01
3		—		eShop	3	1.6	50	3	0.01
4		—		eShop	4	2.2	54	4	0.02
6		eShop		eShop	4	3.4	57	6	0.03
8		eShop		eShop	4	4.4	63	8	0.04
10		eShop		eShop	4	5.5	72	10	0.05
12		eShop		eShop	4	6.6	83	12	0.06
16		eShop		eShop	4	8.9	93	16	0.08



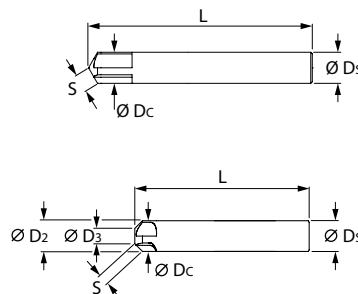
Solid carbide deburrer

Tolerance: **Dimension S** = ± 0.1 mm, **point angle** ± 10 arc minutes.

20 8095/8105 – With special flute geometry for smooth cutting.

Size 6M; 10M; 12M – Extra long. For outstanding deburring results on particularly difficult-to-access contours. Tools without tip.

Application: Perfectly suitable for **chamfering** and **deburring** component edges and for **contouring applications**.



Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 8095/8097	180	140	105	70	60	55	35							40	30		55	●		●	○	○	○
20 8105/8107		280	200	120	105	100	70	60	35					80	60		90	●		●	○	○	○

Ø h6 D _c	11X	20 8095	12X	20 8097	11X	20 8105	12X	20 8107	Ø D _s	Ø D ₂	No. of teeth Z	Dimension S	L	Ø D _s	f _z
		Garant		HOLEX		Garant		HOLEX							
		Solid carbide deburrer													
		90°													
mm				TiAlN		TiAlN			mm	mm		mm	20 8095 20 8105	20 8097 20 8107	mm
1		eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	—	3	0.7	50	38	3
2		eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	—	3	1.4	50	38	3
3		eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	—	3	2.1	50	38	3
4		eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	—	4	2.8	54	50	4
6		eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	—	4	4.2	57	54	6
6M		eShop	—	eShop	—	eShop	—	eShop	3	6	4	2.1	100	—	6
8		eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	—	4	5.6	63	59	8
10		eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	—	4	7	72	67	10
10M		eShop	—	eShop	—	eShop	—	eShop	5	10	4	3.5	100	—	10
12		eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	—	4	8.5	83	74	12
12M		eShop	—	eShop	—	eShop	—	eShop	6	12	4	4.2	120	—	12
16		eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	—	4	11.2	93	80	16

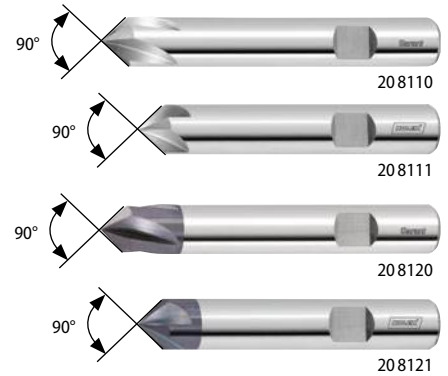


Solid carbide deburrer

Tolerance: **Dimension S** = ± 0.1 mm, point angle ± 10 arc minutes.

208110/8120 – With special flute geometry for smooth cutting.

Application: Perfectly suitable for **chamfering** and **deburring** component edges and for **contouring applications**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
208110/8111	180	140	105	70	60	55	35							40	30		55	●					
208120/8121	280	200	120	105	100	70	60	35						80	60		90	●					

Ø h6 D _c	11X 208110	12X 208111	11X 208120	12X 208121	Dimension S	L	Ø D _s	
	Garant	HOLEX	Garant	HOLEX				
	Solid carbide deburrer							
	90°							
mm			TiAlN	TiAlN	mm	208110 208120	208111 208121	mm
6	eShop	eShop	eShop	eShop	4.2	57	54	6
8	eShop	eShop	eShop	eShop	5.6	63	59	8
10	eShop	eShop	eShop	eShop	7	72	67	10
12	eShop	eShop	eShop	eShop	8.5	83	74	12
16	eShop	—	eShop	—	11.2	93	—	16
								mm
								mm

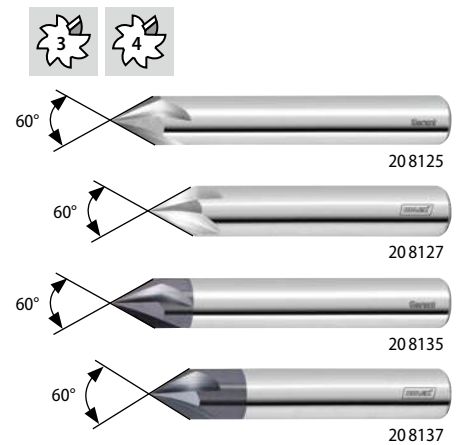


Solid carbide deburrer

Tolerance: **Dimension S** = ± 0.1 mm, point angle ± 10 arc minutes.

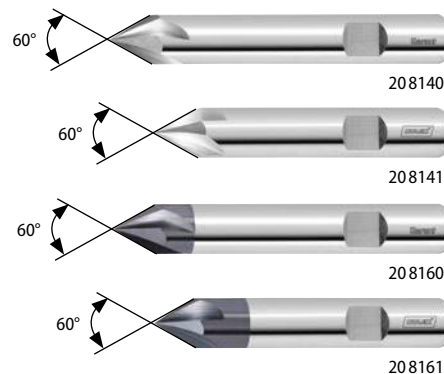
208125/8135 – With special flute geometry for smooth cutting.

Application: Perfectly suitable for **chamfering** and **deburring** component edges and for **contouring applications**.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
208125/8127	180	140	105	70	60	55	35							40	30		55	●					
208135/8137	280	200	120	105	100	70	60	35						80	60		90	●					

Ø h6 D _c	11X 208125	12X 208127	11X 208135	12X 208137	No. of teeth Z	Dimension S	L	Ø D _s	
	Garant	HOLEX	Garant	HOLEX					
	Solid carbide deburrer								
	60°								
mm			TiAlN	TiAlN		mm	208125 208135	208127 208137	mm
1	—	—	eShop	eShop	3	0.9	50	38	3
2	eShop	—	eShop	eShop	3	1.9	50	38	3
3	eShop	eShop	eShop	eShop	3	2.9	50	38	3
4	eShop	eShop	eShop	eShop	4	3.9	54	50	4
6	eShop	eShop	eShop	eShop	4	5.9	57	54	6
8	eShop	eShop	eShop	eShop	4	7.9	63	59	8
10	—	eShop	eShop	eShop	4	9.9	72	67	10
12	eShop	eShop	eShop	eShop	4	11.9	83	74	12
16	—	—	eShop	eShop	4	15.8	93	80	16
									mm
									mm

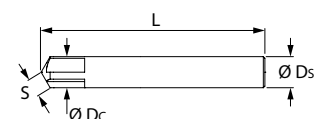


208140/8160 – With special flute geometry for smooth cutting.

Ø h6 D _c	1X 20 8140		12X 20 8141		1X 20 8160		12X 20 8161		Dimension S	L		Ø D _s	 f ₇
	Garant		HOLEX		Garant		HOLEX			20 8140 20 8160	20 8141 20 8161		
	Solid carbide deburrer												
	60°												
mm				TiAlN	TiAlN				mm	mm	mm	mm	mm
6	eShop	eShop	eShop	eShop	eShop				5.9	57	54	6	0.03
8	eShop	eShop	eShop	eShop	eShop				7.9	63	59	8	0.04
10	eShop	eShop	eShop	eShop	eShop				9.9	72	67	10	0.05
12	eShop	eShop	eShop	eShop	eShop				11.9	83	74	12	0.06
16	eShop	—	eShop	eShop	—				15.8	93	—	16	0.08



With special flute geometry for smooth cutting.



Ø h6 D _c	20 8150		20 8152		No. of teeth Z	Dimension S	L	Ø D _s	 f _z
	1X		1X						
	Solid carbide deburrer								
	30°		TiAlN						
mm						mm	mm	mm	mm
1	eShop		eShop		3	1.8	50	3	0.005
2	eShop		eShop		3	3.7	50	3	0.01
3	eShop		eShop		3	5.6	50	3	0.01
4	eShop		eShop		4	7.5	54	4	0.02
6	eShop		eShop		4	11.2	57	6	0.03
8	eShop		eShop		4	14.9	63	8	0.04
10	eShop		eShop		4	18.6	72	10	0.05
12	eShop		eShop		4	22.4	83	12	0.06
16	eShop		eShop		4	30	93	16	0.08



Garant Solid carbide deburrer, spiral flutes

Deburrer with **polished flutes** and **sharp cutting edges** especially for machining aluminium and plastic.

Tolerance: **Dimension S** = +/- 0.2 mm.

Point angle = +/- 5 arc minutes.

Outstanding surface qualities thanks to the 35° helix angle.

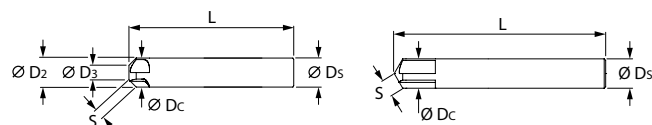
Size 6M; 10M; 12M – Extra-long deburrers for outstanding deburring results on particularly difficult-to-access contours. Tools without tip.

Application: Perfectly suitable for **chamfering** and **deburring** component edges and for **contouring applications**.

For aluminium and plastics



20 8154



Suitable for/ v _c [m/min]	Alu plastics	Alu 	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey- comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 8154	480	440	400	210			150			150	150	150	130	160		300	160	200		●			

Ø h6 D _c	11X	20 8154	Ø D ₃	Ø D ₂	No. of teeth Z	Dimension S	L	Ø D _s		PMMA acrylic
	Solid carbide deburrer, spiral flutes									
	90°								f _z	f _z
mm			mm	mm		mm	mm	mm	mm	mm
0,5	eShop		—	—	3	0.3	50	3	0.01	0.01
0,8	eShop		—	—	3	0.5	50	3	0.01	0.01
1	eShop		—	—	3	0.7	50	3	0.01	0.01
2	eShop		—	—	4	1.4	50	3	0.02	0.02
3	eShop		—	—	4	2.1	50	3	0.02	0.02
4	eShop		—	—	4	2.8	50	4	0.03	0.03
6	eShop		—	—	4	4.2	57	6	0.045	0.045
6M	eShop		3	6	4	2.1	100	6	0.045	0.045
8	eShop		—	—	4	5.6	63	8	0.055	0.055
10	eShop		—	—	4	7	72	10	0.07	0.07
10M	eShop		5	10	4	3.5	100	10	0.07	0.07
12	eShop		—	—	4	8.5	83	12	0.085	0.085
12M	eShop		6	12	4	4.2	120	12	0.085	0.085
16	eShop		—	—	4	11.2	92	16	0.1	0.1



Garant Solid carbide deburrer, spiral flutes

Deburrer for **universal application** on virtually all materials. The newly developed coating effectively prevents built-up edges, even in aluminium or stainless steel.

Tolerance: **Dimension S** = +/- 0.2 mm.

Point angle = +/- 5 arc minutes.

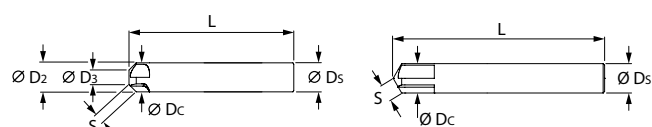
Outstanding surface qualities thanks to the 35° helix angle.

Size 6M; 10M; 12M – Extra-long deburrers for outstanding deburring results on particularly difficult-to-access contours. Tools without tip.

Application: Perfectly suitable for **chamfering** and **deburring** component edges and for **contouring applications**.



20 8156



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K							
20 8156	180	300	220	130	115	110	80	65	35					90	70	50	100	●		●	○	○	○	○

Ø h6 D _c	11X 20 8156	Ø D ₃	Ø D ₂	No. of teeth Z	Dimension S	L	Ø D _s	 < 900 N f _z
	Solid carbide deburrer, spiral flutes							
	90° TiSiN							
mm		mm	mm		mm	mm	mm	mm
0,5	eShop	—	—	3	0.3	50	3	0.02
0,8	eShop	—	—	3	0.5	50	3	0.02
1	eShop	—	—	3	0.7	50	3	0.02
2	eShop	—	—	4	1.4	50	3	0.03
3	eShop	—	—	4	2.1	50	3	0.03
4	eShop	—	—	4	2.8	50	4	0.04
6	eShop	—	—	4	4.2	57	6	0.05
6M	eShop	3	6	4	2.1	100	6	0.03
8	eShop	—	—	4	5.6	63	8	0.06
10	eShop	—	—	4	7	72	10	0.07
10M	eShop	5	10	4	3.5	100	10	0.05
12	eShop	—	—	4	8.5	83	12	0.08
12M	eShop	6	12	4	4.2	120	12	0.06
16	eShop	—	—	4	11.2	93	16	0.1



Garant GARANT Diabolo solid carbide deburrer, spiral flutes

Deburrer specially developed for **hard machining**. The further development of the Diabolo coating permits even longer tool life and improved surface quality.

Tolerance: **Dimension S** = ± 0.2 mm.

Point angle = ± 5 arc minutes.

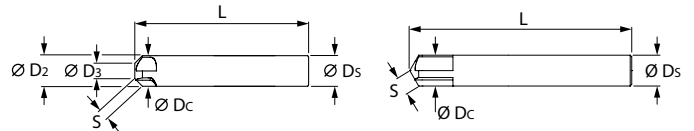
Outstanding surface qualities thanks to the 35° helix angle.

Size 6M; 10M; 12M – Extra-long deburrers for outstanding deburring results on particularly difficult-to-access contours. Tools without tip.

Application: Perfectly suitable for **chamfering** and **deburring** component edges and for **contouring** applications.



20 8158



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N							
20 8158							140	120	100	90	60	35										○	●	●

Ø h6 D _c	11X 20 8158	Ø D ₃	Ø D ₂	No. of teeth Z	Dimension S	L	Ø D _s	 < 60 HRC f _z
	GARANT Diabolo solid carbide deburrer, spiral flutes							
	90° TiAlN							
mm		mm	mm		mm	mm	mm	mm
6	eShop	–	–	6	4.2	57	6	0.03
6M	eShop	3	6	6	2.1	100	6	0.02
8	eShop	–	–	6	5.6	63	8	0.04
10	eShop	–	–	6	7	72	10	0.045
10M	eShop	5	10	6	3.5	100	10	0.035
12	eShop	–	–	6	8.5	83	12	0.055
12M	eShop	6	12	6	4.2	120	12	0.045
16	eShop	–	–	6	11.2	93	16	0.07



Garant Solid carbide deburrer

With special flute geometry, smooth cutting. Tolerance: **Dimension S** = ± 0.2 mm.

Application: Perfectly suitable for **chamfering** and **deburring** component edges and for **contouring** applications.



20 8162



20 8164



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	K						
20 8162	180	140	105	70	60	55	35						40	30		55	●	●	○	○	○	○
20 8164		280	200	120	105	100	70	60	35				80	60		90	●	●	○	○	○	○

Ø h6 D _c	11X	20 8162	11X	20 8164	No. of teeth Z	Dimension S	L	Ø D _s	 < 900 N f _z
	Solid carbide deburrer								
	90°								
mm	TiAlN					mm	mm	mm	mm
6	eShop				6	4.2	57	6	0.03
8	eShop				6	5.6	63	8	0.04
10	eShop				6	7	72	10	0.05
12	eShop				6	8.5	83	12	0.06
16	eShop				8	11.2	92	16	0.08
20	—				8	14	104	20	0.1



Garant Solid carbide deburrer, spiral flutes / GARANT Diabolo solid carbide deburrer, spiral flutes

208165 – Deburrer for **universal application** on virtually all materials.
The newly developed coating effectively prevents built-up edges, even in aluminium or stainless steel.

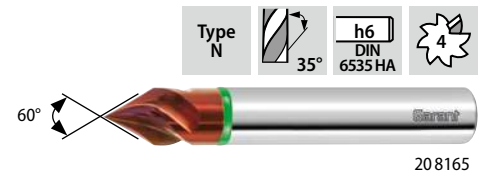
208167 – Deburrer specially developed for **hard machining**.
The further development of the DIABOLO coating permits even longer tool life and improved surface quality.

208165/8167 – **Outstanding surface qualities** thanks to the **35° helix angle**.
Tolerance: **Dimension S** = ± 0.2 mm. **Point angle** ± 5 arc minutes.

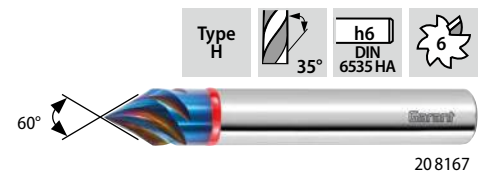
Size 6M; 10M; 12M – Extra-long deburrers for outstanding deburring results on particularly difficult-to-access contours. Tools without tip.

208166/8168 – With special flute geometry, smooth cutting.
Tolerance: **Dimension S** = ± 0.2 mm.

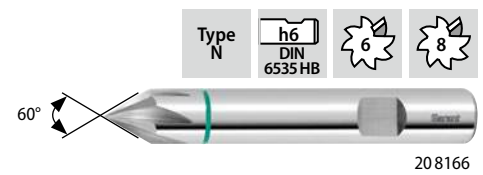
Application: Perfectly suitable for **chamfering** and **deburring** component edges and for **contouring applications**.



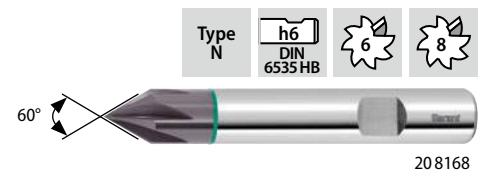
208165



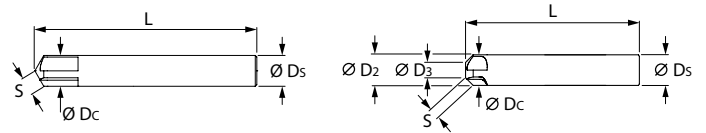
208167



208166



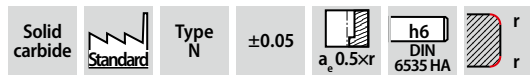
208168



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	M	M	S	K						
208165	180	300	220	130	115	110	80	65	35				90	70	50	100	●	●	○	○	○	○
208166	180	140	105	70	60	55	35						40	30		55	●	●	○	○	○	○
208167							140	120	100	90	60	35						●	○	○	○	○
208168		280	200	120	105	100	70	60	35				80	60		90	●	●	○	○	○	○

Ø h6 D _c	11X	20 8165	11X	20 8167	Ø D ₃	Ø D ₂	No. of teeth Z		Dimension S	L	Ø D _s		
	Solid carbide deburrer, spiral flutes		GARANT Diabolo solid carbide deburrer, spiral flutes				20 8165	20 8167				f _z	f _z
	60°		f _z	f _z									
mm	TiSiN		TiAlN		mm	mm			mm	mm	mm	mm	mm
6	eShop		eShop		—	—	4	6	5.9	57	6	0.05	0.03
6M	eShop		eShop		3	6	4	6	2.9	100	6	0.03	0.02
8	eShop		eShop		—	—	4	6	7.9	63	8	0.06	0.04
10	eShop		eShop		—	—	4	6	9.9	72	10	0.07	0.045
10M	eShop		eShop		5	10	4	6	4.9	100	10	0.05	0.035
12	eShop		eShop		—	—	4	6	11.9	83	12	0.08	0.055
12M	eShop		eShop		6	12	4	6	5.9	120	12	0.06	0.045
16	eShop		eShop		—	—	4	6	15.8	93	16	0.1	0.07

Ø h6 D _c	11X	208166	11X	208168	No. of teeth Z	Dimension S	L	Ø D _s	< 900 N f _z
		Solid carbide deburrer							
				60°					
mm		TiAlN				mm	mm	mm	mm
6		eShop		eShop	6	5.9	57	6	0.03
8		eShop		eShop	6	7.9	63	8	0.04
10		eShop		eShop	6	9.9	72	10	0.05
12		eShop		eShop	6	11.9	83	12	0.06
16		–		eShop	8	15.8	92	16	0.08
20		–		eShop	8	19.9	104	20	0.1



Garant Solid carbide forward / reverse corner rounding cutter

Extra long shank.

Double ground head **with quadrant profile.**

Tolerance: Size = Radius $r \pm 0.05$ mm.

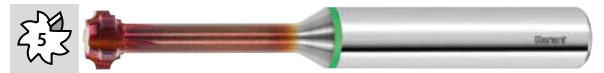
Application: For **front** and **back deburring** of edges with contours.

208172 – For **universal application** in virtually all materials.

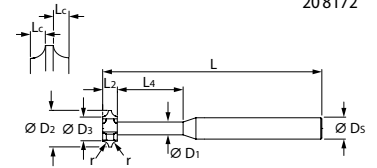
The newly developed coating **effectively prevents formation of built-up edges** – even in aluminium and stainless steel.



208170



208172



Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
208170		115	70	65	65	40	35							35	30		40	○		●	○	●	●
208172		125	75	70	70	45	40							35	30		45	●		●	○	●	●

Radius r	11X	208170	11X	208172	$\varnothing D_3$	$\varnothing D_2$	$L_2 + 0.5$	$L_4 + 0.5$	$\varnothing D_1 + 0.05$	L_c	L	$\varnothing D_5$	f_z
		Solid carbide forward / reverse corner rounding cutter											
mm		TiAlN		TiAlN	mm	mm	mm	mm	mm	mm	mm	mm	mm
0,2		eShop		eShop	7.6	8	2	26	6	0.2	100	6	8
0,3		eShop		eShop	7.4	8	2	26	6	0.3	100	6	8
0,4		eShop		eShop	7.2	8	2	26	6	0.4	100	6	8
0,5		eShop		eShop	7	8	2	26	6	0.5	100	6	8
0,8		eShop		eShop	8.4	10	4	31	6	0.8	100	6	10
1		eShop		eShop	8	10	4	31	6	1	100	6	10
1,2		eShop		eShop	7.6	10	5	31	6	1.2	100	6	10
1,5		eShop		eShop	7	10	5	31	6	1.5	100	6	10
1,8		eShop		eShop	8.4	12	6	37	6	1.8	100	6	12
2		eShop		eShop	8	12	7	37	6	2	100	6	12
2,5		eShop		eShop	7	12	8	37	6	2.5	100	6	12



Garant Solid carbide forward / reverse deburring tool

Extra long shank.

Double ground head **with 45° angle.**

Application: For **forward** and **reverse deburring** and **chamfering** even where access is difficult. Particularly suitable for **contouring applications**.

208185 – For **universal application** in virtually all materials.

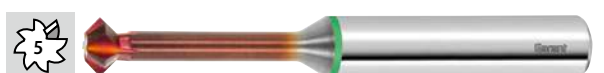
The newly developed coating **effectively prevents formation of built-up edges** – even in aluminium and stainless steel.



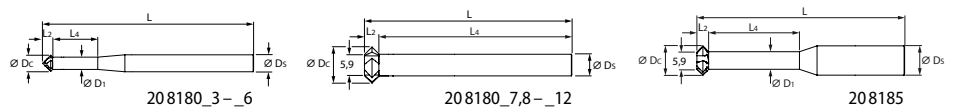
208180_3-6



208180_7.8-12



208185



208180_3-6

208180_7.8-12

208185

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10% Si	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
208180		115	70	65	65	40	35							35	30		40	○		●	○	●	●
208185		125	75	70	70	45	40							35	30		45	●		●	○	●	●

Ø D _c	11X 20 8180		11X 20 8185		L ₂ +0.5	L ₄ +0.5		Ø D ₁ +0.05		L	Shape	Ø D _s		 < 900 N f _z
	Solid carbide forward / reverse deburring tool													
	mm	TiAlN		TiAlN		mm	20 8180	20 8185	20 8180			20 8185	mm	
3	eShop		—	2	10	—	2.2	—	75	pointed	4	—	0.01	
3,8	eShop		—	2.7	13	—	2.9	—	75	pointed	4	—	0.01	
4	eShop		—	2.7	13	—	2.9	—	75	pointed	4	—	0.01	
4,8	eShop		—	3	15	—	3.9	—	75	pointed	5	—	0.01	
5	eShop		—	3	15	—	3.9	—	75	pointed	5	—	0.01	
5,8	eShop		—	4	15	—	3.9	—	100	pointed	6	—	0.01	
6	eShop		—	4	15	—	3.9	—	100	pointed	6	—	0.01	
7,8	eShop		eShop	2	98	26	—	6	100	flat	6	8	0.012	
8	eShop		eShop	2	98	26	—	6	100	flat	6	8	0.012	
9,8	eShop		eShop	4	96	31	—	6	100	flat	6	10	0.014	
10	eShop		eShop	4	96	31	—	6	100	flat	6	10	0.014	
11,8	eShop		eShop	6	94	37	—	6	100	flat	6	12	0.017	
12	eShop		eShop	6	94	37	—	6	100	flat	6	12	0.017	



Garant Solid carbide forward and reverse deburring tool with helix angle

Extra-long shank.

Double ground head with 45° angle.

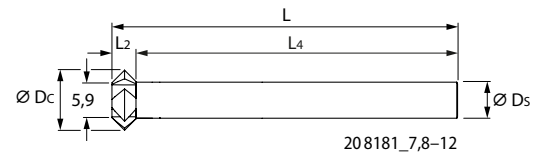
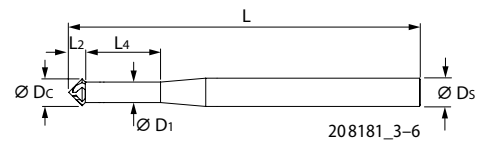
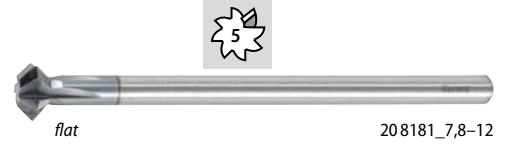
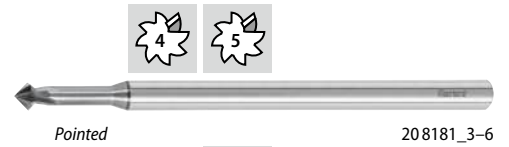
The **helix angle ground into the head on both sides** produces a **much softer cut** and thus an **excellent surface quality**. For **universal application** in virtually all materials. The newly developed coating **effectively prevents the formation of built-up edges** – even in aluminium and corrosion-resistant steels (INOX).

Size 3–6 – Pointed version

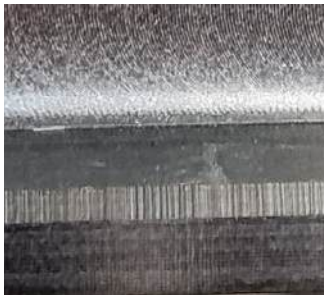
Size 7,8–12 – Flat version

Application: For **forward** and **reverse deburring** and **chamfering** even where access is difficult. Particularly suitable for **contouring applications**.

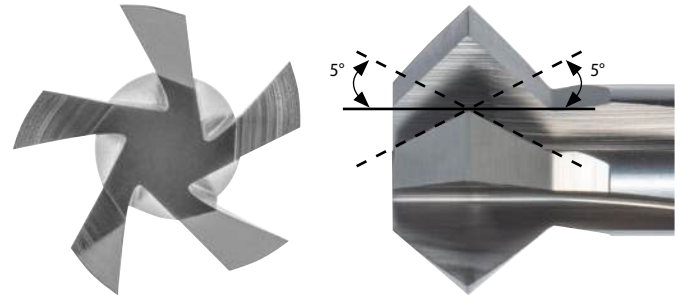
Note: Successor product to No. 208180.



Material C45 machined with 208180.



Material C45 machined with 208181.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
208181		130	80	75	75	50	45							40	30	20	50						

Ø D _c	208181	No. of teeth Z	L ₂ +0.5	L ₄ +0.5	Ø D ₁ +0.05	L	Shape	Ø D _s	f _z
mm	TiSiN		mm	mm	mm	mm		mm	mm
3	eShop	4	2	10	2.2	75	Pointed	4	0.025
3,8	eShop	4	2.7	13	2.9	75	Pointed	4	0.03
4	eShop	4	2.7	13	2.9	75	Pointed	4	0.03
4,8	eShop	5	3	15	3.9	75	Pointed	5	0.035
5	eShop	5	3	15	3.9	75	Pointed	5	0.035
5,8	eShop	5	4	15	3.9	100	Pointed	6	0.04
6	eShop	5	4	15	3.9	100	Pointed	6	0.04
7,8	eShop	5	2	98	6	100	Flat	6	0.045
8	eShop	5	2	98	6	100	Flat	6	0.045
9,8	eShop	5	4	96	6	100	Flat	6	0.05
10	eShop	5	4	96	6	100	Flat	6	0.05
11,8	eShop	5	6	94	6	100	Flat	6	0.055
12	eShop	5	6	94	6	100	Flat	6	0.055



Garant Solid carbide milling cutter

Large flutes for unobstructed swarf evacuation.

Special geometry for machining plastic.

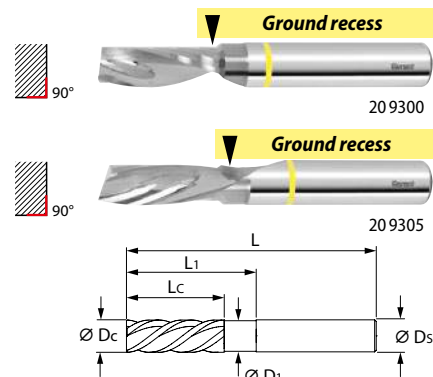
20 9305 – Left-hand flutes, right-hand cutting.

Application: Especially for milling plastics, plunging and contour milling.

Note:

20 9300 – Successor product to No. 209310.

20 9305 – Successor product to No. 209315.



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	cast	cast	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
	> 10 % Si	> 10 % Si	> 10 % Si													sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 9300/9305	180	140	105	190	140	160	140	120								180	150	180					

$\emptyset$ h10 D _c	11X	20 9300	11X	20 9305	L _c	L ₁	$\emptyset$ D ₁	L	$\emptyset$ D _s		
		Solid carbide slot drill									
mm		Left-hand flutes			mm	mm	mm	mm	mm		
1,5		eShop		eShop	6	10	1.3	50	3	0.004	
2		eShop		eShop	8	12	1.8	50	3	0.008	
3		eShop		eShop	12	17	2.8	50	3	0.008	
4		eShop		eShop	15	20	3.8	60	4	0.015	
5		eShop		eShop	17	22	4.8	60	5	0.015	
6		eShop		eShop	20	25	5.8	65	6	0.025	
8		eShop		eShop	22	27	7.8	70	8	0.03	
10		eShop		eShop	25	32	9.8	75	10	0.04	
12		eShop		eShop	30	38	11.8	83	12	0.05	

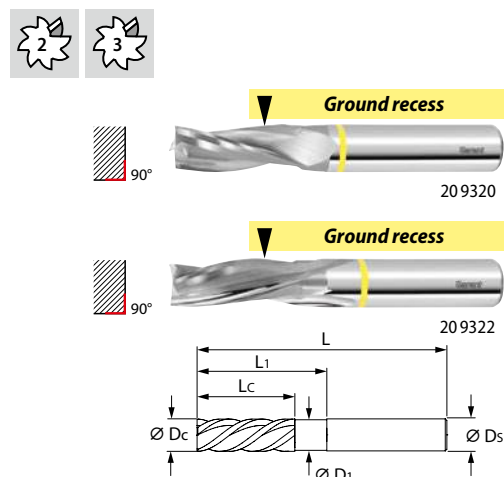


Garant Solid carbide milling cutter

Special geometry for machining aluminium and plastics.

20 9322 – Left-hand flutes, right-hand cutting.

Application: Extremely sharp cutting edges, especially for machining plastics.



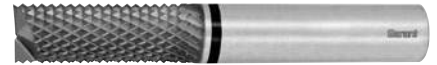
Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	AFRP	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Honey-	Cu	CuZn					
	cast	cast	cast	acrylic					aramid	GF20	GF25	GF30	GF30	CF25	CF30	comb							
	> 10 % Si	> 10 % Si	> 10 % Si													sandwich							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 9320/9322	180	140	105	190	140	160	140	120								180	150	180					

$\emptyset$ e8 D _c	11X	20 9320	11X	20 9322	No. of teeth Z	L _c	L ₁	$\emptyset$ D ₁	L	$\emptyset$ D _s		
		Solid carbide slot drill										
mm		Left-hand flutes				mm	mm	mm	mm	mm		
4		eShop		eShop	2	13	16	3.8	54	4	0.015	0.02
5		eShop		eShop	2	15	18	4.8	54	5	0.015	0.02
6		eShop		eShop	2	16	21	5.8	64	6	0.025	0.03
8		eShop		eShop	2	22	27	7.8	70	8	0.03	0.04
10		eShop		eShop	2	25	32	9.8	72	10	0.04	0.05
12		eShop		eShop	3	28	38	11.8	83	12	0.05	0.07
14		eShop		—	3	30	42	13.8	83	14	0.05	0.07
16		eShop		eShop	3	36	44	15.8	92	16	0.065	0.09
20		eShop		eShop	3	41	54	19.8	104	20	0.085	0.12

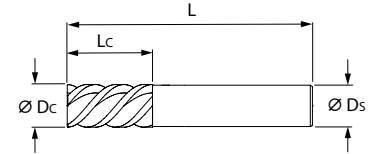


Garant Solid carbide router cutter for GRP and CRP

High performance diamond-pattern cut for efficient roughing of fibre-reinforced composites.



209512



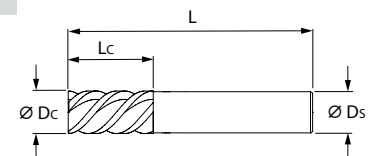
Suitable for/ v_c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	CRP	Graphite GRP CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
209512							200	190	170	150	180	160	●				190	190		●	●	●	●

$\varnothing h10 D_c$	TOY	20 9512	L_c	L	$\varnothing D_s$	
mm		Solid carbide router cutter compacting cut	mm	mm	mm	f mm/rev.
		fine				
		Diamond				
4		eShop	16	50	4	0.21
5		eShop	16	50	5	0.21
6		eShop	19	60	6	0.28
8		eShop	25	63	8	0.35
10		eShop	25	72	10	0.42
12		eShop	32	83	12	0.42
16		eShop	36	92	16	0.49
20		eShop	45	104	20	0.56

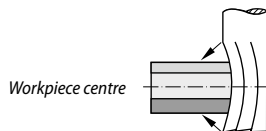


Garant Solid carbide milling cutter for GRP, CRP, and graphite

Twisted and curved cutting edges, which enable burr-free milling of both the upper and lower edges of fibre-reinforced composites. Delamination is prevented because the cutter performs a cut which is simultaneously dragging and compacting. The cutter must be positioned centrally to the cross section of the material.



209515



The helical curved flute profile prevents delamination and permits burr-free milling.



209517

Suitable for/ v_c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
209515/9517							200	190	170	150	180	160	●	350			190	190	340	●	●	●	●

Ø h10 D _c	10Y	20 9515	10Y	20 9517	No. of teeth Z	L _c		Cutting section drag- ging L _A		L		Ø D _s	 GRP CRP f _z
	Solid carbide milling cutter					20 9515	20 9517	20 9515	20 9517	20 9515	20 9517		
mm	Diamond		Diamond			mm	mm	mm	mm	mm	mm	mm	mm
6	eShop		eShop		4	16	21	8	10	58	65	6	0.06
8	eShop		eShop		6	22	28	11	14	70	85	8	0.07
10	eShop		eShop		6	25	32	12	16	73	85	10	0.08
12	eShop		eShop		6	28	36	14	18	84	93	12	0.1

20

GARANT COMPOSITE SOLID CARBIDE MILLING CUTTERS.

The highest performance for composite materials.

GARANT Composite solid carbide milling cutter

+100%

- Tool life **plus 100 %**.
- **Extremely improved** smooth running.
- **4x higher** cutting quality.

+100%

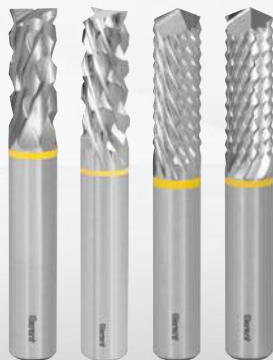
- Tool life **plus 100 %**.
- **Increased** smooth running.
- **Twice the** cutting quality.

Uncoated

Diamond-coated

Compared to GARANT router tools, our GARANT composite solid carbide milling cutters are especially designed for the machining of composite materials and offer a longer tool life and higher metal removal rate.

GARANT router tools



20 9410 / 20 9420 / 20 9415 / 20 9435



20 9542

20 9540



20 9548

20 9546

The further development of the GARANT composite cutters guarantees clear advantages:

+30%

Increased productivity

- Problem-solver in unfavourable process conditions.
- Extreme cutting edge sharpness for excellent cutting quality.

**Optimum
cutting edge quality**

-40%

Reduced axial forces

- Process conditions, ideal for use in hard-to-machine outer layers.
- Increased layer thickness for maximum tool lives.

**Very high
productivity**



Garant Solid carbide milling cutter Composite

Specifically **developed Tool cutting edge has been specifically developed further** for optimum machining of composite materials.

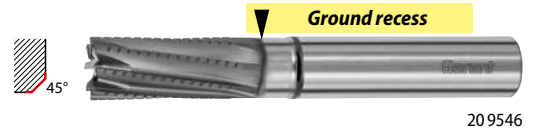
Length similar to **DIN 6527 long**.

20 9540/9546 – Right-hand helix, **dragging cut** for standard applications.

20 9542/9548 – Left-hand helix, **compacting cut**. The material is pushed down on to the substrate. Highly suitable for thin materials.



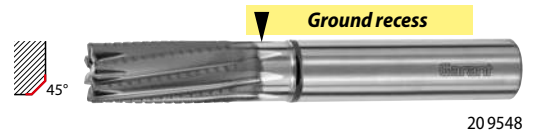
20 9540



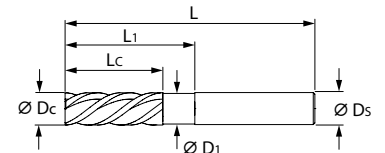
20 9546



20 9542



20 9548



Suitable for/ v_c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	CRP	GRP CRP	Graphite					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 9540/9542							80	80	80	80	80	80	●	165		120	120	180		●	●	●	●
20 9546/9548							100	100	100	100	100	100	●	195		145	145	200		●	●	●	●

Ø h10 D _c	100	20 9540	100	20 9546	100	20 9542	100	20 9548	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°	
		Solid carbide milling cutter Composite, dragging cut				Solid carbide milling cutter Composite, compacting cut									GRP CRP
		uncoated	Diamond			uncoated	Diamond								f _z
mm									mm	mm	mm	mm	mm	mm	mm
4		eShop	eShop			eShop	eShop		11	19	3.9	57	6	0.08	0.021
5		eShop	eShop			eShop	eShop		13	19	4.9	57	6	0.1	0.021
6		eShop	eShop			eShop	eShop		13	19	5.8	57	6	0.12	0.026
6M		eShop	eShop			eShop	eShop		21	27	5.8	65	6	0.12	0.026
8		eShop	eShop			eShop	eShop		19	25	7.8	63	8	0.16	0.031
8M		eShop	eShop			eShop	eShop		22	32	7.8	70	8	0.16	0.031
10		eShop	eShop			eShop	eShop		22	30	9.7	72	10	0.2	0.035
12		eShop	eShop			eShop	eShop		26	36	11.6	83	12	0.24	0.038
16		eShop	eShop			eShop	eShop		32	42	15.5	92	16	0.32	0.042

- Quick application-related tool selection.
- Direct ordering in the eShop.
- Manufacturer and standard-related tool selection.
- Cutting data - direct selection.
- Tool information for reliable engineering.

You can find optimum cutting data, machining strategy and NC programs for your machine programming in the ThreadScout.





Garant PCD slot drill with internal cooling

High performance PCD slot drill for high metal removal rates.

20 9800 – Axial angle 0°.

Straight flutes for a neutral cut.

20 9801 Size 3–8 – Axial angle positive. $\alpha = 2^\circ$.

Dragging cut for standard applications.

20 9801 Size 10–16 – Axial angle positive. $\alpha = 4^\circ$.

Dragging cut for standard applications.

20 9802 Size 3–8 – Axial angle negative. $\alpha = -2^\circ$.

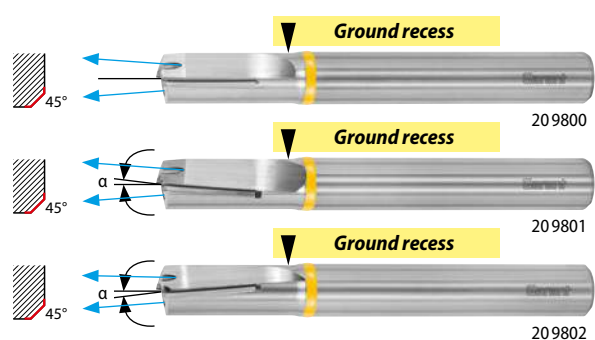
Compacting cut.

The material is pushed down on to the substrate. Highly suitable for thin materials.

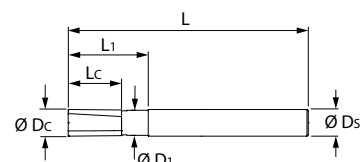
20 9802 Size 10–16 – Axial angle negative. $\alpha = -4^\circ$.

Compacting cut.

The material is pushed down on to the substrate. Highly suitable for thin materials.



Improved version!



Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	MMC	GRP	CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 9800–20 9802	2400	2000	1500	1000	900	900	800		1200	1200	1000	1000	1000	800		400	500	500					
$\varnothing$ h10 D _c	100	20 9800	100	20 9801	100	20 9802			L _c	L ₁	$\varnothing$ D ₁	L	$\varnothing$ D ₃	Corner chamfer width at 45°									
	PCD slot drill with internal cooling																						
	straight cut		dragging cut		compacting cut																		
mm	PCD		PCD		PCD																		
3	eShop		eShop		eShop			2.5	15	2.8	60	6	0.1	0.01	0.05	0.02	0.05						
4	eShop		eShop		eShop			2.5	15	3.8	60	6	0.1	0.01	0.07	0.02	0.07						
5	eShop		eShop		eShop			3	15	4.6	60	6	0.1	0.02	0.09	0.03	0.09						
6	eShop		eShop		eShop			15	20	5.4	60	6	0.1	0.03	0.1	0.04	0.1						
8	eShop		eShop		eShop			20	30	7.4	80	8	0.1	0.04	0.11	0.05	0.11						
10	eShop		eShop		eShop			20	30	9.4	90	10	0.1	0.06	0.12	0.07	0.12						
12	eShop		eShop		eShop			20	30	11	100	12	0.1	0.08	0.14	0.09	0.14						
16	eShop		eShop		eShop			20	30	15	125	16	0.1	0.1	0.15	0.11	0.15						

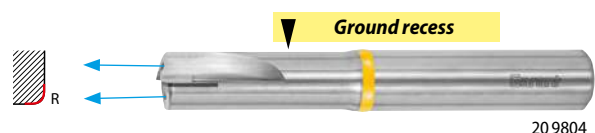


Garant PCD torus cutter with internal cooling

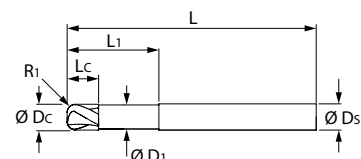
High performance PCD slot drill for high metal removal rates.

Straight flutes for a neutral cut.

Tolerance for corner radius $R_1 = \pm 0.01$ mm.



Improved version!

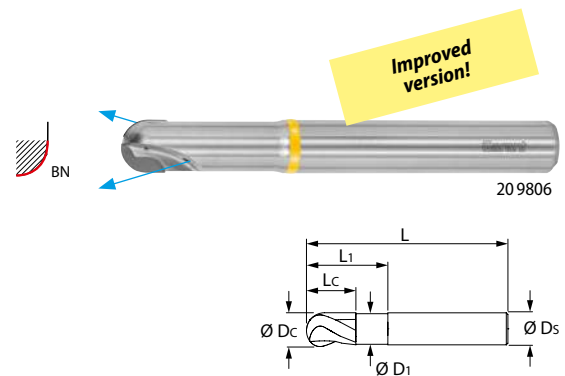


Suitable for/ v_c [m/min]	Alu	Alu	Alu	PMMA	PE-HD	PA 66	PEEK	PF 31	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	MMC	GRP	CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 9804	2400	2000	1500	1000	900	900	800		1200	1200	1000	1000	1000	800		400	500	500					
$\varnothing$ e8 D _c / R ₁	100	20 9804							L _c	R ₁	L ₁	$\varnothing$ D ₁	L	$\varnothing$ D ₃									
	PCD torus cutter with internal cooling																						
	straight cut		dragging cut		compacting cut																		
mm	PCD		PCD		PCD																		
3/0,3	eShop		eShop		eShop			2.5	0.3	14	2.8	50	6	0.03	0.06	0.05	0.1						
4/0,5	eShop		eShop		eShop			2.5	0.5	14	3.8	50	6	0.03	0.06	0.05	0.1						
5/0,5	eShop		eShop		eShop			3	0.5	18	4.6	54	6	0.04	0.07	0.07	0.12						
6/0,5	eShop		eShop		eShop			6	0.5	21	5.5	57	6	0.04	0.07	0.07	0.12						
6/1,0	eShop		eShop		eShop			6	1	21	5.5	57	6	0.04	0.07	0.07	0.12						
8/0,5	eShop		eShop		eShop			7	0.5	27	7.4	63	8	0.05	0.09	0.08	0.14						
10/0,5	eShop		eShop		eShop			8	0.5	32	9.2	72	10	0.06	0.1	0.09	0.14						
10/1,0	eShop		eShop		eShop			8	1	32	9.2	72	10	0.06	0.1	0.09	0.14						



Garant PCD ball nose slot drill with internal cooling

High-performance PCD slot drill for the highest demands in respect to material removal rates. Straight flutes for a neutral cut.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	MMC	GRP	CRP					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 9806	2400	2000	1500	1000	900	900	800		1200	1200	1000	1000	1000	800	●	400	500	500		●	●	●	●

Ø e8 D _c	100	20 9806	L _c	L ₁	Ø D ₁	L	Ø D _s	 Alu cast > 10 % Si f _z	 Graphite f _z	 Alu cast > 10 % Si f _z	 Graphite f _z
		PCD ball nose slot drill with internal cooling									
		straight cut									
mm		PCD	mm	mm	mm	mm	mm	mm	mm	mm	mm
3		eShop	2.5	9	2.8	60	6	0.03	0.06	0.05	0.1
4		eShop	2.5	15	3.8	60	6	0.03	0.06	0.05	0.1
5		eShop	3	15	4.6	60	6	0.04	0.08	0.07	0.12
6		eShop	6	15	5.5	80	6	0.04	0.08	0.07	0.12
8		eShop	10	20	7.4	80	8	0.05	0.09	0.08	0.14
10		eShop	10	26	9.4	80	10	0.06	0.1	0.09	0.14
12		eShop	10	35	11.2	100	12	0.06	0.1	0.09	0.14
16		eShop	10	35	15	125	16	0.07	0.11	0.1	0.15



Garant PCD milling cutter with internal cooling

High-performance PCD milling cutter designed for high-volume machining. High rigidity due to conical design. Very well suited for structural components made of aluminium. Axial angle approx. 10° positive.

Size 16 – Taper transition with 2.2° (angle α).

Size 20 – Taper transition with 1.5° (angle α).



Suitable for/ v _c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
										GF20	GF25	GF30	GF30	CF25	CF30								
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 9808	900	900	900	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		900	900	●	●	●	●	●

Ø D _c	111	20 9808	L _c	R ₁	L ₁	Ø D ₁	L	Ø D _s	L ₂	Ø D ₂	
		PCD milling cutter with internal cooling									Alu cast > 10 % Si
		HPC									f _z
mm		PCD	mm	mm	mm	mm	mm	mm	mm	mm	mm
16		eShop	11.4	3	19.6	12.8	105	16	56	15.5	0.2
20		eShop	14.2	3	22.6	17	120	20	70	19.4	0.2



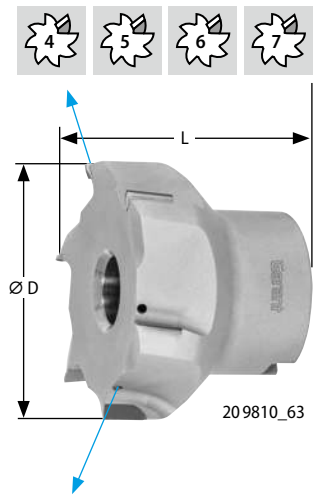
Garant PCD face mill

High-performance PCD face mill for roughing and finish machining. Generous flutes for reliable evacuation of the chips. Coolant directly on the cutting edge. Axial angle 6° positive.

Supplied with: Special fastening screw for optimal coolant feed.

Note: Matching face mill arbors are located in the clamping device area, e.g. No. 306530
22. PCD face mill with corner radius 0.1 mm – 1.5 mm are available on request.

new sizes



Suitable for/ v _c [m/min]	Alu 	Alu 	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF	POM	PA 66	PEEK	PTFE	PEEK	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 9810	6000	6000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	6000	2000	●	●	●	●	●

Ø D	20 9810			L	Bore Ø	No. of teeth Z	Corner chamfer width at 45°	
	PCD face mill							
	with bore							
mm	PCD			mm			mm	mm
32	(eShop)			40	16	4	0.1	0.2
40	(eShop)			40	16	4	0.1	0.2
50	eShop			48	22	5	0.1	0.2
63	eShop			48	22	6	0.1	0.2
80	(eShop)			50	27	7	0.1	0.2



Garant Solid carbide micro precision slot drill for CRP, GRP and graphite

With **crystalline diamond sp³ coating**. For the **highest demands regarding performance and precision** in fibre-reinforced composites, CRP, GRP, and graphite. **Extremely tight tolerances** ensure maximum accuracy. Double relief ground with 2 hollow-ground chamfers. **Recess angle α = 16°**.

Tolerances:

■ Neck Ø: D₁ = 0 / -0.01 mm.

Note: At greater tool overhang lengths, use a reduced value for a_p!

Values for:

slots milled from solid: a_p = 0.1 × D × a_{p,corr}

side milling: a_p = 0.2 × D × a_{p,corr}

To calculate the feed rate vf please use the actual speed of the machine (the maximum possible speed)!

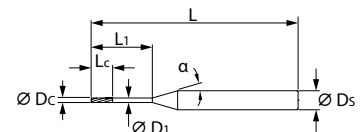
e.g. vf = 18000 [rpm] × fz [mm/Z] × z



Ground recess



≤ 0.8 mm ≥ 1 mm



Suitable for/ v _c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite						
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N						
20 9700							200	190	170	150	180	160	●	350			190	190	340			●	●	●

Ø D _c × L ₁	10Y	20 9700	L _c	L ₁	Ø D ₁	L	Ø D _s			Correction factor a _{p,corr}
		Solid carbide micro slot drill						f _z	f _z	
mm		Diamond	mm	mm	mm	mm	mm	mm	mm	
0,1×0,3		eShop	0.15	0.3	0.08	45	4	0.008	0.012	1
0,1×0,5		eShop	0.15	0.5	0.08	45	4	0.008	0.012	1
0,1×1		eShop	0.15	1	0.08	45	4	0.005	0.007	0.5
0,2×0,5		eShop	0.3	0.5	0.18	45	4	0.008	0.012	1
0,2×1		eShop	0.3	1	0.18	45	4	0.008	0.012	1
0,2×2		eShop	0.3	2	0.18	45	4	0.005	0.007	0.5
0,2×3		eShop	0.3	3	0.18	45	4	0.005	0.007	0.2

$\varnothing D_c \times L_1$	10Y	20 9700	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$			Correction factor $a_{p, corr}$
mm		Solid carbide micro slot drill	mm	mm	mm	mm	mm	f_z	f_z	
0,3×1		eShop	0.4	1	0.28	45	4	0.012	0.016	1
0,3×2		eShop	0.4	2	0.28	45	4	0.012	0.016	0.9
0,3×4		eShop	0.4	4	0.28	45	4	0.008	0.012	0.35
0,3×6		eShop	0.4	6	0.28	45	4	0.005	0.007	0.08
0,4×2		eShop	0.6	2	0.38	45	4	0.012	0.016	1
0,4×4		eShop	0.6	4	0.38	45	4	0.008	0.012	0.5
0,4×6		eShop	0.6	6	0.38	45	4	0.008	0.012	0.2
0,4×8		eShop	0.6	8	0.38	45	4	0.005	0.007	0.08
0,5×2		eShop	0.7	2	0.48	45	4	0.016	0.02	1
0,5×4		eShop	0.7	4	0.48	45	4	0.016	0.02	0.8
0,5×6		eShop	0.7	6	0.48	45	4	0.012	0.016	0.35
0,5×8		eShop	0.7	8	0.48	45	4	0.012	0.016	0.12
0,5×10		eShop	0.7	10	0.48	45	4	0.008	0.012	0.08
0,5×12		eShop	0.7	12	0.48	50	4	0.008	0.012	0.04
0,6×2		eShop	0.9	2	0.58	45	4	0.016	0.02	1
0,6×4		eShop	0.9	4	0.58	45	4	0.016	0.02	0.9
0,6×6		eShop	0.9	6	0.58	45	4	0.012	0.016	0.5
0,6×8		eShop	0.9	8	0.58	45	4	0.012	0.016	0.35
0,6×10		eShop	0.9	10	0.58	50	4	0.012	0.016	0.12
0,6×15		eShop	0.9	15	0.58	60	4	0.008	0.012	0.04
0,8×4		eShop	1.2	4	0.78	45	4	0.016	0.02	1
0,8×6		eShop	1.2	6	0.78	45	4	0.016	0.02	0.8
0,8×8		eShop	1.2	8	0.78	45	4	0.012	0.016	0.8
0,8×10		eShop	1.2	10	0.78	50	4	0.012	0.016	0.35
0,8×15		eShop	1.2	15	0.78	60	4	0.012	0.016	0.08
0,8×20		eShop	1.2	20	0.78	60	4	0.008	0.012	0.04
1×4		eShop	1.5	4	0.95	45	4	0.025	0.03	1
1×6		eShop	1.5	6	0.95	45	4	0.025	0.03	0.9
1×8		eShop	1.5	8	0.95	45	4	0.025	0.03	0.8
1×10		eShop	1.5	10	0.95	50	4	0.02	0.025	0.5
1×12		eShop	1.5	12	0.95	50	4	0.02	0.025	0.35
1×15		eShop	1.5	15	0.95	50	4	0.02	0.025	0.2
1×20		eShop	1.5	20	0.95	60	4	0.016	0.02	0.08
1×25		eShop	1.5	25	0.95	70	4	0.016	0.02	0.04
1×30		eShop	1.5	30	0.95	70	4	0.012	0.016	0.02
1,2×5		eShop	1.8	5	1.14	45	4	0.025	0.03	1
1,2×10		eShop	1.8	10	1.14	45	4	0.025	0.03	0.8
1,2×15		eShop	1.8	15	1.14	50	4	0.02	0.025	0.35
1,2×20		eShop	1.8	20	1.14	60	4	0.02	0.025	0.12
1,2×25		eShop	1.8	25	1.14	70	4	0.016	0.02	0.04
1,2×30		eShop	1.8	30	1.14	70	4	0.012	0.016	0.04
1,4×6		eShop	2.1	6	1.34	45	4	0.025	0.03	1
1,5×5		eShop	2.3	5	1.44	45	4	0.025	0.03	1
1,5×10		eShop	2.3	10	1.44	45	4	0.025	0.03	0.9
1,5×15		eShop	2.3	15	1.44	50	4	0.02	0.025	0.5
1,5×20		eShop	2.3	20	1.44	60	4	0.02	0.025	0.35
1,5×25		eShop	2.3	25	1.44	60	4	0.02	0.025	0.12
1,5×30		eShop	2.3	30	1.44	70	4	0.016	0.02	0.08
1,6×5		eShop	2.4	5	1.51	45	4	0.025	0.03	1
1,6×10		eShop	2.4	10	1.51	45	4	0.025	0.03	0.9
1,6×15		eShop	2.4	15	1.51	50	4	0.02	0.025	0.5
1,6×20		eShop	2.4	20	1.51	60	4	0.02	0.025	0.35
1,8×6		eShop	2.7	6	1.71	45	4	0.03	0.035	1
2×5		eShop	3	5	1.91	45	4	0.03	0.035	1
2×6		eShop	3	6	1.91	45	4	0.03	0.035	1
2×10		eShop	3	10	1.91	45	4	0.03	0.035	1
2×15		eShop	3	15	1.91	50	4	0.03	0.035	0.8
2×20		eShop	3	20	1.91	60	4	0.025	0.03	0.5
2×25		eShop	3	25	1.91	60	4	0.025	0.03	0.35
2×30		eShop	3	30	1.91	70	4	0.025	0.03	0.2
2×40		eShop	3	40	1.91	80	4	0.02	0.025	0.08
2×50		eShop	3	50	1.91	90	4	0.02	0.025	0.08
2,5×8		eShop	3.7	8	2.41	45	4	0.03	0.035	1
2,5×5		eShop	3.7	5	2.41	45	4	0.03	0.035	1
2,5×10		eShop	3.7	10	2.41	45	4	0.03	0.035	1
2,5×12		eShop	3.7	12	2.41	45	4	0.03	0.035	1
2,5×15		eShop	3.7	15	2.41	50	4	0.03	0.035	0.9
2,5×20		eShop	3.7	20	2.41	60	4	0.03	0.035	0.8
2,5×25		eShop	3.7	25	2.41	60	4	0.025	0.03	0.5
2,5×30		eShop	3.7	30	2.41	70	4	0.025	0.03	0.35
2,5×40		eShop	3.7	40	2.41	80	4	0.02	0.025	0.12
2,5×50		eShop	3.7	50	2.41	90	4	0.016	0.02	0.04
3×15		eShop	4.5	15	2.91	50	4	0.03	0.035	1
3×20		eShop	4.5	20	2.91	60	4	0.03	0.035	0.9
3×25		eShop	4.5	25	2.91	60	4	0.03	0.035	0.8
3×30		eShop	4.5	30	2.91	70	4	0.025	0.03	0.5
3×40		eShop	4.5	40	2.91	80	4	0.025	0.03	0.35
3×50		eShop	4.5	50	2.91	90	4	0.025	0.03	0.35
3×60		eShop	4.5	60	2.91	100	4	0.02	0.025	0.04



Garant Solid carbide milling cutter for GRP, CRP, and graphite

With the latest generation of **crystalline diamond coating sp³**, for process reliability in machining **fibre-reinforced composites, CRP, GRP, and graphite**.

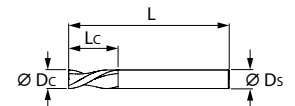
Dynamic cutter geometry.

Relief ground with 2 hollow-ground chamfers.

High-precision and stable version due to the 15° helix angle.



209711



Suitable for/ v _c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
209711							200	190	170	150	180	160	●	350		190	190	340			●	●	●

Ø h10 D _c	10Y	20 9711	L _c	L	Ø D _s	Corner chamfer width at 45°		
mm		Solid carbide slot drill	mm	mm	mm	mm	mm	mm
		Diamond						
3		eShop	8	57	6	0.06	0.03	0.03
4		eShop	11	57	6	0.08	0.03	0.03
5		eShop	13	57	6	0.1	0.03	0.03
6		eShop	13	57	6	0.12	0.04	0.04
8		eShop	19	63	8	0.16	0.05	0.05
10		eShop	22	72	10	0.2	0.06	0.06
12		eShop	26	83	12	0.2	0.06	0.06
16		eShop	32	92	16	0.2	0.07	0.07
20		eShop	38	104	20	0.2	0.08	0.08



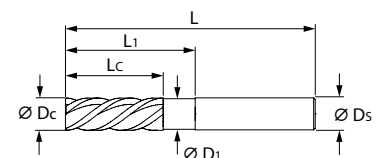
Garant Solid carbide milling cutter for GRP, CRP, and graphite

With the latest generation of **crystalline diamond coating sp³**, for process reliability in machining **fibre-reinforced composites, CRP, GRP, and graphite**.

Dynamic cutter geometry.

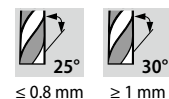


209713



Suitable for/ v _c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
209713							200	190	170	150	180	160	●	350		190	190	340			●	●	●

Ø f8 D _c	10Y	20 9713	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°		
mm		Solid carbide milling cutter	mm	mm	mm	mm	mm	mm	mm	mm
		Diamond								
6		eShop	13	19	5.9	57	6	0.1	0.04	0.04
8		eShop	19	25	7.8	63	8	0.2	0.05	0.05
10		eShop	22	30	9.7	72	10	0.2	0.06	0.06
12		eShop	26	36	11.7	83	12	0.3	0.06	0.06
16		eShop	32	42	15.5	92	16	0.3	0.07	0.07
20		eShop	38	52	19.5	104	20	0.3	0.08	0.08



Garant Solid carbide micro precision torus cutter for CRP, GRP and graphite

With **crystalline diamond sp³ coating**. For the **highest demands regarding performance and precision** in fibre-reinforced composites, CRP, GRP, and graphite. **Extremely tight tolerances** ensure maximum accuracy. Double relief ground with 2 hollow-ground chamfers.

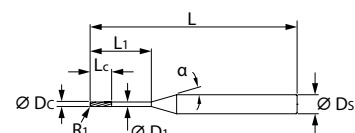
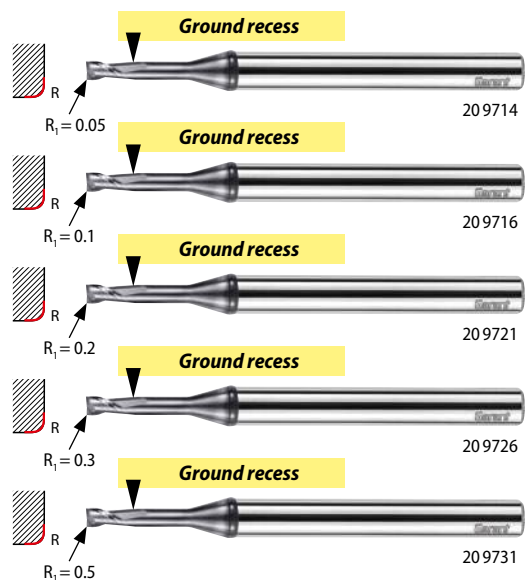
Recess angle $\alpha = 16^\circ$.

Tolerances:

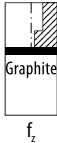
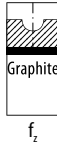
■ Corner radius: $R_1 = \pm 0.0025 \text{ mm}$

■ Neck $\varnothing$: $D_1 = 0 / -0.01 \text{ mm}$

Note: At greater tool overhang lengths, use a reduced value for a_p !
 Values for:
 copying: $a_p = 0.10 \times D \times a_{p \text{ corr}}$
 side milling: $a_p = 0.20 \times D \times a_{p \text{ corr}}$
To calculate the feed rate v_f please use the actual speed of the machine (the maximum possible speed)!
 e.g. $v_f = 18000 [\text{rpm}] \times f_z [\text{mm/Z}] \times z$



Suitable for/ v _c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
209714–209731							200	190	170	150	180	160	●	350		190	190	340			●	●	●

$\varnothing D_c \times L_1$	10Y	10Y	10Y	10Y	10Y	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$			Correction factor a_p corr
	Solid carbide torus cutter												
	R_1 0.05	R_1 0.1	R_1 0.2	R_1 0.3	R_1 0.5								
	Diamond	Diamond	Diamond	Diamond	Diamond								
mm						mm	mm	mm	mm	mm	mm	mm	
0,2×1	eShop	—	—	—	—	0.2	1	0.18	50	4	0.012	0.012	1
0,2×2	eShop	—	—	—	—	0.2	2	0.18	50	4	0.007	0.007	0.5
0,2×3	eShop	—	—	—	—	0.2	3	0.18	50	4	0.007	0.007	0.2
0,3×1	eShop	—	—	—	—	0.3	1	0.28	50	4	0.016	0.016	1
0,3×2	eShop	—	—	—	—	0.3	2	0.28	50	4	0.016	0.016	0.9
0,3×4	eShop	—	—	—	—	0.3	4	0.28	50	4	0.012	0.012	0.35
0,3×6	eShop	—	—	—	—	0.3	6	0.28	50	4	0.007	0.007	0.08
0,4×2	eShop	eShop	—	—	—	0.4	2	0.38	50	4	0.016	0.016	1
0,4×4	eShop	eShop	—	—	—	0.4	4	0.38	50	4	0.012	0.012	0.5
0,4×6	eShop	eShop	—	—	—	0.4	6	0.38	50	4	0.012	0.012	0.2
0,4×8	eShop	eShop	—	—	—	0.4	8	0.38	50	4	0.007	0.007	0.08
0,5×2	eShop	eShop	—	—	—	0.5	2	0.48	50	4	0.02	0.02	1
0,5×4	eShop	eShop	—	—	—	0.5	4	0.48	50	4	0.02	0.02	0.8
0,5×6	eShop	eShop	—	—	—	0.5	6	0.48	50	4	0.016	0.016	0.35
0,5×8	eShop	eShop	—	—	—	0.5	8	0.48	50	4	0.016	0.016	0.12
0,5×10	eShop	eShop	—	—	—	0.5	10	0.48	50	4	0.012	0.012	0.08
0,5×12	eShop	eShop	—	—	—	0.5	12	0.48	50	4	0.012	0.012	0.04
0,6×2	eShop	eShop	—	—	—	0.6	2	0.58	50	4	0.02	0.02	1
0,6×4	eShop	eShop	—	—	—	0.6	4	0.58	50	4	0.02	0.02	0.9
0,6×6	eShop	eShop	—	—	—	0.6	6	0.58	50	4	0.016	0.016	0.5
0,6×8	eShop	eShop	—	—	—	0.6	8	0.58	50	4	0.016	0.016	0.35

$\emptyset D_c \times L_1$	10Y 20 9714	10Y 20 9716	10Y 20 9721	10Y 20 9726	10Y 20 9731	L_c	L_1	$\emptyset D_1$	L	$\emptyset D_s$	 f_z	 f_z	Correction factor $a_{p, corr}$
	Solid carbide torus cutter												
	R₁ 0.05	R₁ 0.1	R₁ 0.2	R₁ 0.3	R₁ 0.5								
mm	Diamond	Diamond	Diamond	Diamond	Diamond	mm	mm	mm	mm	mm	mm	mm	
0,6×10	eShop	eShop	—	—	—	0.6	10	0.58	50	4	0.016	0.016	0.12
0,6×15	eShop	eShop	—	—	—	0.6	15	0.58	60	4	0.012	0.012	0.04
0,8×4	eShop	eShop	eShop	—	—	0.8	4	0.78	50	4	0.02	0.02	1
0,8×6	eShop	eShop	eShop	—	—	0.8	6	0.78	50	4	0.02	0.02	0.8
0,8×8	eShop	eShop	eShop	—	—	0.8	8	0.78	50	4	0.016	0.016	0.8
0,8×10	eShop	eShop	eShop	—	—	0.8	10	0.78	50	4	0.016	0.016	0.35
0,8×15	eShop	eShop	eShop	—	—	0.8	15	0.78	60	4	0.016	0.016	0.08
0,8×20	eShop	eShop	eShop	—	—	0.8	20	0.78	60	4	0.012	0.012	0.04
1×4	eShop	eShop	eShop	eShop	—	1	4	0.95	50	4	0.03	0.03	1
1×6	eShop	eShop	eShop	eShop	—	1	6	0.95	50	4	0.03	0.03	0.9
1×8	eShop	eShop	eShop	eShop	—	1	8	0.95	50	4	0.03	0.03	0.8
1×10	eShop	eShop	eShop	eShop	—	1	10	0.95	50	4	0.025	0.025	0.5
1×15	eShop	eShop	eShop	eShop	—	1	15	0.95	60	4	0.025	0.025	0.2
1×20	eShop	eShop	eShop	eShop	—	1	20	0.95	60	4	0.02	0.02	0.08
1×25	eShop	eShop	eShop	eShop	—	1	25	0.95	70	4	0.02	0.02	0.04
1×30	eShop	eShop	eShop	eShop	—	1	30	0.95	70	4	0.016	0.016	0.02
1,2×5	—	—	eShop	eShop	—	1.2	5	1.14	50	4	0.03	0.03	1
1,2×10	—	—	eShop	eShop	—	1.2	10	1.14	50	4	0.03	0.03	0.8
1,2×15	—	—	eShop	eShop	—	1.2	15	1.14	60	4	0.025	0.025	0.35
1,2×20	—	—	eShop	eShop	—	1.2	20	1.14	60	4	0.025	0.025	0.12
1,2×25	—	—	eShop	eShop	—	1.2	25	1.14	70	4	0.02	0.02	0.04
1,2×30	—	—	eShop	eShop	—	1.2	30	1.14	70	4	0.016	0.016	0.04
1,5×10	—	—	eShop	eShop	eShop	1.5	10	1.44	50	4	0.03	0.03	0.9
1,5×15	—	—	eShop	eShop	eShop	1.5	15	1.44	60	4	0.025	0.025	0.5
1,5×20	—	—	eShop	eShop	eShop	1.5	20	1.44	60	4	0.025	0.025	0.35
1,5×25	—	—	eShop	eShop	eShop	1.5	25	1.44	60	4	0.025	0.025	0.12
1,5×30	—	—	eShop	eShop	eShop	1.5	30	1.44	70	4	0.02	0.02	0.08
1,6×5	—	—	eShop	eShop	eShop	1.6	5	1.54	50	4	0.03	0.03	1
1,6×10	—	—	eShop	eShop	eShop	1.6	10	1.54	50	4	0.03	0.03	0.9
1,6×15	—	—	eShop	eShop	eShop	1.6	15	1.54	60	4	0.025	0.025	0.5
1,6×20	—	—	eShop	eShop	eShop	1.6	20	1.54	60	4	0.025	0.025	0.35
2×5	—	eShop	eShop	eShop	eShop	2	5	1.91	50	4	0.035	0.035	1
2×10	—	eShop	eShop	eShop	eShop	2	10	1.91	50	4	0.035	0.035	1
2×15	—	eShop	eShop	eShop	eShop	2	15	1.91	60	4	0.035	0.035	0.8
2×20	—	eShop	eShop	eShop	eShop	2	20	1.91	60	4	0.03	0.03	0.5
2×25	—	eShop	eShop	eShop	eShop	2	25	1.91	70	4	0.03	0.03	0.35
2×30	—	eShop	eShop	eShop	eShop	2	30	1.91	70	4	0.03	0.03	0.2
2×40	—	eShop	eShop	eShop	eShop	2	40	1.91	80	4	0.025	0.025	0.08
2×50	—	eShop	eShop	eShop	eShop	2	50	1.91	90	4	0.025	0.025	0.08
2,5×5	—	eShop	eShop	eShop	eShop	2.5	5	2.41	50	4	0.035	0.035	1
2,5×10	—	eShop	eShop	eShop	eShop	2.5	10	2.41	50	4	0.035	0.035	1
2,5×15	—	eShop	eShop	eShop	eShop	2.5	15	2.41	60	4	0.035	0.035	0.9
2,5×20	—	eShop	eShop	eShop	eShop	2.5	20	2.41	60	4	0.035	0.035	0.8
2,5×25	—	eShop	eShop	eShop	eShop	2.5	25	2.41	70	4	0.03	0.03	0.5
2,5×30	—	eShop	eShop	eShop	eShop	2.5	30	2.41	70	4	0.03	0.03	0.35
2,5×40	—	eShop	eShop	eShop	eShop	2.5	40	2.41	80	4	0.025	0.025	0.12
2,5×50	—	eShop	eShop	eShop	eShop	2.5	50	2.41	90	4	0.02	0.02	0.04
3×15	—	—	eShop	eShop	eShop	4.5	15	2.91	60	4	0.035	0.035	1
3×20	—	—	eShop	eShop	eShop	4.5	20	2.91	60	4	0.035	0.035	0.9
3×25	—	—	eShop	eShop	eShop	4.5	25	2.91	70	4	0.035	0.035	0.8
3×30	—	—	eShop	eShop	eShop	4.5	30	2.91	70	4	0.03	0.03	0.5
3×40	—	—	eShop	eShop	eShop	4.5	40	2.91	80	4	0.03	0.03	0.35
3×50	—	—	eShop	eShop	eShop	4.5	50	2.91	90	4	0.03	0.03	0.35
3×60	—	—	eShop	eShop	eShop	4.5	60	2.91	100	4	0.025	0.025	0.04



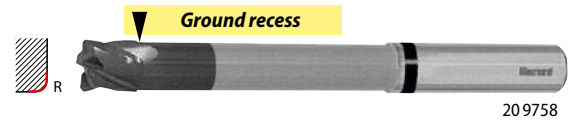
Garant Solid carbide torus cutter for GRP, CRP, and graphite

With the latest generation of **crystalline diamond coating sp³**, for process reliability in machining **fibre-reinforced composites, CRP, GRP and graphite**. Double relief ground side clearance angle.

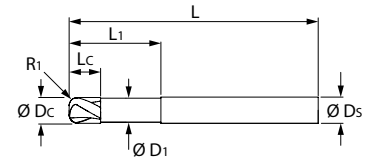
Tolerance: Corner radius $R_1 = \pm 0.01$ mm.



209755



209758



Suitable for/ v _c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 9755/9758							200	190	170	150	180	160	●	350		190	190	340			●	●	●

$\emptyset e8 D_c / R_1$	TOY 20 9755	TOY 20 9758	L_c	R_1	L_1	$\emptyset D_1$	L	$\emptyset D_s$	f_z	f_z
	Solid carbide torus cutter								Graphite	Graphite
mm	Diamond	Diamond	mm	mm	209755 mm	209758 mm	209755 mm	209758 mm	mm	mm
3/0,3	eShop	eShop	4	0.3	14	32	2.7	50	75	3
3/0,5	eShop	eShop	4	0.5	14	32	2.7	50	75	3
3/1,0	eShop	eShop	4	1	14	32	2.7	50	75	3
4/0,4	eShop	eShop	5	0.4	16	36	3.7	50	75	4
4/0,5	eShop	eShop	5	0.5	16	36	3.7	50	75	4
4/1,0	eShop	eShop	5	1	16	36	3.7	50	75	4
5/0,5	eShop	eShop	6	0.5	18	40	4.6	54	75	5
5/1,0	eShop	eShop	6	1	18	40	4.6	54	75	5
6/0,5	eShop	eShop	7	0.5	21	44	5.5	57	80	6
6/1,0	eShop	eShop	7	1	21	44	5.5	57	80	6
6/1,5	eShop	eShop	7	1.5	21	44	5.5	57	80	6
8/0,5	eShop	eShop	9	0.5	27	54	7.4	63	100	8
8/1,0	eShop	eShop	9	1	27	54	7.4	63	100	8
8/1,5	eShop	eShop	9	1.5	27	54	7.4	63	100	8
8/2,0	eShop	eShop	9	2	27	54	7.4	63	100	8
10/0,5	eShop	eShop	11	0.5	32	60	9.2	72	100	10
10/1,0	eShop	eShop	11	1	32	60	9.2	72	100	10
10/1,5	eShop	eShop	11	1.5	32	60	9.2	72	100	10
10/2,0	eShop	eShop	11	2	32	60	9.2	72	100	10
12/0,5	eShop	eShop	12	0.5	38	75	11	83	120	12
12/1,0	eShop	eShop	12	1	38	75	11	83	120	12
12/1,5	eShop	eShop	12	1.5	38	75	11	83	120	12
12/2,0	eShop	eShop	12	2	38	75	11	83	120	12

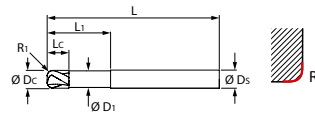


Garant Solid carbide torus cutter for GRP, CRP, and graphite

With the latest generation of **crystalline diamond coating sp³**, for process reliability in machining **fibre-reinforced composites, CRP, GRP and graphite**.

Double relief ground side clearance angle.

Tolerance: **Corner radius R₁ = ±0.01 mm.**



Ground recess



20 9760

Suitable for/ v _c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite						
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N						
20 9760							200	190	170	150	180	160	●	350			190	190	340			●	●	●

Ø e8 D _c / R ₁	10Y 20 9760	L _c	R ₁	L ₁	Ø D ₁	L	Ø D _s	 Graphite	 Graphite
mm	Solid carbide torus cutter	mm	mm	mm	mm	mm	mm	f _z mm	f _z mm
4/0,4	eShop	5	0.4	60	3.7	100	4	0.02	0.02
6/0,5	eShop	7	0.5	70	5.5	120	6	0.052	0.052
8/0,5	eShop	9	0.5	75	7.4	120	8	0.078	0.078
10/0,5	eShop	11	0.5	80	9.2	120	10	0.091	0.091
10/1,0	eShop	11	1	80	9.2	120	10	0.091	0.091
12/0,5	eShop	12	0.5	100	11	160	12	0.105	0.105
12/2,0	eShop	12	2	100	11	160	12	0.105	0.105

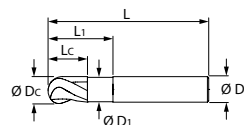


Garant Solid carbide ball nose milling cutter for GRP, CRP, and graphite

With the latest generation of **crystalline diamond coating sp³**, for process reliability in machining **fibre-reinforced composites, CRP, GRP and graphite**.

Double relief ground side clearance angle.

Tolerance: Radius contour = ±0.01 mm.



Ground recess



20 9776

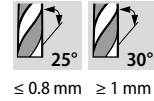
Ground recess



20 9781

Suitable for/ v _c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite							
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N							
20 9776/9781							200	190	170	150	180	160	●	350			190	190	340				●	●	●

Ø f8 D _c / D _s	10Y	20 9776	10Y	20 9781	L _c	L ₁		Ø D ₁	L		Ø D _s			Correction factor for v _c
	Solid carbide ball nose slot drill					20 9776	20 9781		20 9776	20 9781		f _z	f _z	
	mm	Diamond	Diamond	mm		mm	mm		mm	mm		mm	mm	
1		eShop		—	2	3	—	0.95	50	—	3	0.011	0.011	—
1/6		eShop		eShop	2	3	16	0.95	54	80	6	0.011	0.011	1.25
1,2		eShop		—	3	4	—	1.05	50	—	3	0.011	0.011	—
1,4		eShop		—	3	4	—	1.15	50	—	3	0.011	0.011	—
1,5		eShop		—	3	5	—	1.35	50	—	3	0.011	0.011	—
1,5/6		eShop		eShop	3	5	22	1.44	54	80	6	0.011	0.011	—
1,6		eShop		—	4	6	—	1.54	50	—	3	0.011	0.011	—
1,8		eShop		—	4	7	—	1.74	50	—	3	0.022	0.022	—
2		eShop		—	4	8	—	1.92	50	—	3	0.022	0.022	—
2/6		eShop		eShop	4	8	28	1.92	54	80	6	0.022	0.022	1.25
2,5		eShop		—	5	9	—	2.4	50	—	3	0.022	0.022	—
2,5/6		eShop		—	5	9	—	2.4	54	—	6	0.022	0.022	—
3		eShop		eShop	5	9	33	2.9	50	75	3	0.023	0.023	—
3/6		eShop		eShop	5	9	33	2.9	54	80	6	0.023	0.023	1.25
4		eShop		eShop	8	12	36	3.9	54	75	4	0.023	0.023	—
4/6		eShop		eShop	8	12	36	3.9	54	80	6	0.023	0.023	1.25
5		eShop		eShop	9	16	40	4.9	54	75	5	0.05	0.05	—
5/6		eShop		—	9	16	—	4.9	54	—	6	0.05	0.05	1.25
6		eShop		eShop	10	17	46	5.9	54	100	6	0.05	0.05	—
8		eShop		eShop	12	20.5	54	7.8	58	100	8	0.075	0.075	—
10		eShop		eShop	14	26	60	9.8	66	100	10	0.09	0.09	—
12		eShop		eShop	16	28	60	11.8	73	100	12	0.105	0.105	—
16		eShop		eShop	22	32	92	15.7	82	150	16	0.115	0.115	—
20		eShop		eShop	26	36	92	19.7	92	150	20	0.13	0.13	—



Garant Solid carbide micro precision copy slot drill for CRP, GRP and graphite

With **crystalline diamond sp³ coating**.

For the **highest demands regarding performance and precision** in fibre-reinforced composites, CRP, GRP, and graphite. **Extremely tight tolerances** ensure maximum accuracy. Double relief ground with 2 hollow-ground chamfers. **Recess angle $\alpha = 16^\circ$** .

Tolerances:

■ Corner radius: **Radius contour 0 / -0.005 mm.**

■ Neck $\varnothing$: **$D_1 = 0 / -0.01$ mm.**

Note:

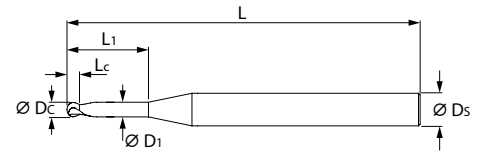
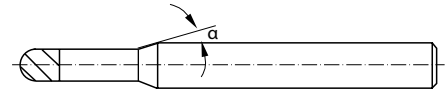
At greater tool overhang lengths, use a reduced value for a_p !

values for:

copying: $a_p = 0.15 \times D \times a_{p \text{ corr}}$

To calculate the feed rate v_f please use the actual speed of the machine (the maximum possible speed)!

e.g: $v_f = 18000 \text{ [rpm]} \times f_z \text{ [mm/Z]} \times z$



Suitable for/ v_c [m/min]	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Honey- comb sandwich	MMC	GRP	GRP CRP	Graphite					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
20 9791							200	190	170	150	180	160	●	350		190	190	340					

$\varnothing D_c \times L_1$	10° 20 9791	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	Graphite f_z	Correction factor $a_{p \text{ corr}}$
mm	Diamond	mm	mm	mm	mm	mm	mm	
0,2×0,5	eShop	0.16	0.5	0.17	45	4	0.012	1
0,2×1	eShop	0.16	1	0.17	45	4	0.012	1
0,2×2	eShop	0.16	2	0.17	45	4	0.007	0.5
0,2×3	eShop	0.16	3	0.17	45	4	0.007	0.2
0,3×1	eShop	0.24	1	0.27	45	4	0.016	1
0,3×2	eShop	0.24	2	0.27	45	4	0.016	0.9
0,3×4	eShop	0.24	4	0.27	45	4	0.012	0.35
0,3×6	eShop	0.24	6	0.27	45	4	0.007	0.08
0,4×2	eShop	0.32	2	0.37	45	4	0.016	1
0,4×4	eShop	0.32	4	0.37	45	4	0.012	0.5
0,4×6	eShop	0.32	6	0.37	45	4	0.012	0.2
0,4×8	eShop	0.32	8	0.37	45	4	0.007	0.08
0,5×2	eShop	0.4	2	0.47	45	4	0.02	1
0,5×4	eShop	0.4	4	0.47	45	4	0.02	0.8
0,5×6	eShop	0.4	6	0.47	45	4	0.016	0.35
0,5×8	eShop	0.4	8	0.47	45	4	0.016	0.12
0,5×10	eShop	0.4	10	0.47	50	4	0.012	0.08
0,5×12	eShop	0.4	12	0.47	50	4	0.012	0.04
0,6×2	eShop	0.48	2	0.57	45	4	0.02	1
0,6×4	eShop	0.48	4	0.57	45	4	0.02	0.9
0,6×6	eShop	0.48	6	0.57	45	4	0.016	0.5
0,6×8	eShop	0.48	8	0.57	45	4	0.016	0.35
0,6×10	eShop	0.48	10	0.57	50	4	0.016	0.12
0,6×15	eShop	0.48	15	0.57	60	4	0.012	0.08
0,8×4	eShop	0.64	4	0.77	45	4	0.02	1
0,8×6	eShop	0.64	6	0.77	45	4	0.02	0.8
0,8×8	eShop	0.64	8	0.77	45	4	0.016	0.5
0,8×10	eShop	0.64	10	0.77	50	4	0.016	0.35

$\varnothing D_c \times L_1$	10Y 20 9791	L_c	L_1	$\varnothing D_1$	L	$\varnothing D_s$	 f_z	Correction factor $a_{p, corr}$
mm	Diamond	mm	mm	mm	mm	mm	mm	
0,8×15	eShop	0.64	15	0.77	60	4	0.016	0.2
0,8×20	eShop	0.64	20	0.77	60	4	0.012	0.08
1×4	eShop	0.8	4	0.96	45	4	0.03	1
1×6	eShop	0.8	6	0.96	45	4	0.03	0.9
1×8	eShop	0.8	8	0.96	45	4	0.03	0.8
1×10	eShop	0.8	10	0.96	50	4	0.025	0.5
1×12	eShop	0.8	12	0.96	50	4	0.025	0.35
1×15	eShop	0.8	15	0.96	60	4	0.025	0.2
1×16	eShop	0.8	16	0.96	60	4	0.025	0.15
1×20	eShop	0.8	20	0.96	60	4	0.02	0.08
1×25	eShop	0.8	25	0.96	70	4	0.02	0.04
1×30	eShop	0.8	30	0.96	70	4	0.016	0.02
1,2×5	eShop	0.96	5	1.16	45	4	0.03	1
1,2×10	eShop	0.96	10	1.16	45	4	0.03	0.8
1,2×15	eShop	0.96	15	1.16	50	4	0.025	0.35
1,2×20	eShop	0.96	20	1.16	60	4	0.025	0.12
1,2×25	eShop	0.96	25	1.16	60	4	0.02	0.08
1,2×30	eShop	0.96	30	1.16	70	4	0.016	0.04
1,5×10	eShop	1.2	10	1.44	45	4	0.03	0.9
1,5×15	eShop	1.2	15	1.44	50	4	0.025	0.5
1,5×20	eShop	1.2	20	1.44	60	4	0.025	0.35
1,5×25	eShop	1.2	25	1.44	70	4	0.025	0.12
1,5×30	eShop	1.2	30	1.44	70	4	0.02	0.08
1,6×5	eShop	1.28	5	1.54	45	4	0.03	1
1,6×10	eShop	1.28	10	1.54	45	4	0.03	0.9
1,6×15	eShop	1.28	15	1.54	50	4	0.025	0.5
1,6×20	eShop	1.28	20	1.54	60	4	0.025	0.35
2×5	eShop	1.6	5	1.94	45	4	0.035	1
2×10	eShop	1.6	10	1.94	45	4	0.035	1
2×15	eShop	1.6	15	1.94	50	4	0.035	0.8
2×16	eShop	1.6	16	1.94	50	4	0.035	0.7
2×20	eShop	1.6	20	1.94	60	4	0.03	0.5
2×25	eShop	1.6	25	1.94	70	4	0.03	0.35
2×30	eShop	1.6	30	1.94	70	4	0.03	0.2
2×40	eShop	1.6	40	1.94	80	4	0.025	0.04
2×50	eShop	1.6	50	1.94	90	4	0.025	0.02
2,5×5	eShop	2	5	2.41	45	4	0.035	1
2,5×10	eShop	2	10	2.41	45	4	0.035	1
2,5×15	eShop	2	15	2.41	50	4	0.035	0.9
2,5×20	eShop	2	20	2.41	60	4	0.035	0.8
2,5×25	eShop	2	25	2.41	70	4	0.03	0.5
2,5×30	eShop	2	30	2.41	70	4	0.03	0.35
2,5×40	eShop	2	40	2.41	80	4	0.025	0.12
2,5×50	eShop	2	50	2.41	90	4	0.02	0.08
3×15	eShop	3.5	15	2.92	60	4	0.035	1
3×20	eShop	3.5	20	2.92	60	4	0.035	0.9
3×25	eShop	3.5	25	2.92	60	4	0.035	0.8
3×30	eShop	3.5	30	2.92	70	4	0.03	0.5
3×40	eShop	3.5	40	2.92	80	4	0.03	0.35
3×50	eShop	3.5	50	2.92	90	4	0.03	0.12
3×60	eShop	3.5	60	2.92	100	4	0.025	0.08

Overview – milling cutters range Group 21 / 22

i



Type	Copy mill							
Designation >								5720VZ16
Brand	Garant	Garant	Garant	Garant	Garant	Garant	Garant	KENAMETAL
Art. no.	211806–211852	212534–212542	212003	212006/212015	212009/212018	212070–212170	212590–212620	220800–220806
Diameter (mm)	16–80	16–66	20–25	20–42	35–125	10–125	8–32	25–80
$a_{p\max}$ (mm)	5–15	2,5–3	5–6	5–6	5–6	1,1–5	0,3–5,5	16
Approach angle	90°/93°							90°
Number of cutting edges	2–5	3–8	2–3	2–5	3–10	2–10	2	2–5
Interface	Weldon shank / thread / bore	Thread / bore	Weldon shank	Thread	Bore	Plain shank / Weldon shank / thread / bore	Plain shank / thread	Plain shank / thread / bore
Coolant channels IC	IC	IC	IC	IC	IC	IC	IC	IC
Suitable insert								
Insert type / ISO	VDGT / VCG.	CPHX06 / 09	RPK.10T3	RPK.10T3/RPK.1204	RPK.10T3/RPK.1204	RD..		ZDET 16
Art. no.	211853–211864	212552–212578	212032–212042	212032–212062	212032–212062	212178–212310	212630–212756	220810–220832
Further application								
ISO-Code	N	PHM_K	PHMSK	PHMSK	PHMSK	NPHMSK	NPHMSK	N
Side	590–592	600–601	593–594	593–594	593–594	595–599	602–603	681



Type	High feed rate milling cutter							
Designation >	Power Q Mini	Power Q	Power Q	Power Q	Power Q Double	Power Q Double	FeedKing	HiS
Brand	Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant
Art. no.	213052–213058	212802–212804	212807–212812	212813–212817	213000–213006	213014	212900–212910	213110–213210
Diameter (mm)	40–66	16–22	25–52	30–100	25–66	50–100	18–100	25–125
$a_{p\max}$ (mm)	1	0,5–1,1	0,7–1,3	0,8–1,5	0,6–1,2	0,8–1,5	0,85–1,8	1,4–2,2
Approach angle								
Number of cutting edges	2–8	2–3	2–5	2–7	2–7	4–8	2–9	2–10
Interface	Plain shank / Weldon shank / thread / bore	Plain shank / Weldon shank / thread /	Plain shank / Weldon shank / thread / bore		Plain shank / Weldon shank / thread / bore	Bore	Plain shank / Weldon shank / thread / bore	Weldon shank / thread / bore
Coolant channels IC	IC	IC	IC	IC	IC	IC	IC	IC
Suitable insert								
Insert type / ISO	ANGX10T3	XOM.0603	XDM.0904	XDM.1205	XOMU094812	XOMU146714	XDL / XDP.	POMX
Art. no.	213064–213075	212819–212854	212860–212885	212887–212899	213024–213036	213038–213050	212921–212991	213122–213193
Further application								
ISO-Code	PHMSK	PHMSK	PHMSK	PHMSK	PHMSK	PHMSK	NPHMSK	PHMSK
Side	604–605	606–608	606–608	607–608	609–611	610–611	612–615	616–617

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Overview – milling cutters range Group 21 / 22



Type	High feed rate milling cutter								Face mill	
Designation >	Softcut® HSI12	LOGIQ4Feed	LOGIQ4Feed	LOGIQ4Feed	MFH micro	MFH mini	MFH	7792VX	43° Octo	
Brand	Garant	ISCAR	ISCAR	ISCAR	KYOCERA	KYOCERA	KYOCERA	KEHNAMETAL	Garant	
Art. no.	214848	221100–221101	221104	221106	221941–221943	221950–221965	222050–222065	221900–221908	213300	
Diameter (mm)	40 – 63	16 – 32	20 – 42	32 – 52	8 – 16	16 – 52	25 – 160	16 – 160	32 – 125	
a _{p max} (mm)		0.8	0.8	0.8	0.5	1	1.5 – 5	0.9 – 3.5	2.2 – 3.5	
Approach angle									43°	
Number of cutting edges	3 – 5	2 – 5	3 – 6	5 – 7	1 – 4	2 – 8	2 – 8	2 – 12	3 – 8	
Interface	Bore	Parallel shank / Weldon shank	Thread	Bore	Plain shank / Weldon shank / thread	Plain shank / Weldon shank / thread / bore	Plain shank / Weldon shank / thread / bore	Plain shank / Weldon shank / thread / bore	Bore	
Coolant channels IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	
Suitable insert										
Insert type / ISO	S0.T1205	XN MU0403	XN MU0403	XN MU0403	LP GT 0102	LOGU 0303	SOMT	X.L.	OF.0504	
Art. no.	214860–214890	221201–221214	221201–221214	221201–221214	221945–221949	221971–221976	222071–222092	221920–221939	213320–213362	
Further application										
ISO – code	NP_M_K	P_MSK	P_MSK	P_MSK	P_MSK	P_MSK	P_MSK	NP_MSK	NPHMSK	
Side	627 – 628	682 – 683	682 – 683	682 – 683	686	687	688 – 689	684 – 685	618	



Type	Shoulder mill									
Designation >		Aluking	Softcut® HSI12	Softcut® HSI08	NEODO					
Brand	Garant	Garant	Garant	Garant	ISCAR	Garant HOLEX	Garant	HOLEX		
Art. no.	211755 – 211759	214515	214853 – 214857	214902 – 214908	225750 – 225760	215045 – 215055	215101	215102		
Diameter (mm)	25 – 80	40 – 125	32 – 160	20 – 100	25 – 125	25 – 100	40 – 100	40 – 100		
a _{p max} (mm)	13.5	5 – 10	10	6	5	5	4	4		
Approach angle	90°	90°	90°	90°	90°	90°	90°	90°		
Number of cutting edges	2 – 5	2 – 8	2 – 14	2 – 10	3 – 18	2 – 8	4 – 8	4 – 8		
Interface	Plain shank / thread / bore	Bore	Thread / bore	Weldon shank / thread / bore	Plain shank / Weldon shank / bore	Weldon shank / bore	Bore	Bore		
Coolant channels IC	IC	IC	IC	IC	IC	IC	IC	IC		
Suitable insert										
Insert type / ISO	ZDHT1505	BGHX 15L5	S0.T 1205	S0.T 0836	SZMU 0804	SOMT 09T3	XNEX 0806	XNEX 0806		
Art. no.	211762 – 211777	214525 – 214565	214860 – 214890	214914 – 214956	225800 – 225813	215065 – 215080	215104 – 215192	215104 – 215192		
Further application										
ISO – code	N	NP_M_K	NP_M_K	NP_M_K	P_MSK	NP_MSK	NP_M	NP_M		
Side	588 – 589	626	627 – 628	629 – 630	696	631	632	632		

Overview – milling cutters range Group 21 / 22



Face mill									
TwinCut	Softcut®45					DOVEIQMILL	MFPN45	MSRS	MFK
Garant	Garant	Garant	Garant	MOLEX	Garant	ISCAR	KYOCERA	KYOCERA	KYOCERA
213410–213420	213555	213890	214200/214202/214205	214395–214400	222500	222800	224000	223300	
40 – 250	32 – 250	50 – 250	32 – 250	16 – 125	50 – 160	63 – 250	80 – 315	80 – 315	
3 – 6	4	3.5	1.5 – 3.5	3	4.6	6	12	6	
45°	45°	45°	45°	45°	50°	47.5°	75°	70°	
3 – 18	3 – 16	4 – 13	3 – 16	2 – 14	4 – 11	4 – 20	4 – 16	8 – 44	
Bore	Bore	Bore	Bore	Weldon shank / bore	Bore	Bore	Bore	Bore	
IC	IC	IC	(IC)	IC	IC				
ON.U05 / SN.U14	SE.T1305	SE..1203	SE..1204	SD..0903	SYHU 0704	PN.U 1205	SMPT 1806	PN..1106	
213424–213470	213564–213596	213905–213961	214240 – 214353	214438–214479	222510–222522	222805 – 222826	224012 – 224031	223306 – 223332	
NP_M_K	NP_M_K	NPHMSK	NPHMSK	NP_MSK	NP_MSK	P_MSK	P_MSK	P_MSK	
619 – 620	621	622	623 – 624	625	690	691	693	692	

Shoulder mill								
			Power Tang	Power Tang	Softcut®18	Softcut®90°	Softcut®06	
Garant	Garant	Garant	Garant	Garant	Garant	Garant	Garant	
215176/215177	215178	215182	215122	215950 – 215968	215155 – 215160	215405 – 215411	215605 – 215620	
20 – 32	20 – 32	32 – 63	40 – 125	20 – 63	25 – 160	14 – 80	10 – 63	
2	2	2	12	8	9	3 – 5.5	2.5 – 4	
90°	90°	90°	90°	90°	90°	90°	90°	
3 – 5	3 – 5	6 – 9	4 – 15	2 – 9	2 – 10	1 – 10	2 – 12	
Weldon shank / plain shank	Thread	Bore	Bore	Plain shank / Weldon shank / thread / bore	Plain shank / Weldon shank / bore	Plain shank / Weldon shank / thread / bore	Plain shank / Weldon shank / thread / bore	
IC	IC	IC	IC	IC	(IC)	IC	IC	
XNEX 0403	XNEX 0403	XNEX 0403	LO.U 130708	LO.U 090408	A.P.T. 1805	A.O.T. 1104	A.P.T. 0602	
215195 – 215199	215195 – 215199	215195 – 215199	215131 – 215151	215980 – 215996	215202 – 215276	215422 – 215487	215621 – 215692	
P_M	P_M	P_M	P_MSK	P_MSK	NP_MSK	NP_MSK	NP_MSK	
633	633	633	634	635 – 636	637 – 639	641 – 643	644 – 646	

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Overview – milling cutters range Group 21 / 22



Type	Shoulder mill								
Designation >			MEW	MFWN	MEV	HELI3MILL	HELI3MILL	MECX	MEC11T/MEC17
Brand									
Art. no.	215705 – 215717	215800 – 215870	225200 – 225210	225600 – 225615	226400 – 226420	226480 – 226486	226488 – 226490	227100 – 227115	227300 – 227515
Diameter (mm)	25 – 160	10 – 100	16 – 80	50 – 250	20 – 50	25 – 80	40 – 125	8 – 63	16 – 160
a _{p max} (mm)	7	4.8	10 – 15	8	6	8	13	6	10 – 15.7
Approach angle	90°	90°	90°	90°	90°	90°	90°	90°	90°
Number of cutting edges	2 – 10	1 – 12	2 – 6	3 – 18	2 – 5	3 – 11	4 – 9	1 – 14	2 – 14
Interface	Plain shank / Weldon shank / bore	Weldon shank / thread / bore	Plain shank / bore	Plain shank / bore	Parallel shank / Thread / bore	Plain shank / Weldon shank / thread / bore	Plain shank / bore	Plain shank / Weldon shank / bore	Plain shank / Weldon shank / thread / bore
Coolant channels IC	(IC)	(IC)	IC	IC	IC	IC	IC	IC	IC
Suitable insert									
Insert type / ISO	AP. 16	AP. 10	LO.10 / LO. 15	WNMU 0806	TOMT 0605	TP.T 1003	TD.T 1505	BDMT 0703	BD.T 11/BD.T17
Art. no.	215720 – 215781	215879 – 215947	225220 – 225240	225620 – 225630	226430 – 226445	226499 – 226517	226560 – 226589	227135 – 227160	227325 – 227568
Further application									
ISO – code	N P H M S K	N P M S K	P M S K	P M S K	P M S	N P M S K	P M S K	P M K	N P M S K
Side	647 – 648	649 – 650	694	695	697	698/700	699 – 700	701	702 – 704



Type	Chamfer mill	Radius Milling Tool	Engraver / deburrer	Circular mill	Side milling and T-slot milling cutter					
Designation >								HELISLOT	HELISLOT	
Brand										
Art. no.	216100 – 216635	216825	217202 – 217225	217250 – 217405	218300	218408 – 218444	218540 – 218569	218205 – 218210	227700 – 227716	227718 – 227722
Diameter (mm)	2 – 33.5	22	6 – 10	7.9 – 23	21 – 50	50 – 160	50 – 160	32 – 80	40 – 200	31.7 – 160
a _{p max} (mm)						1.5 – 3.1	4 – 16	1 – 5	14 – 20	9.9 – 12
Approach angle	30° – 60°									
Number of cutting edges	1 – 6	2	1 – 6	3 – 6	1 – 2	4 – 15	2 – 8	16 – 40	1 – 12	2 – 18
Interface	Weldon shank / plain shank / thread	Weldon shank	Plain shank	Plain shank / Weldon shank / thread	Weldon shank	Plain shank / thread / bore	Thread/ bore	Weldon shank / bore	Weldon shank / bore / flange	Weldon shank / flange
Coolant channels IC	(IC)			IC	IC			IC		
Suitable insert										
Insert type / ISO	TO../TC../SD../SC..	Special	Special		SPMT	Special	SNHX		XNMT1306	XNMT0904
Art. no.	216408 – 216770	216841	217210 – 217229	217255 – 217510	218305 – 218360	218450 – 218484	218571 – 218625	218220 – 218236	227739 – 227747	227782 – 227784
Further application										
ISO – code	N P M S K	P M K	N P M K	N P H M S K	N P M K	N P M K	N P M K	N P M K	P M S K	P M
Side	651 – 655	656	657	658 – 664	666	667 – 668	669 – 671	665	707/709	708 – 709

Overview – milling cutters range Group 21 / 22



Porcupine mill						Chamfer mill				
Power Tang	Softcut®18	Softcut®90°	Softcut®06		MEC11/MEC17	Softcut®HSI12	Softcut®HSI08	Softcut®18	Softcut®90°	
Garant	Garant	Garant	Garant	Garant	KYOCERA	Garant	Garant	Garant	Garant	Garant
215972 / 5974 – 215126	215161	215413 – 215415	215622	215840 – 215860	227450 – 227655	214851	214911	215152	215403	215700/ 215795
25 – 100	50 – 80	20 – 50	16 – 25	20 – 32	25 – 100	59.3	16 – 25	35 – 92	17 – 69	17 – 94
32 – 81	28 – 55	20 – 39.5	22.5 – 33.5	17 – 38	30 – 74					
90°	90°	90°	90°	90°	90°	45°	45°	15° – 75°	15° – 75°	15° – 75°
2 – 6	3 – 6	2 – 5	2 – 5	2 – 3	2 – 6	3	3 – 5	3	3	3
Weldon shank / thread / bore	Bore	Weldon shank / bore	Weldon shank	Weldon shank	Plain shank / Weldon shank / bore	Bore	Weldon shank	Bore	Bore	Bore
IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC
LO.U 0904 / LO.U 1307	APT. 1805	AO.T 1104	APT. 0602	AP. 1003	BD.T11/BD.T17	SO.T 1205	SO.T 0836	APT. 1805	AO.T 1104	AP. 10/AP. 16
215980 – 5996 / 215131 – 5151	215202 – 215276	215422 – 215487	215623 – 215692	215880 – 215948	227472 – 227683	214860 – 214890	214914 – 214956	215202 – 215276	215422 – 215487	215720 – 215947
P_MSK	NP_MSK	NP_MSK	NP_M_K	NP_MSK	P_K	NP_M_K	NP_M_K	NP_MSK	NP_MSK	NPHMSK
634/636	638 – 639	642 – 643	645 – 646	649 – 650	705 – 706	627 – 628	630	637/639	641/643	647 – 650

Solid carbide mill for general-purpose machining



HAIMER DUO-LOCK® Interchangeable head system

can be found on pages 675 – 679.

The advantages at a glance!

Maximum concentricity and length repetition accuracy due to the modular interface with double taper on a wide variety of carbide tool heads. Unsurpassed productivity and stability due to a protected unique thread design and third support area. Process reliability without loss of performance due to the finest, virtually unbreakable carbide grade.

Conclusion

Quick and precise changing of the Duo-Lock® milling heads:

- Saves time.
- Saves material as the shank remains in place.
- Higher metal removal rate with very high process reliability.

Furthermore:

Also increase safety with HAIMER Safe-Lock®. The innovative shank shape can also be used on the Duo-Lock® extensions. This ensures consistent pull-out protection for reliable load capacity.



Superior rigidity of the interface which allows up to 1 x D cutting depth for slot milling and 3 x D cutting depth for side milling.

With the 3 precise mating faces of the interfaces, the Duo-Lock® has become established as the most accurate and most stable interchangeable head system. The double cone contact surfaces in combination with the third support surface in the rear area result in high rigidity and precision.



220334



220327



220376



220353

Milling cutter type	End mill		Torus cutter	
	DIN >	6527	6527	6527
Art. no.		220286 220289 220292	220288 220290 220294	220296 220298
Milling cutter type		N	N	N
Application recommendation				
Size range (Ø mm)		2 – 20	2 – 20	4 – 20
Cutting edge length (mm)		7 – 60	7 – 60	11 – 38
Number of cutting edges		4	4	4
Coolant channels IC		HPC	HPC	HPC
HSC / HPC / MTC / TPC / PPC		AITIN	AITIN	AITIN
Coating		HA	SAFE-LOCK®	HA
Type of shank		HA	SAFE-LOCK®	HA
Secondary application to DIN ISO 513		NPMK	NPMK	NPMK
Side		673	673	674

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Garant Milling / tool materials



	P (steel)					M (Inox)				K GG(G)				N (Alu)		S (Ti)		H (HRC)		
	P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	(Alu)	(Alu)	(Ti)	(Ti)	< 55	< 60	< 67
Grade description																				
Highly wear-resistant grade for machining unalloyed tool steels and high-tensile materials up to 56 HRC		HB4015				HB4015				HB4015										
Suitable for machining low-tensile steels. PVD coated.		HB4020																		
Outstandingly suitable for high-alloy tool steels. Ultra-fine grain grade with multi-layer coating.			HB4030																	
Extremely wear-resistant grade with AlTiCrN coating for hard machining.										HB4715								HB4715		
Tool material with AlTiCrN multi-layer PVD coating, developed for use on stainless steels.							HB4130													
High-performance tool material for machining Inconel and heat resistant superalloys (HRSA). Multi-layer PVD coating.																	HB4420			
Tool material for machining titanium. Multi-layer PVD coating.																	HB4430			
Wide-range grade. General-purpose tool material.		HB415				HB415														
Highly wear-resistant grade for hard machining up to 60 HRC. TiC / TiN-CVD multi-layer coating.		HB7505								HB7505								HB7505		
Wear-resistant grade for high-speed machining in steel.		HB7510	HB7510																	
Grades update for grade HB 7510.		HB7510-1																		
Machining of heat-treatable and tool steels, and also cast iron. Ti(C, N)+Al ₂ O ₃ .		HB7515								HB7515										
Micro-grain grade with TiC / TiN and nano-layer coating.		HB7520	HB7520			HB7520	HB7520													
Grades update for grade HB 7520.		HB7520-1				HB7520-1														
Grade for wet and dry machining and high cutting speeds. TiC / TiN-CVD multi-layer coating or Ti(C, N)+Al ₂ O ₃ coating. For NC spotting drills with TiCN coating.		HB7525	HB7525	HB7525		HB7525	HB7525	HB7525												
Wide-range grade for machining steel. Especially suitable for low tensile strength steels. Tough substrate means low susceptibility to fracture.			HB7530																	
Ideal for use in difficult conditions and on stainless steels. (P30/40) (M20/35) micro-grain grade with TiAlN/TiN—PVD multi-layer coating.			HB7535	HB7535		HB7535	HB7535										HB7535	HB7535		
Highly wear-resistant grade for machining hardened materials. PVD coated.		HB7605								HB7605								HB7605		
Special grade for stainless steels.						HB7625														
Micro-crystalline grade with balanced basic toughness and nano-layer coating.						HB7630														
Tough carbide with CVD multi-layer coating especially for stainless steels. For 45° chamfer mills, with PVD coating.						HB7635	HB7635													
Highly wear-resistant grade for hard machining up to 60 HRC. TiC / TiN-CVD multi-layer coating.										HB7705								HB7705		
Wear-resistant grade for machining cast iron. (P10) (K10/20) carbide with TiAlN-CVD coating.		HB7710								HB7710										
Wear-resistant grade for high alloy tool steels, cast iron, and nickel alloys.		HB7720								HB7720										
(P20/30) (K20/30) Grades for high cutting speeds. Ideal for dry machining. Specially suited for hard machining, mounted on TopCut indexable face mills.			HB7730							HB7730										
Grades update for grade HB 7730.			HB7730-1							HB7730-1										
Machining of low tensile strength materials. (P30/40) (M20) carbide with TiAlN-CVD coating.			HB7735	HB7735													HB7735			
Specially for machining aluminium at high cutting speeds.														HB7805						
Nano-crystalline high performance coating for aluminium, aluminium alloys and composite materials. Some are diamond-coated.														HB7810						
Grades update for grade HB 7810.														HB7810-1						
PVD multi-layer coating based on AlTiCrBN. For finishing, semi-roughing and roughing machining.		HB7830-1				HB7830-1														
PVD-coated carbide substrate for general-purpose machining.		HB7835				HB7835														
Wear-resistant grade for machining titanium and cast iron.										HB7930							HB7930			
Grades update for grade HB 7930.										HB7930-1							HB7930-1			
Micro-grain grade with high toughness. Suitable for machining stainless steels and materials that are difficult to machine.																	HB7935			
Exceptionally wear-resistant grade, PVD-coated.																	HB7940			
Micro-crystalline carbide with multi-layer coating for wet machining of stainless steels.						HB8630														
Wear-resistant PVD-coated tool material grade for machining steels.		HB9520																		

NEW

NEW

NEW

NEW

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Member IBC Group

Milling / tool materials



		P (steel)					M (Inox)				K GG(G)				N (Alu)		S (Ti)		H (HRC)			
		P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	(Alu)	(Alu)	(Ti)	(Ti)	< 55	< 60	< 67	
Carbide coated	Fine-grain substrate for machining steel with CVD-Al ₂ O ₃ coating. Suitable to a limited extent for machining stainless steels.	HB9525					HB9525															
	Carbide grade with fine grain size and PVD multi-layer coating for use on steels.			HB9540																		
	Tool material for general use, very tough. Substrate with thin CVD-Al ₂ O ₃ coating.			HB9640				HB9640				HB9640					HB9640					
	Tool grade with PVD multi-layer coating, developed for use on stainless steels. Suitable for unstable machining conditions.			HB9645				HB9645									HB9645					
	Extremely wear-resistant grade for machining cast iron.										HB9710											
	Tool material grade with PVD, TiAlN and TiAlSiN coatings, with high abrasion resistance and relatively low cobalt content for use under stable machining conditions.										HB9715								HB9715			
	Fine-grain solid carbide with nano-layer coating (PVD). Specially for machining stainless steels.							HB9740														
	PVD-coated fine-grain solid carbide with exceptional toughness. Specially for machining titanium.																	HB9745				
	Wide-range grade for steel, stainless materials, cast materials.		HB725				HB725				HB725											
	All-round grade for wet and dry machining in steel and stainless steel, also cast iron.			HB735				HB735				HB735						HB735				
Carbide uncoated	High-performance fine-grain substrate for ALU and plastics															HU7705						
	Especially for aluminium, non-ferrous metals and plastics, often in highly polished versions (K10/20).																HU7710					
	Extremely wear-resistant grade for aluminium.																HU7805					
	K10 fine grain. High wear resistance grade for aluminium, aluminium alloys and non-ferrous metals.																HU7810					
	Grades update for grade HU 7810.																HU7810-1					
	Uncoated polished tool material type for machining non-ferrous metals.																HU7815					
	Grade for machining non-ferrous metals including titanium.																HU7830		HU7830			
	Uncoated carbide grade for machining non-ferrous metals.																HU9815					
Cermet	Micro-grain solid carbide for machining aluminium.			CU7530																		
	Uncoated. Very tough and highly wear-resistant Cermet for dry machining at low cutting depths.	CU7725					CU7725															
CBN	Wear-resistant CBN grade. Coated.																		CBN925			
CERA-MIC	Uncoated Sialon ceramic for machining castings at high cutting speeds.										KU7710											
	Suitable for both non-ferrous metals and also non-metallic materials. For uninterrupted cutting, high cutting speeds and low feed rates. Particle size 5 µm.														PCD							
HAEMER																						
Carbide coated	Coated carbide grade for general-purpose use. High wear resistance for processing steel.	AlTiN					AlTiN				AlTiN				AlTiN		AlTiN					
Coated carbide	CVD-coated, for rough grinding at medium and high cutting speeds.	IC5400																				
	CVD-coated, for rough grinding and finishing in stable conditions.	IC5600																				
	PVD-coated, for finishing at medium to high cutting speeds.	IC808					IC808															
	PVD-coated, universal carbide grade, highly suitable for initial tests.			IC830					IC830													
	PVD-coated, for rough grinding at high feed rates, interrupted cutting.			IC845																		
	CVD-coated, thick coating for high cutting speeds in grey cast iron.										IC5100											
	PVD-coated, 1st choice for low and medium cutting speeds.										IC810											
	CVD-coated, extremely temperature-resistant, contains ruthenium.																IC5820					
	PVD-coated, rough grinding and finishing in unstable conditions.																IC380					
	PVD-coated, rough grinding and finishing on titanium alloys.																IC716					
	PVD-coated, rough grinding and finishing on HTSA materials.																IC882					
	un-coated	Rough grinding on aluminium alloys and non-ferrous metals at high feed rates.													IC28							

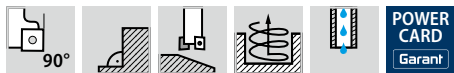
NEW

21

Grade description		P (steel)					M (Inox)				K GG(G)				N (Alu)		S (Ti)		H (HRC)			
		P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	(Alu)	(Alu)	(Ti)	(Ti)	< 55	< 60	< 67	
KENNAMETAL																						
Carbide coated	Wear-resistant grade for cast iron. TiN-TiCN-Al ₂ O ₃ -CVD multi-layered coating.										SC3025											
	Wear-resistant grade for steel at high cutting speeds and feed rates. TiN-TiCN-Al ₂ O ₃ .		SC6525																			
	Grade for machining steel at higher cutting speeds		KCMP30																			
	High wear resistance coupled with high toughness. Nano-structured TiAlN-PVD coating.		SP6519					SP6519				SP6519				SP6519						
	Machining with a heavily interrupted cut. For use in alloyed, tool and high-temperature steels. TiAlN-PVD coating.		X400																	X400		
	High performance grade with exceptionally high toughness. For machining alloy steels, stainless steels, and high-temperature steels. TiN-TiC-TiCN-CVD multi-layer coating.		X500					X500				X500				X500						
Carbide uncoated	Uncoated micro-grain grade with high wear resistance for aluminium and non-ferrous metals. Also for roughing and finish machining of cast iron and heat-resistant alloys.										GH1					GH1		GH1				
	Uncoated micro-grain grade for applications in aluminium and cast iron.										GH2					GH2						
KYOCERA																						
Carbide coated	Megacoat-NanoEX. 1st choice for cast materials.										PR1810						PR1810					
	Megacoat coating (PVD) on a fine-grain substrate. For general-purpose applications in steel and stainless steels.		PR1225					PR1225														
	Megacoat-NanoEX. 1st choice for steel.		PR1825					PR1825														
	Megacoat multilayer coating (PVD) and substrate for machining cast iron.										PR1510						PR1510					
	Megacoat multi-layer coating (PVD) on a fine-grain substrate. First choice for general-purpose applications in steel and stainless steels.		PR1525					PR1525														
	Megacoat multilayer coating (PVD) on a fine-grain substrate. For stainless steels and titanium alloys.								PR1535								PR1535					
	Megacoat-NanoEX. 1st choice for stainless materials.								PR1835								PR1835					
	α-Al ₂ O ₃ coating CCRD, as first choice for Ni-based heat resistant alloys and martensitic stainless steels.								CA6535								CA6535					
Carbide uncoated	CVD-coated substrate of very high toughness for high protection against wear when machining cast iron.										CA420M											
	Uncoated wear-resistant micro-grain grade for machining aluminium. High hardness and toughness.														GW25							
Cermet	Tough Cermet with high resistance to oxidation and thermal shock. For productive applications in steel.		TN100M					TN100M														
Ceramic	Ceramic grade for high cutting speeds.										CS7050											
	Ceramic grade for the highest cutting speeds.										KS6050											
mimatic																						
Carbide	Wear-resistant micro-grain carbide with Tinamic coating.		TiAlN					TiAlN				TiAlN					TiAlN					
HOLEX																						
Carbide coated	Optimised wide-range grade for machining steel. CVD coating.		HBM015																			
	Special carbide grade for machining stainless steels. Ideal for use under difficult machine conditions.								HBM130													
	Coated carbide grade for general-purpose use.		HBM020					HBM020				HBM020										
	General-purpose CVD-coated multi-range grade.		HBM20					HBM20														
	PVD-coated multi-range grade for a wide range of applications.		HBM025					HBM025									HBM025					
Carbide uncoated	Uncoated highly wear-resistant tool material type for machining non-ferrous metals.															HUM310						

NEW

Shape	Clearance angle	ISO	Insert size	Garant	Isaief	KENNAMETAL	KYOCERA	KOMET	HOLEX
Side									
A... Rhomboid 85°	AN...	ANGT	10 / 16	672					
		ANGX	10	605					
A... Rhomboid 85°	AO... special	AO.T	11	643					
	AP...	APET	18	639					
		APEX	16	648					
		APFT	16	648					
		APHT	06 / 10 / 16	646–650		648			
		APKT	10 / 16	648		648	648/650		
		APKX	16	648					
		APMT	06 / 10 / 18	646–650					
		APMX	16	648					
		APXT	16	648					
B... Rhomboid 82°	BD...	BDGT	11 / 17			704			
		BDMT	07 / 11 / 17			701 / 704–706			
	BG...	BGHX	15	626					
C... Rhombus 80°	CP...	CPHX	06	601					
		CPHX	09	601					
L... Orthogon 90°	LO... special	LOEU	09 / 13	634 / 636					
		LOMU	09 / 10 / 13 / 15	634 / 636		694			
		LOGU	03			687			
	LP...	LPGT	01			686			
M... Rhombus 86°	MP...	MPHX	06 / 11	672					
O... Octagon 135°	ON...	ONEU	05	620					
		ONMU	05	620					
	OF...	OFEW	05	618					
		OFMT	05	618					
P... Pentagon 108°	PN...	PN.U	12			691			
		PN..	11			692			
	PO... special	POMX	07 / 10	616 / 617					
R... Round	RD...	RDHT	05 – 16						
		RDHW	05 – 16						
		RDHX	05 – 16						
		RDMT	10 / 12						
		RDMW	12 / 16						
		RDNX	07 / 10 / 12 / 16						
		RPK.	10	594					
		RPK.	12	594					
S... Square 90°	SN...	SNEU	14	620					
		SNHX	11 / 12	671					
		SNMU	14	620					
	SC...	SCLT	05	652					
	SP...	SPGT	06 / 09 / 12	666					
		SPKN	12	672					
		SPLR	12	672					
		SPMT	06 / 09 / 12 / 18	666		693			
		SPUN	12	672					
	SD...	SDGT	09	651					
		SDHT	09	625					
		SDHW	09	625					
		SDHX	09	625					
		SDLT	09	651					
		SDMX	09	625					
Shape	Clearance angle	ISO	Insert size	Garant	Isaief	KENNAMETAL	KYOCERA	KOMET	HOLEX
Side									
	SE...	SECN	12	622					
		SEEN	12	622					
		SEET	12 / 13	621 / 624					
		SEHT	12	624					
		SEHW	12	624					
		SEKA	12	624					
		SEKN	12	622					
		SEKR	12	622					
		SEKT	12	624					
		SEKW	12	624					
		SEMT	13	621					
	SO... special	SOET	08 / 12	628 / 630					
		SOMT	08 / 09 / 12 / 10 / 14	628–631			689		
		SYHU	07			690			
		SZMU	08			696			
T... Triangle 60°	TO... special	TOHT	16					653	
		TOHX	09 / 14					653	
		TOMT	06				697		
		TPR	10			700			
		TP.T	10			700			
		TD.R	15			700			
		TD.T	15			700			
V... Rhombus 35°	VC...	VCGT	22	592					
		VCGX	22	592					
		VDGT	11	593					
W... Trigon 80°	WN...	WNEU	08				695		
		WNMU	08				695		
Z... Special shape	ZD...	ZDET	16				681		
		ZDHT	15	589					
X... Special shape	XN...	XNEU	05 / 14	620					
		XNMU	04 / 09 / 13			683 / 709			
	XP...	XPLT	06				685		
	XD...	XDHW	06 / 10	672					
		XD.T	07 / 09 / 12	614 / 615					
		XDLW	07 / 09 / 12	614 / 615			685		
		XDMT	09 / 12	608					
		XDMW	09 / 12	608					
		XDPW	07 / 09 / 12	614 / 615					
	XE...	XEEW	13	621					
		XELT	16				685		
		XELW	16				685		
		XNEX	04	633					
		XNEX	08	632					632
	XO... special	XOEW	08 / 12	628 / 630					
		XOMT	06	608					
		XOMU	09	611					
		XOMU	14	611					
		XOMW	06	608					
		Copy	08 – 32	603					
		Polygon	Type P12 / P16 / P26	658–662					
		3-square	Type 1 / 2 / 3 / 4	663–664					
		Cutting	a _p = 1.0 – 5.0	665 / 668–671					
		Radii	1–5	656					
		Engraving		657					



Garant Aluminium shoulder mill for ZDHT 1505

High-performance milling system for high cutting speeds. Absolutely precise insert bedding. Exceptional torsional stiffness thanks to optimised protection against centrifugal force.

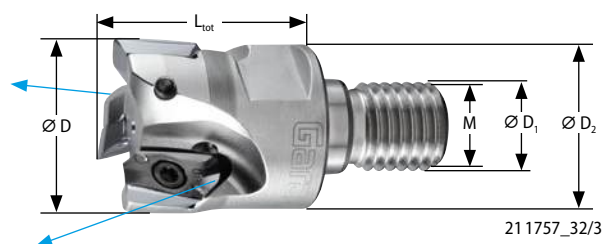
Attention: Before using the indexable insert No. 211776 ALU ($r = 5.0$ mm) and 211777 ALU ($r = 6.0$ mm), the insert seats of the carrier must be modified.

Note: The **recommended torque** for fastening the insert screws No. 219878 4 and 219878 5 is **3.2 Nm**.



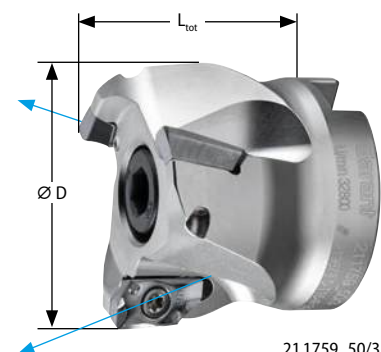
21 1755_32/2

Ø D / number of effective cutting edges Z	210	21 1755	L ₁	L _{tot}	Ø D ₅ h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
		Aluminium shoulder mill									
		Plain shank	mm	mm	mm	mm	mm	mm	degrees	mm	
25/2		eShop	32	88	25	40	48	7.6	6.81	12.56	219878 4 (15IP)
32/2		eShop	40	100	32	54	62	8	4.39	19.56	219878 4 (15IP)
32/3		eShop	40	100	32	54	62	8	4.39	19.56	219878 4 (15IP)
40/3		eShop	50	110	32	70	78	9	3.12	27.56	219878 4 (15IP)



21 1757_32/3

Ø D / number of effective cutting edges Z	210	21 1757	L _{tot}	Ø D ₁ h6	Ø D ₂	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
		Aluminium shoulder mill										
		with threaded shank	mm	mm	mm		mm	mm	mm	degrees	mm	
25/2		eShop	35	12.5	21	M12	40	48	7.6	6.81	12.56	219878 4 (15IP)
32/2		eShop	35	17	29	M16	54	62	8	4.39	19.56	219878 4 (15IP)
32/3		eShop	35	17	29	M16	54	62	8	4.39	19.56	219878 4 (15IP)
42/3		eShop	40	17	29	M16	74	82	9	2.9	29.56	219878 4 (15IP)
42/4		eShop	40	17	29	M16	74	82	9	2.9	29.56	219878 4 (15IP)



21 1759_50/3

Ø D / number of effective cutting edges Z	210	21 1759	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
		Aluminium shoulder mill								
		with bore	mm	mm	mm	mm	mm	degrees	mm	
40/3		eShop	40	16	70	78	9	3.12	27.56	219878 4 (15IP)
50/3		eShop	40	22	90	98	8.4	2.29	37.56	219878 5 (15IP)
50/4		eShop	40	22	90	98	8.4	2.29	37.56	219878 5 (15IP)
63/4		eShop	40	22	116	124	8	1.7	50.56	219878 5 (15IP)
63/5		eShop	40	22	116	124	8	1.7	50.56	219878 5 (15IP)
80/5		eShop	50	27	150	158	7.6	1.27	67.56	219878 5 (15IP)

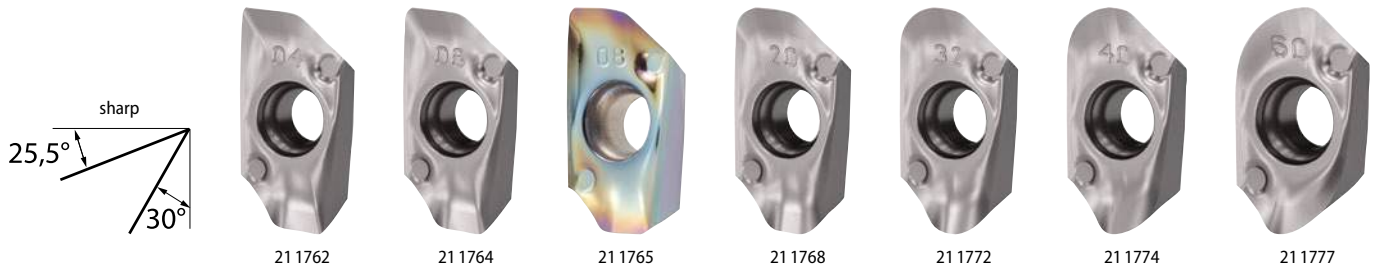
Garant Indexable milling inserts ZDHT1505.. for aluminium shoulder mill No. 211755 – 211759

Indexable inserts ground all round for a precise fit in the tool body. High-performance micro-grain substrate from the latest generation of tool materials. Optimised preparation of cutting edges for use in materials that are easy to machine.

Note:

21 1776/1777 – A carrier modification (insert seats) is required before use.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si												INOX	INOX	Ti	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
21 1762/ 1764–21 1777	2400	2200	1100																	●		○		
21 1765	2400	2400	1700																	●		○		



Type	ALU			
21A 21 1762	ZDHT 150504FR-F10	HU7705	eShop	10
21A 21 1764	ZDHT 150508FR-F10	HU7705	eShop	10
21A 21 1765	ZDHT 150508FR-F10 DLC coated	HB7805	eShop	1
21A 21 1766	ZDHT 150512 FR-F10	HU7705	eShop	10
21A 21 1767	ZDHT 150516 FR-F10	HU7705	eShop	10
21A 21 1768	ZDHT 150520FR-F10	HU7705	eShop	10
21A 21 1771	ZDHT 150530FR-F10	HU7705	eShop	10
21A 21 1772	ZDHT 150532FR-F10	HU7705	eShop	10
21A 21 1774	ZDHT 150540FR-F10	HU7705	eShop	10
21A 21 1776	ZDHT 150550FR-F10	HU7705	eShop	10
21A 21 1777	ZDHT 150560FR-F10	HU7705	eShop	10
f_z	mm			0.1 – 0.25

Garant

VERSATILE ALUMINIUM SHOULDER MILL.

The aluminium shoulder mill can also be used for machining plastics and aluminium composite materials. We have the answer to your machining requirements.

Just contact us!



Our ToolScout is easy to use – for intelligent tool selection and to determine technological data:
<https://hog.tools/toolscout>

21



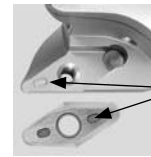
MTC



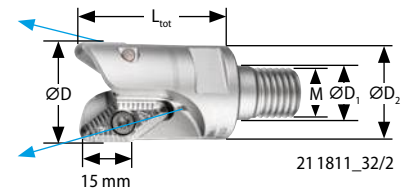
Garant Plunge milling cutters 90° and 93° MTC for VCG. 2205..

Greater tool stiffness by elimination of twist between indexable insert and insert seat.

Note: Use GARANT torque screwdriver TQ No. **211750** size **5.7** with bit No. **674252** size **20IP**.



Positive engagement

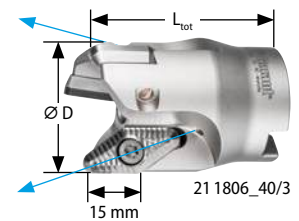


21 1811_32/2

Plunge milling cutter 90° for VCG. 2205..



Ø D / number of teeth Z	210 21 1811 Plunge milling cutter 90° with threaded shank	Ø D ₁ h6	Ø D ₂	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
mm	mm	mm	mm	mm		mm	mm	mm	degrees	mm		
32/2	eShop	17	29	47	M16	58	62	4	7.65	22.34	VCG. 2205	219800 (20IP; 5.7 Nm)
40/3	eShop	17	29	47	M16	74	78	8	5.65	30.34	VCG. 2205	219800 (20IP; 5.7 Nm)
42/3	eShop	17	29	47	M16	78	82	8	5.3	32.34	VCG. 2205	219800 (20IP; 5.7 Nm)



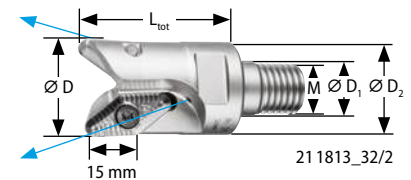
21 1806_40/3

Ø D / number of teeth Z	210 21 1806 Plunge milling cutter 90° with bore	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
mm	mm	mm	mm	mm	mm	mm	degrees	mm		
40/3	eShop	55	16	74	78	8	5.65	30.34	VCG. 2205	219800 (20IP; 5.7 Nm)
42/3	eShop	55	16	78	82	8	5.3	32.34	VCG. 2205	219800 (20IP; 5.7 Nm)
50/4	eShop	55	22	94	98	10	4.25	40.34	VCG. 2205	219800 (20IP; 5.7 Nm)
52/3	eShop	55	22	98	102	10	4.05	42.34	VCG. 2205	219800 (20IP; 5.7 Nm)
63/4	eShop	55	22	120	124	10	3.22	53.34	VCG. 2205	219800 (20IP; 5.7 Nm)
66/4	eShop	55	27	126	130	10	3.05	56.34	VCG. 2205	219800 (20IP; 5.7 Nm)
80/5	eShop	55	27	154	158	10	2.44	70.34	VCG. 2205	219800 (20IP; 5.7 Nm)

Plunge milling cutter 93° for VCG. 2205..

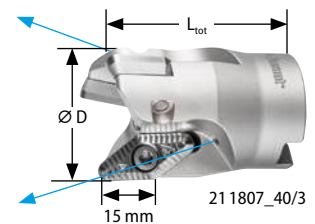


Application: To prevent chips jamming, especially when milling deep pockets.



21 1813_32/2

Ø D / number of teeth Z	210 21 1813 Plunge milling cutter 93° with threaded shank	Ø D ₁ h6	Ø D ₂	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
mm	mm	mm	mm	mm		mm	mm	mm	degrees	mm		
32/2	eShop	17	29	47	M16	58	62	4	7.65	22.34	VCG. 2205	219800 (20IP; 5.7 Nm)
40/3	eShop	17	29	47	M16	74	78	8	5.65	30.34	VCG. 2205	219800 (20IP; 5.7 Nm)
42/3	eShop	17	29	47	M16	78	82	8	5.3	32.34	VCG. 2205	219800 (20IP; 5.7 Nm)



21 1807_40/3

Ø D / number of teeth Z	210 21 1807 Plunge milling cutter 93° with bore	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
mm	mm	mm	mm	mm	mm	mm	degrees	mm		
40/3	eShop	55	16	74	78	8	5.65	30.34	VCG. 2205	219800 (20IP; 5.7 Nm)
42/3	eShop	55	16	78	82	8	5.3	32.34	VCG. 2205	219800 (20IP; 5.7 Nm)
50/4	eShop	55	22	94	98	10	4.25	40.34	VCG. 2205	219800 (20IP; 5.7 Nm)
52/3	eShop	55	22	98	102	10	4.05	42.34	VCG. 2205	219800 (20IP; 5.7 Nm)
63/4	eShop	55	22	120	124	10	3.22	53.34	VCG. 2205	219800 (20IP; 5.7 Nm)
66/4	eShop	55	27	126	130	10	3.05	56.34	VCG. 2205	219800 (20IP; 5.7 Nm)
80/5	eShop	55	27	154	158	10	2.44	70.34	VCG. 2205	219800 (20IP; 5.7 Nm)

Garant Milling inserts for plunge milling cutters No. 211806 – 211813

21 1860 – **Diamond-coated** milling insert for higher cutting speeds and longer tool life in materials with silicon content.

21 1853–1861 – Fine-grain substrate, polished chip breaker steps – extreme reduction in the tendency to edge build-up.

Note: a_p max = 7 mm for roughing with $a_e = 1 \times D$.

Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	Ti	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N				
21 1853–59/ 21 1861	1900	1900	500															400	100	●		○	
21 1860	1900	1900	680																●	●		○	



21 1853



21 1856



21 1857



21 1859



21 1861



21 1860

Type				ALU	
21A 21 1853	VCGX 220505 FR	HU7810		eShop	10
21A 21 1856	VCGX 220508 FR	HU7810		eShop	10
21A 21 1857	VCGX 220516 FR	HU7810		eShop	10
21A 21 1859	VCGX 220520 FR	HU7810		eShop	10
21A 21 1861	VCGT 220530 FN	HU7810		eShop	10
21B 21 1860	VCGT 220530 FN diamond-coated	HB7810		eShop	1
f _z	mm			0.25	



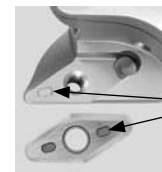
MTC



Garant Plunge milling cutter 90° and 93° MTC for VDGT 11T2..

Greater tool stiffness by elimination of twist between indexable insert and insert seat.

Note: Use GARANT torque screwdriver TQ No. **211750** size **0.9** with bit No. **674252** size **7IP**.

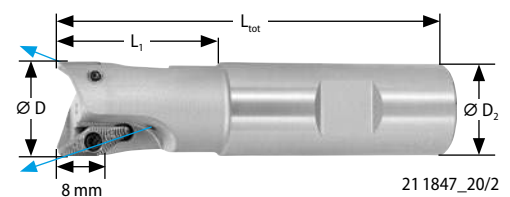


Positive engagement

Plunge milling cutter 90° for VDGT 11T2..

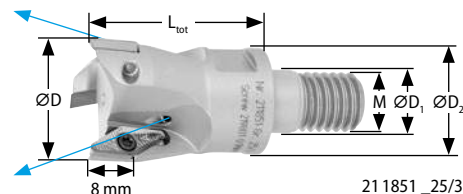


90°



21 1847_20/2

Ø D / number of teeth Z	210 21 1847	L_1	L_{tot}	Ø D_s h6	Circular interpolation milling Ø D_{min}	Circular interpolation milling Ø D_{max}	Circular interpolation milling a_p	Ramping angle α_{max}	Ramping length L for α_{max}	suitable indexable insert	Set of insert screws
	Plunge milling cutter 90°										
mm	Weldon shank	mm	mm	mm	mm	mm	mm	degrees	mm		
16/2	eShop	30	80	16	30	30	3.5	6.9	12.4	VDGT 11T2..	219801 (7IP; 0.9 Nm)
20/2	eShop	35	85	20	38	38	3.5	5.23	16.4	VDGT 11T2..	219801 (7IP; 0.9 Nm)
25/3	eShop	35	90	25	48	48	3.5	4.01	21.4	VDGT 11T2..	219801 (7IP; 0.9 Nm)



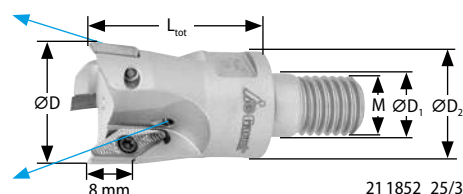
21 1851 _25/3

Ø D / number of teeth Z	210 21 1851 Plunge milling cutter 90°	Ø D ₁ h6	Ø D ₂	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
mm	with threaded shank	mm	mm	mm		mm	mm	mm	degrees	mm		
16/2	eShop	8.5	12.7	35	M8	30	30	3.5	6.9	12.4	VDGT 11T2..	219801 (71P; 0.9 Nm)
20/2	eShop	10.5	17.7	35	M10	38	38	3.5	5.23	16.4	VDGT 11T2..	219801 (71P; 0.9 Nm)
25/3	eShop	12.5	20.7	35	M12	48	48	3.5	4.01	21.4	VDGT 11T2..	219801 (71P; 0.9 Nm)
32/4	eShop	17	28.7	42	M16	62	62	3.5	3.02	28.4	VDGT 11T2..	219801 (71P; 0.9 Nm)

Plunge milling cutter 93° for VDGT 11T2..



Application: To prevent chips jamming, especially when milling deep pockets.



21 1852 _25/3

Ø D / number of teeth Z	210 21 1852 Plunge milling cutter 93°	Ø D ₁ h6	Ø D ₂	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
mm	with threaded shank	mm	mm	mm		mm	mm	mm	degrees	mm		
16/2	eShop	8.5	12.7	35	M8	30	30	3.5	6.9	12.4	VDGT 11T2..	219801 (71P; 0.9 Nm)
20/2	eShop	10.5	17.7	35	M10	38	38	3.5	5.23	16.4	VDGT 11T2..	219801 (71P; 0.9 Nm)
25/3	eShop	12.5	20.7	35	M12	48	48	3.5	4.01	21.4	VDGT 11T2..	219801 (71P; 0.9 Nm)
32/4	eShop	17	28.7	42	M16	62	62	3.5	3.02	28.4	VDGT 11T2..	219801 (71P; 0.9 Nm)

Garant Milling inserts for plunge milling cutters No. 211847 – 211852

21 1864 – **Diamond-coated** milling insert for higher cutting speeds and longer tool life in materials with silicon content.

21 1865–1868 – Fine-grain substrate, polished chip breaker steps – extreme reduction of the tendency to edge build-up.

Note: a_p max = 3 mm for roughing with a_e = 1×D.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
21 1864	1900	1900	680															●		●		○	
21 1865–21 1868	1900	1900	500														400	100	●		○		



21 1867



21 1868

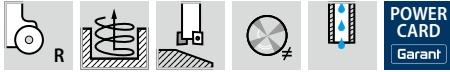


21 1865



21 1864

Type	ALU			
21A 21 1867	VDGT 11T204 FR	HU7810	eShop	10
21A 21 1868	VDGT 11T208 FR	HU7810	eShop	10
21A 21 1865	VDGT 11T210 FN	HU7810	eShop	10
21B 21 1864	VDGT 11T210 FN diamond coated	HB7810	eShop	1
f _t	mm			0.17

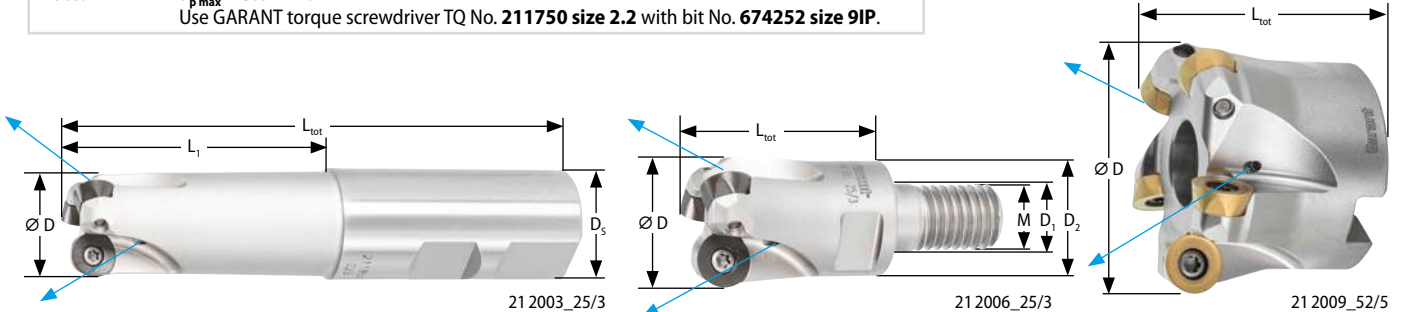


Garant Copy and face mills, indexed for RPK.10T3, RPK.1204

The latest generation of copy and face milling cutters. Indexed round inserts ensure stable conditions and secure the insert against accidental twisting during use. The optimised form fit between the indexable insert and insert seat ensures exceptional process reliability.

Copy and face mills, indexed for RPK.10T3

Note: $a_{p\max} = 5.0 \text{ mm}$.
Use GARANT torque screwdriver TQ No. 211750 size 2.2 with bit No. 674252 size 9IP.



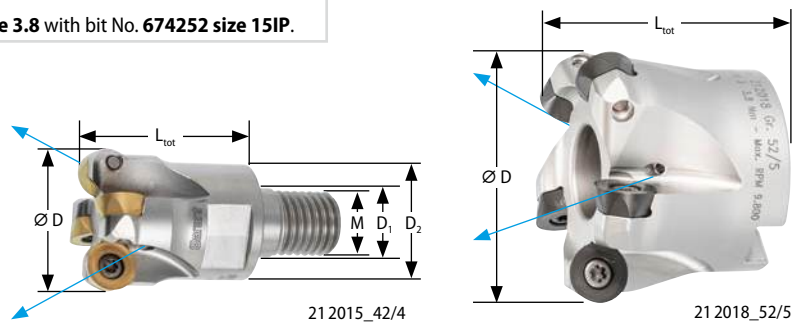
Ø D / number of effective cutting edges Z	21 2003	Number of cutting edges Z	L ₁	L _{tot}	Ø D ₅ h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
mm	Copy and face mills, indexed		mm	mm	mm	mm	mm	mm	degrees	mm	
20/2	Weldon shank	2	55	105	20	30	38	0.7	5.37	7.45	219878 2 (9IP; 2.2 Nm)
20/2L	eShop	2	100	155	20	30	38	0.7	5.37	7.45	219878 2 (9IP; 2.2 Nm)
25/3	eShop	3	59	115	25	40	48	1.6	3.22	12.45	219878 2 (9IP; 2.2 Nm)

Ø D / number of effective cutting edges Z	21 2006	Number of cutting edges Z	Ø D ₁ h6	Ø D ₂	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
mm	Copy and face mills, indexed		mm	mm	mm		mm	mm	mm	degrees	mm	
20/2	with threaded shank	2	10.5	17.7	30	M10	30	38	0.7	5.37	7.45	219878 2 (9IP; 2.2 Nm)
25/3	eShop	3	12.5	20.7	35	M12	40	48	1.6	3.22	12.45	219878 2 (9IP; 2.2 Nm)
32/4	eShop	4	17	28.7	42	M16	54	62	2.5	2.06	19.45	219878 2 (9IP; 2.2 Nm)
35/3	eShop	3	17	28.7	42	M16	60	68	2.5	1.79	22.45	219878 2 (9IP; 2.2 Nm)
35/5	eShop	5	17	28.7	42	M16	60	68	2.5	1.79	22.45	219878 2 (9IP; 2.2 Nm)
42/5	eShop	5	17	28.7	42	M16	74	82	2.5	1.36	29.45	219878 2 (9IP; 2.2 Nm)

Ø D / number of effective cutting edges Z	21 2009	Number of cutting edges Z	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
mm	Copy and face mills, indexed		mm	mm	mm	mm	mm	degrees	mm	
35/3	with bore	3	40	16	60	68	2.5	1.79	22.45	219878 2 (9IP; 2.2 Nm)
35/4	eShop	4	40	16	60	68	2.5	1.79	22.45	219878 2 (9IP; 2.2 Nm)
52/5	eShop	5	40	22	94	102	2.5	1.02	39.45	219878 2 (9IP; 2.2 Nm)
52/6	eShop	6	40	22	94	102	2.5	1.02	39.45	219878 2 (9IP; 2.2 Nm)

Copy and face mills, indexed for RPK.1204

Note: $a_{p\max} = 6.0 \text{ mm}$.
Use GARANT torque screwdriver TQ No. 211750 size 3.8 with bit No. 674252 size 15IP.



Ø D / number of effective cutting edges Z	21 2015	Number of cutting edges Z	Ø D ₁ h6	Ø D ₂	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
mm	Copy and face mills, indexed		mm	mm	mm		mm	mm	mm	degrees	mm	
25/2	with threaded shank	2	12.5	20.7	35	M12	38	48	1.7	4.83	9.94	219878 3 (15IP; 3.8 Nm)
32/3	eShop	3	17	28.7	42	M16	52	62	4	2.84	16.94	219878 3 (15IP; 3.8 Nm)
35/3	eShop	3	17	28.7	42	M16	58	68	4	2.41	19.94	219878 3 (15IP; 3.8 Nm)
42/4	eShop	4	17	28.7	42	M16	72	82	4	1.79	26.94	219878 3 (15IP; 3.8 Nm)

Ø D / number of effective cutting edges Z	210	21 2018	Number of cutting edges Z	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
		Copy and face mills, indexed									
mm		with bore		mm	mm	mm	mm	mm	degrees	mm	
42/4		eShop	4	40	16	72	82	4	1.79	26.94	219878 3 (15IP; 3.8 Nm)
52/5		eShop	5	40	22	92	102	4	1.3	36.94	219878 3 (15IP; 3.8 Nm)
63/6		eShop	6	40	22	114	124	4	1	47.94	219878 3 (15IP; 3.8 Nm)
66/6		eShop	6	50	27	120	130	4	0.94	50.94	219878 3 (15IP; 3.8 Nm)
80/7		eShop	7	50	27	148	158	4	0.74	64.94	219878 3 (15IP; 3.8 Nm)
100/9		eShop	9	50	32	188	198	4	0.57	84.94	219878 3 (15IP; 3.8 Nm)
125/10		eShop	10	63	40	238	248	4	0.44	109.94	219878 3 (15IP; 3.8 Nm)

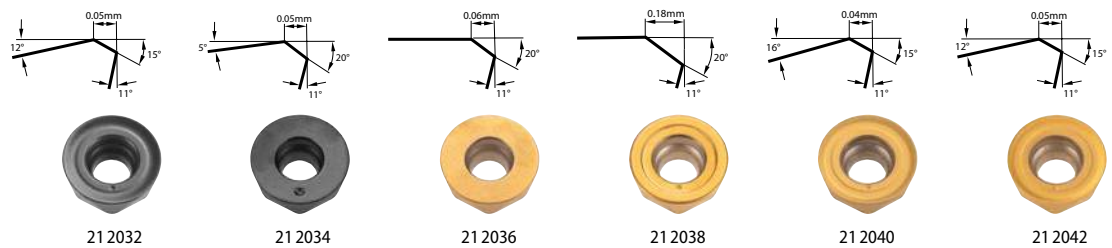
Garant Milling inserts RPK.10T3 and RPK.1204 for copy and face mills, indexed No. 212003 – 212018

Round inserts with sixfold indexing. Taking the maximum cutting depth into account, six fully functional cutting edges are produced.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 50 HRC	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
21 2032/2052				360	290	250	200										220			○	○	●	●
21 2034/2054					330	260	230	180									200			○	○	●	●
21 2036/2056									120	100	70	55					200			○	○	●	●
21 2038/2058								160	110	90	65	50					200			○	○	●	●
21 2040/2060														220	160	60				○	○	●	●
21 2042/2062				330	255	210	180	150						180	120		130	●		●	●	●	●

Milling inserts RPK.10T3 MOT

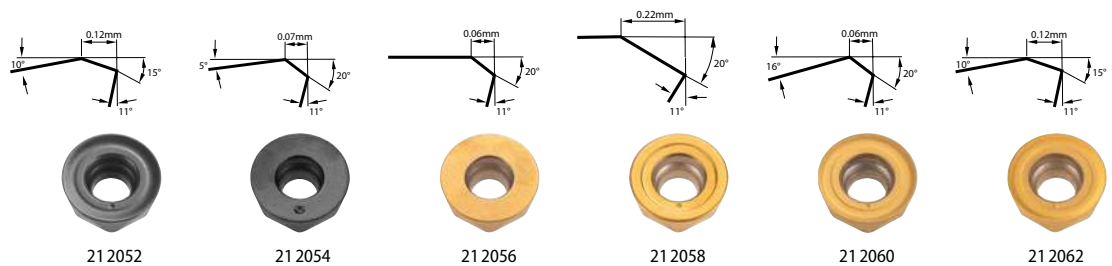
Note: Standard application values for a_p = 0.3×D / a_p = 1 mm.
In order to use all six cutting edges, an a_p of 2.5 mm must not be exceeded.



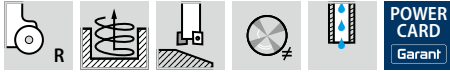
Type		ST900	ST1400	HART	INOX	UNI	f _z mm
21A 21 2032	RPKT 10T3MOT	HB7525	eShop	—	—	—	10 0.3
21A 21 2034		HB7515	eShop	—	—	—	10 0.35
21A 21 2036	RPKW 10T3MOT	HB7605	—	eShop	—	—	10 0.2
21A 21 2038		HB7605	—	eShop	—	—	10 0.25
21A 21 2040	RPKT 10T3MOT	HB7635	—	—	eShop	—	10 0.15
21A 21 2042		HB7635	—	—	—	eShop	10 —

Milling inserts RPK.1204 MOT

Note: Standard application values for a_p = 0.3×D / a_p = 1.2 mm.
In order to use all six cutting edges, an a_p of 3 mm must not be exceeded.



Type		ST900	ST1400	HART	INOX	UNI	f _z mm
21A 21 2052	RPKT 1204MOT	HB7525	eShop	—	—	—	10 0.35
21A 21 2054		HB7515	eShop	—	—	—	10 0.35
21A 21 2056	RPKW 1204MOT	HB7605	—	eShop	—	—	10 0.2
21A 21 2058		HB7605	—	eShop	—	—	10 0.15
21A 21 2060	RPKT 1204MOT	HB7635	—	—	eShop	—	10 0.15
21A 21 2062		HB7635	—	—	—	eShop	10 —



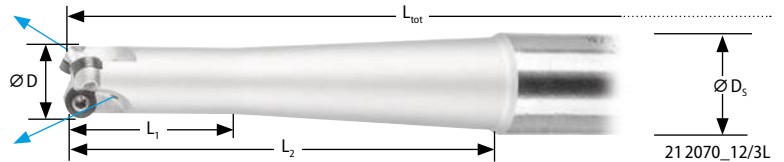
Garant Copy and face mills for RD..0501, RD..0702

Milling body with irregular pitch for smooth cutting.

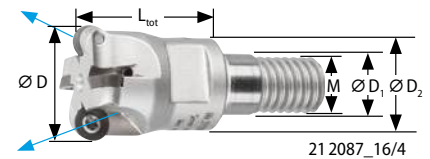
- High axial run-out accuracy and concentricity
- Stepless repositioning of the insert as the cutting edge wears.

Copy and face mills for RD..0501

Note: $a_{p\max} = 1.1 \text{ mm}$.
Use GARANT torque screwdriver TQ No. **211750 size 0.6** with bit No. **674252 size 6IP**.



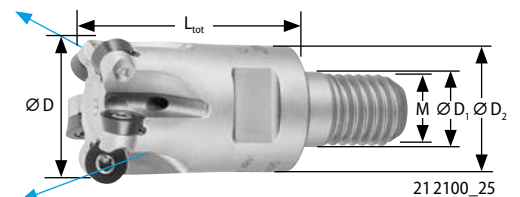
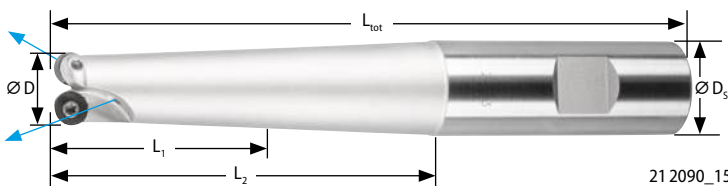
Ø D / number of effective cutting edges Z mm	210 21 2070 Copy mill 0° negative Plain shank	Number of cutting edges Z	L ₁ mm	L ₂ mm	L _{tot} mm	Ø D _s h6 mm	Circular inter- polation mill- ing Ø D _{min} mm	Circular inter- polation mill- ing Ø D _{max} mm	Circular inter- polation mill- ing a _p mm	Ramping angle α _{max} degrees	Ramping length L for α _{max} mm	Set of insert screws
10	eShop	2	30	—	70	10	15	18	1.1	5.37	3.72	219802 (6IP; 0.6 Nm)
10/2	eShop	2	14	—	70	8	15	18	1.1	5.37	3.72	219802 (6IP; 0.6 Nm)
10/2L	eShop	2	39	—	110	12	15	18	1.1	5.37	3.72	219802 (6IP; 0.6 Nm)
12	eShop	3	30	—	75	12	19	22	1.1	3.5	5.72	219802 (6IP; 0.6 Nm)
12/3	eShop	3	15	—	75	10	19	22	1.1	3.5	5.72	219802 (6IP; 0.6 Nm)
12/3L	eShop	3	30	70	120	16	19	22	1.1	3.5	5.72	219802 (6IP; 0.6 Nm)
15	eShop	4	30	—	80	16	25	28	1.1	2.3	8.72	219802 (6IP; 0.6 Nm)
16	eShop	4	30	—	80	16	27	30	1.1	2.06	9.72	219802 (6IP; 0.6 Nm)
16/4	eShop	4	20	—	80	14	27	30	1.1	2.06	9.72	219802 (6IP; 0.6 Nm)



Ø D / number of teeth Z mm	210 21 2087 Copy mill 0° negative with threaded shank	Number of cutting edges Z	Ø D ₁ h6 mm	Ø D ₂ mm	L _{tot} mm	Mounting thread M	Circular inter- polation mill- ing Ø D _{min} mm	Circular inter- polation mill- ing Ø D _{max} mm	Circular inter- polation mill- ing a _p mm	Ramping angle α _{max} degrees	Ramping length L for α _{max} mm	Set of insert screws
10/2	eShop	2	5.5	9.75	20	M5	15	18	1.1	5.37	3.72	219802 (6IP; 0.6 Nm)
12/3	eShop	3	8.5	11.75	20	M8	19	22	1.1	3.5	5.72	219802 (6IP; 0.6 Nm)
16/4	eShop	4	8.5	12.7	20	M8	27	30	1.1	2.06	9.72	219802 (6IP; 0.6 Nm)

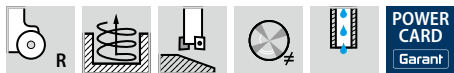
Copy and face mills for RD..0702

Note: $a_{p\max} = 1.5 \text{ mm}$.
Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit shank No. **674252 size 8IP**.



Ø D mm	210 21 2090 Copy mill 0° negative Weldon shank	Number of cutting edges Z	L ₁ mm	L ₂ mm	L _{tot} mm	Ø D _s h6 mm	Circular inter- polation mill- ing Ø D _{min} mm	Circular inter- polation mill- ing Ø D _{max} mm	Circular inter- polation mill- ing a _p mm	Ramping angle α _{max} degrees	Ramping length L for α _{max} mm	Set of insert screws
15	eShop	2	24.5	40	90	16	23	28	1.5	4.51	6.23	219803 (8IP; 1.2 Nm)
15L	eShop	2	26	80	135	20	23	28	1.5	4.51	6.23	219803 (8IP; 1.2 Nm)
16L	eShop	2	26	80	135	20	25	30	1.5	3.89	7.23	219803 (8IP; 1.2 Nm)

Ø D mm	210 21 2100 Copy mill 0° negative with threaded shank	Number of cutting edges Z	Ø D ₁ h6 mm	Ø D ₂ mm	L _{tot} mm	Mounting thread M	Circular inter- polation mill- ing Ø D _{min} mm	Circular inter- polation mill- ing Ø D _{max} mm	Circular inter- polation mill- ing a _p mm	Ramping angle α _{max} degrees	Ramping length L for α _{max} mm	Set of insert screws
15	eShop	2	8.5	12.7	23	M8	23	28	1.5	4.51	6.21	219803 (8IP; 1.2 Nm)
16	eShop	3	8.5	12.7	23	M8	25	30	1.5	3.89	7.21	219803 (8IP; 1.2 Nm)
20	eShop	4	10.5	17.7	30	M10	33	38	1.5	2.5	11.21	219803 (8IP; 1.2 Nm)
25	eShop	5	12.5	20.7	35	M12	43	48	1.5	1.73	16.21	219803 (8IP; 1.2 Nm)
32	eShop	5	17	28.7	42	M16	57	62	1.5	1.21	23.21	219803 (8IP; 1.2 Nm)
35	eShop	6	17	28.7	42	M16	63	68	1.5	1.07	26.21	219803 (8IP; 1.2 Nm)



Garant Copy and face mills for RD..1003

Milling body with irregular pitch for smooth cutting.

- High axial run-out accuracy and concentricity
- Stepless repositioning of the insert as the cutting edge wears.

21 2115/2130/2140 – Vibration reduction and soft cutter edge entry due to 7° positive setting of the indexable inserts.

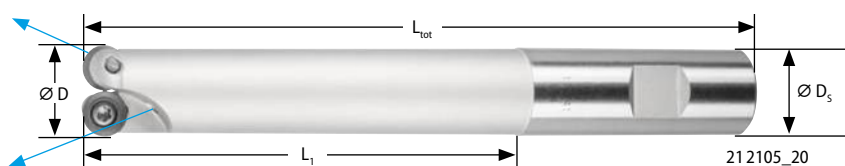
Note: $a_{p\max} = 2$ mm.
Use GARANT torque screwdriver TQ No. **211750 size 3.8** with bit No. **674252 size 15IP**.



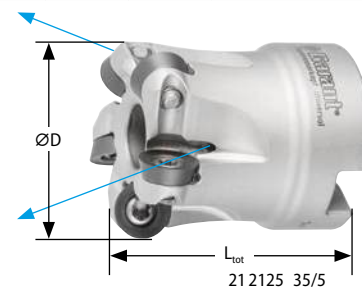
Indexable insert set to 0° negative.



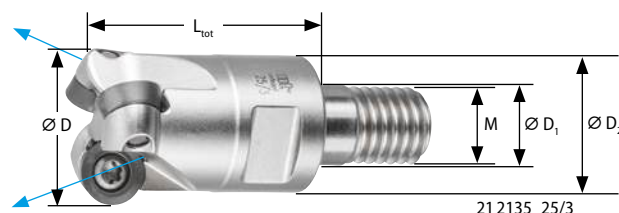
Indexable insert set to 7° positive.



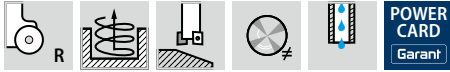
Ø D	210	21 2105	210	21 2115	Number of cutting edges Z	L ₁		L _{tot}		Ø D _s h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
	Copy mill															
	0° negative Weldon shank	7° positive Weldon shank	21 2105	21 2115		21 2105	21 2115									
mm					mm	mm	mm	mm	mm	mm	mm	mm	degrees	mm		
20	eShop	eShop	2	60	47	115	100	20	30	38	2	5.37	7.45	219804 (15IP; 3.8 Nm)		
20L	eShop	—	2	100	—	155	—	20	30	38	2	5.37	7.45	219804 (15IP; 3.8 Nm)		
25	eShop	eShop	3	35	48	107	100	20	40	48	2	3.22	12.45	219804 (15IP; 3.8 Nm)		
25L	eShop	—	2	70	—	180	—	25	40	48	2	3.22	12.45	219804 (15IP; 3.8 Nm)		



Ø D / number of teeth Z	210	21 2125	210	21 2130	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
	Copy mill											
	0° negative with bore	7° positive with bore										
mm					mm	mm	mm	mm	mm	degrees	mm	
35/3		eShop		—	40	16	60	68	2	1.79	22.45	219804 (15IP; 3.8 Nm)
35/5		eShop		eShop	40	16	60	68	2	1.79	22.45	219804 (15IP; 3.8 Nm)
42/6		eShop		eShop	40	16	74	82	2	1.36	29.45	219804 (15IP; 3.8 Nm)
52/5		eShop		eShop	50	22	94	102	2	1.02	39.45	219804 (15IP; 3.8 Nm)
52/7		eShop		—	50	22	94	102	2	1.02	39.45	219804 (15IP; 3.8 Nm)



Ø D / number of teeth Z	210	21 2135	210	21 2140	Ø D ₁ h6	L _{tot}	Ø D ₂	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
mm	Copy mill				mm	mm	mm		21 2135	21 2135	21 2135	21 2135	21 2135	219804 (15IP; 3.8 Nm)
	0° negative with threaded shank	7° positive with threaded shank							mm	mm	mm	degrees	mm	
20/2	eShop	eShop			10.5	30	17.7	M10	30	38	2	5.37	7.45	219804 (15IP; 3.8 Nm)
25/2	eShop	—			12.5	35	20.7	M12	40	48	2	3.22	12.45	219804 (15IP; 3.8 Nm)
25/3	eShop	eShop			12.5	35	20.7	M12	40	48	2	3.22	12.45	219804 (15IP; 3.8 Nm)
32/4	eShop	—			17	42	28.7	M16	54	62	2	2.06	19.45	219804 (15IP; 3.8 Nm)
35/5	eShop	eShop			17	42	28.7	M16	60	68	2	1.79	22.45	219804 (15IP; 3.8 Nm)
42/5	eShop	eShop			17	42	28.7	M16	74	82	2	1.36	29.45	219804 (15IP; 3.8 Nm)
42/6	eShop	eShop			17	42	28.7	M16	74	82	2	1.36	29.45	219804 (15IP; 3.8 Nm)



Garant Copy and face mills for RD..12T3, RD..1604

Milling body with irregular pitch for smooth cutting.

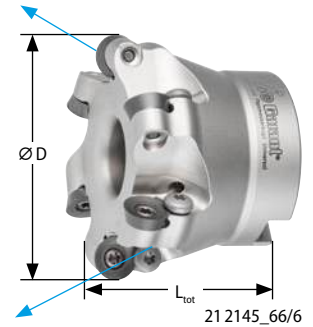
- High axial run-out accuracy and concentricity
- Stepless repositioning as the cutting edge wears.

Attention: Retaining screws and retaining washers should **not** be used for inserts with positive geometry.

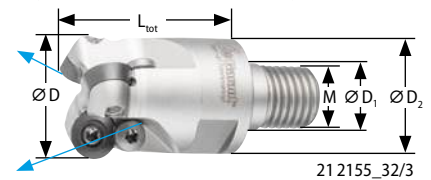
Copy and face mills for RD..12T3

21 2150/2160 – Vibration reduction and soft cutter edge entry due to 7° positive setting of the indexable inserts.

Note: $a_{p\max} = 2.5 \text{ mm}$.
Use GARANT torque screwdriver TQ No. **211750 size 3.8** with bit No. **674252 size 15IP**.



Ø D / number of teeth Z	210 21 2145	210 21 2150	L _{tot}	Mounting bore Ø	Circular inter- polation milling Ø D _{min}	Circular inter- polation milling Ø D _{max}	Circular inter- polation milling a _p	Ramping angle α _{max}	Ramping length L for a _{max}	Set of insert screws	Set of retaining screws
	Copy mill										
	0° negative with bore	7° positive with bore			21 2145	21 2145	21 2145	21 2145	21 2145		
mm			mm	mm	mm	mm	mm	degrees	mm		
42/4	eShop	–	40	16	72	82	2.5	1.79	26.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
48/4	eShop	–	50	22	84	94	2.5	1.46	32.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
52/5	eShop	eShop	50	22	92	102	2.5	1.3	36.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
63/6	eShop	eShop	50	22	114	124	2.5	1	47.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
66/6	eShop	eShop	50	27	120	130	2.5	0.94	50.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
80/7	eShop	eShop	50	27	148	158	2.5	0.74	64.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
100/9	eShop	–	50	32	188	198	2.5	0.57	84.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
125/10	eShop	–	63	40	238	248	2.5	0.44	109.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)



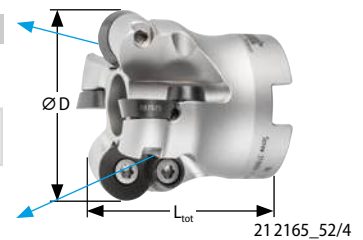
Ø D / number of teeth Z	210 21 2155	210 21 2160	Ø D ₁ h6	L _{tot}	Ø D ₂	Mounting thread M	Circular inter- polation milling Ø D _{min}	Circular inter- polation milling Ø D _{max}	Circular inter- polation milling a _p	Ramping angle α _{max}	Ramping length L for a _{max}	Set of insert screws	Set of retaining screws
	Copy mill												
	0° negative with threaded shank	7° positive with threaded shank					21 2155	21 2155	21 2155	21 2155	21 2155		
mm			mm	mm	mm		mm	mm	mm	degrees	mm		
24/2	eShop	–	12.5	35	20.7	M12	36	46	2.5	5.37	8.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
32/3	eShop	eShop	17	42	28.7	M16	52	62	2.5	2.84	16.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
35/3	eShop	eShop	17	42	28.7	M16	58	68	2.5	2.41	19.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
35/4	eShop	–	17	42	28.7	M16	58	68	2.5	2.41	19.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)
42/4	eShop	eShop	17	42	28.7	M16	72	82	2.5	1.79	26.94	219805 (15IP; 3.8 Nm)	219807 (15IP; 3.8 Nm)

Copy and face mills for RD..1604

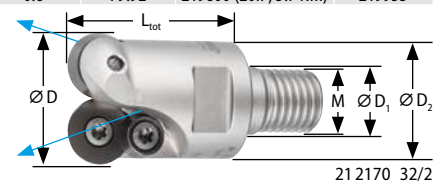
21 2167 – Vibration reduction and soft cutter edge entry due to 7° positive setting of the indexable inserts.

Application: With pack of insert screws No. 219800 - for securing indexable inserts and retaining washers.

Note: $a_{p\max} = 3.5 \text{ mm}$.
Use GARANT torque screwdriver TQ No. **211750 size 5.7** with bit No. **674252 size 20IP**.



Ø D / number of teeth Z	210 21 2165	210 21 2167	L _{tot}	Mounting bore Ø	Circular inter- polation milling Ø D _{min}	Circular inter- polation milling Ø D _{max}	Circular inter- polation milling a _p	Ramping angle α _{max}	Ramping length L for a _{max}	Set of insert screws	Set of retain- ing washers
	Copy mill										
	0° negative with bore	7° positive with bore			21 2165	21 2165	21 2165	21 2165	21 2165		
mm			mm	mm	mm	mm	mm	degrees	mm		
52/4	eShop	eShop	50	22	88	102	3.5	2.01	31.92	219800 (20IP; 5.7 Nm)	219955
66/5	eShop	eShop	50	27	116	130	3.5	1.4	45.92	219800 (20IP; 5.7 Nm)	219955
80/6	eShop	eShop	50	27	144	158	3.5	1.07	59.92	219800 (20IP; 5.7 Nm)	219955
100/7	eShop	eShop	50	32	184	198	3.5	0.8	79.92	219800 (20IP; 5.7 Nm)	219955



Ø D / number of teeth Z	210 21 2170	Ø D ₁ h6	L _{tot}	Ø D ₂	Mounting thread M	Circular inter- polation milling Ø D _{min}	Circular inter- polation milling Ø D _{max}	Circular inter- polation milling a _p	Ramping angle α _{max}	Ramping length L for a _{max}	Set of insert screws	Set of retain- ing washers
	Copy mill											
	0° negative with threaded shank											
mm		mm	mm	mm		mm	mm	mm	degrees	mm		
32/2	eShop	17	42	28.7	M16	48	62	3.5	5.37	11.92	219800 (20IP; 5.7 Nm)	219955

Milling inserts RD.. 1003 MO.., RD.. 12T3 MO.., RD.. 1604 MO..

21 2248 – With coating to visually detect wear.

Note: Standard application values for $a_e = 0.3 \times D / a_{pmax} = 2$ mm.

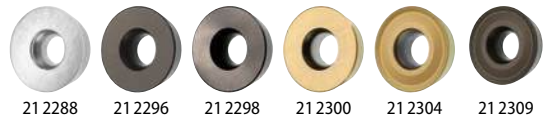
21 2248 – Mount with tightening value 3.0 Nm.



Type				ALU	ST900	ST1400	HART	INOX	UNI		f _z mm
NEW 21A 21 2230		RDHT 1003 MOFN positive	HU7710	eShop	–	–	–	–	–	10	0.22
21B 21 2232		RDHT 1003 diamond-coated, positive	HB7810	eShop	–	–	–	–	–	1	0.22
21A 21 2241		RDHW 1003 MOT	HB7525	–	eShop	–	–	–	–	10	0.22
21A 21 2242		RDHX 1003 MOTN	HB7525	–	eShop	–	–	–	–	10	0.22
21A 21 2243			HB7515	–	–	eShop	–	–	–	10	0.22
21A 21 2245		RDHW 1003 MOTN	HB7505	–	–	–	eShop	–	–	10	0.16
21A 21 2251	Garant	RDHW 1003 MOT	HB7605	–	–	–	eShop	–	–	10	0.16
21A 21 2248		RDHX 1003 MOTN	CBN925	–	–	–	eShop	–	–	1	0.16
21A 21 2249		RDHX 1003 MOT positive	HB7635	–	–	–	–	eShop	–	10	0.22
21A 21 2250		RDEX 1003 MOSN	HB7535	–	–	–	–	eShop	–	10	0.22
21A 21 2252		RDNX 1003 MOEN Positive	HB7635	–	–	–	–	eShop	–	10	0.22
21A 21 2254		RDHX 1003 MOT	HB735	–	–	–	–	–	eShop	10	–
21A 21 2255		RDHW 1003 MOTN	HB7520	–	–	–	–	–	eShop	10	–
NEW 22A 21 2257	HOLEX	RDMX 1003 MOT	HBM025	–	–	–	–	–	eShop	10	–

Note: Standard application values for $a_e = 0.3 \times D / a_{pmax} = 2.5$ mm.

Type				ALU	ST900	ST1400	HART	INOX	UNI		f _z mm
NEW 21A 21 2260		RDHT 12T3 MOFN positive	HU7710	eShop	–	–	–	–	–	10	0.22
21B 21 2262		RDHT 12T3 diamond-coated, positive	HB7810	eShop	–	–	–	–	–	1	0.22
21A 21 2271		RDHW 12T3 MOT	HB7525	–	eShop	–	–	–	–	10	0.22
21A 21 2272		RDHX 12T3 MOTN	HB7525	–	eShop	–	–	–	–	10	0.22
21A 21 2273			HB7515	–	–	eShop	–	–	–	10	0.22
21A 21 2275	Garant	RDMW 12T3 MOTN	HB7505	–	–	–	eShop	–	–	10	0.16
21A 21 2277		RDMW 12T3 MOT	HB7605	–	–	–	eShop	–	–	10	0.16
21A 21 2279		RDHX 12T3 MOT positive	HB7635	–	–	–	–	eShop	–	10	0.22
21A 21 2280		RDEX 12T3 MOSN	HB7535	–	–	–	–	eShop	–	10	0.22
21A 21 2282		RDNX 12T3 MOEN Positive	HB7635	–	–	–	–	eShop	–	10	0.22
21A 21 2284		RDHX 12T3 MOT	HB735	–	–	–	–	–	eShop	10	–
21A 21 2285		RDMW 12T3 MOTN	HB7520	–	–	–	–	–	eShop	10	–
NEW 22A 21 2287	HOLEX	RDMX 12T3 MOT	HBM025	–	–	–	–	–	eShop	10	–

Note: Standard application values for $a_e = 0.3 \times D / a_{pmax} = 3.5$ mm.

Type				ALU	ST900	ST1400	HART	INOX	UNI		f _z mm
NEW 21A 21 2288		RDHT 1604 MOFN positive	HU7710	eShop	–	–	–	–	–	10	0.4
21B 21 2290		RDHT 1604 diamond-coated, positive	HB7810	eShop	–	–	–	–	–	1	0.4
21A 21 2296		RDHW 1604 MOT	HB7525	–	eShop	–	–	–	–	10	0.3
21A 21 2297		RDHX 1604 MOTN	HB7525	–	eShop	–	–	–	–	10	0.3
21A 21 2298			HB7515	–	–	eShop	–	–	–	10	0.3
21A 21 2300	Garant	RDMW 1604 MOTN	HB7505	–	–	–	eShop	–	–	10	0.2
21A 21 2304		RDHX 1604 MOT positive	HB7635	–	–	–	–	eShop	–	10	0.3
21A 21 2305		RDEX 1604 MOSN	HB7535	–	–	–	–	eShop	–	10	0.3
21A 21 2307		RDNX 1604 MOEN Positive	HB7635	–	–	–	–	eShop	–	10	0.3
21A 21 2309		RDHX 1604 MOT	HB735	–	–	–	–	–	eShop	10	–
21A 21 2310		RDMW 1604 MOTN	HB7520	–	–	–	–	–	eShop	10	–



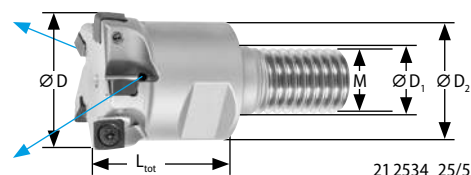
Garant Precision finishing mills for CPHX0602.. / CPHX09T3..

Precision finish milling for **extremely efficient en pre-finish machining and finish machining**.
Due to the revised wiper geometry, suitable for **outstanding surface quality** in **ground finish standard**.
Extreme time saving available due to a **large line skip** and a **high feed rate per tooth**.

Application: Typical tool for tool and die manufacturing.

Precision finishing mills for CPHX0602..

Note: GARANT torque screwdriver TQ No. **211750 size 1.0** with bit No. **674252 size 7IP**.

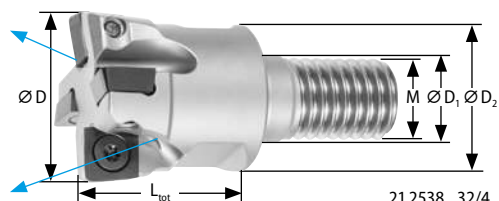


21 2534_25/5

Ø D / number of teeth Z	21 2534	maximum cutting depth $a_{p \max}$	Ø D ₁ h6	L _{tot}	Ø D ₂	Mounting thread M	suitable indexable insert	Set of insert screws
mm	Finishing mill with threaded shank	mm	mm	mm	mm			
16/3	eShop	2.5	8.5	23	13	M8	CPHX 0602..	219799 3 (7IP; 1.0 Nm)
20/4	eShop	2.5	10.5	30	18	M10	CPHX 0602..	219799 3 (7IP; 1.0 Nm)
25/5	eShop	2.5	12.5	35	21	M12	CPHX 0602..	219799 3 (7IP; 1.0 Nm)

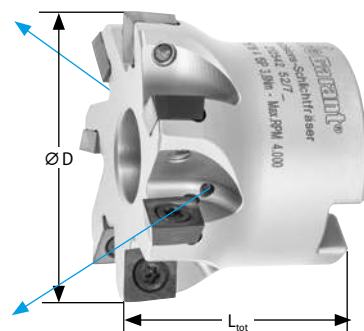
Precision finishing mills for CPHX09T3..

Note: GARANT torque screwdriver TQ No. **211750 size 3.8** with bit No. **674252 size 15IP**.



21 2538_32/4

Ø D / number of teeth Z	21 2538	maximum cutting depth $a_{p \max}$	Ø D ₁ h6	L _{tot}	Ø D ₂	Mounting thread M	suitable indexable insert	Set of insert screws
mm	Finishing mill with threaded shank	mm	mm	mm	mm			
25/3	eShop	3	12.5	35	21	M12	CPHX 09T3..	219799 4 (15IP; 3.8 Nm)
32/4	eShop	3	17	42	29	M16	CPHX 09T3..	219799 4 (15IP; 3.8 Nm)
35/4	eShop	3	17	42	29	M16	CPHX 09T3..	219799 4 (15IP; 3.8 Nm)
42/5	eShop	3	17	42	29	M16	CPHX 09T3..	219799 4 (15IP; 3.8 Nm)



21 2542_52/7

Ø D / number of teeth Z	21 2542	maximum cutting depth $a_{p \max}$	L _{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
mm	Finishing mill with bore	mm	mm	mm		
42/5	eShop	3	40	16	CPHX 09T3..	219799 4 (15IP; 3.8 Nm)
52/7	eShop	3	40	22	CPHX 09T3..	219799 4 (15IP; 3.8 Nm)
66/8	eShop	3	50	27	CPHX 09T3..	219799 4 (15IP; 3.8 Nm)

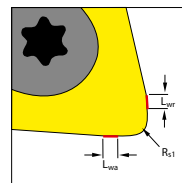
Garant Milling inserts for precision finishing mills No. 212534 /212538 /212542

- Inserts with improved wiper geometry for **more efficient machine processes in tool and die manufacture.**
- Extreme **time saving** available due to large stepover and high feed rate per tooth.
- Milling inserts with **radial** and **axial** wiper geometry.

Concentricity ± 0.020 mm.

Recommendation: For pure face milling operations, reduce V_c by 30%.

Note: Standard application values for a_e 0.2 mm.
 L_{wa} represents the axial wiper length.
 L_{wr} represents the radial wiper length.



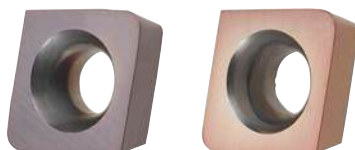
Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si										TOOLOX® 33 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	GGG					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	K					
HB4015				400	380	360	340	320	200				250	200	320	300	320					
HB7705								320	200	180	160						300					

Milling inserts CPHX0602..



Type			ST1400	HART		L_{wa} mm	L_{wr} mm	R_1 mm	 < 1400 N f_z mm	 < 65 HRC f_z mm
21A 21 2552	CPHX 060205 ER	HB4015	eShop	—	10	1	1.5	0.5	0.25	—
21A 21 2554	CPHX 060210 ER	HB4015	eShop	—	10	1	1.5	1	0.25	—
21A 21 2558		HB7705	—	eShop	10	0.5	0.8	1	—	0.15

Milling inserts CPHX09T3..



Type			ST1400	HART		L_{wa} mm	L_{wr} mm	R_1 mm	 < 1400 N f_z mm	 < 65 HRC f_z mm
21A 21 2572	CPHX 09T305 ER	HB4015	eShop	—	10	1	2	0.5	0.25	—
21A 21 2574	CPHX 09T310 ER	HB4015	eShop	—	10	1	2	1	0.25	—
21A 21 2578		HB7705	—	eShop	10	0.5	0.8	1	—	0.15



Garant Precision copy mill

Exactly accurate insert bedding due to optimised design of insert and insert seat tolerances.
Highest interchange accuracy guaranteed: ± 0.015 mm.

Size 8 – Without through-coolant feed.

21 2620 – Without through-coolant feed.

Application: General use for finishing and semi-finishing operations.

21 2590/2592 – **Solid carbide** – for large depths of cut and to minimise vibration.

21 2601–2620 – **Steel** – for general use in machining drop-forgings, and in tool and mould making.

Note: Calculate the speed based on the effective $\varnothing D_w$.

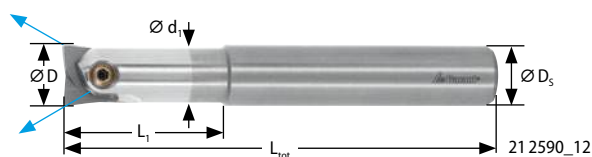
Size 8 – Use GARANT torque screwdriver TQ No. **211750 size 0.9** with bit No. **674252 size 7IP**.

Size 10 – Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

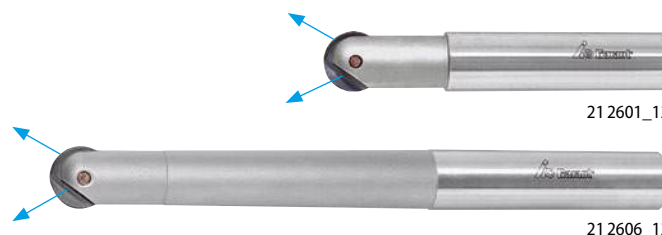
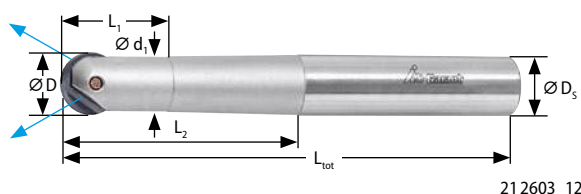
Size 12 – Use GARANT torque screwdriver TQ No. **211750 size 2.2** with bit No. **674252 size 10IP**.

Size 16 – Use GARANT torque screwdriver TQ No. **211750 size 3.0** with bit No. **674252 size 15IP**.

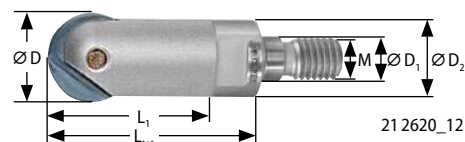
Size 20 – Use GARANT torque screwdriver TQ No. **211750 size 5.0** with bit No. **674252 size 20IP**.



$\varnothing D$	210	21 2590	210	21 2592	L_1		L_{tot}		$\varnothing d_1$	$\varnothing D_5$ h6	Insert screw
		Solid carbide copy mill									
		long Plain shank		extra long Plain shank	21 2590	21 2592	21 2590	21 2592			
mm					mm	mm	mm	mm	mm	mm	
8		eShop		eShop	25	40	100	150	7.2	8	219870 (7IP; 0.9 Nm)
10		eShop		eShop	35	50	120	150	8.8	10	219871 (8IP; 1.2 Nm)
12		eShop		eShop	35	50	120	160	10.4	12	219872 (10IP; 2.2 Nm)
16		eShop		eShop	40	55	140	175	14	16	219873 (15IP; 3.0 Nm)
20		eShop		eShop	50	75	140	190	17.5	20	219874 (20IP; 5.0 Nm)



$\varnothing D$	210	21 2601	210	21 2603	210	21 2606	L_1		L_2		L_{tot}			$\varnothing d_1$	$\varnothing D_5$ h6	Insert screw
		short Plain shank		long Plain shank		extra long Plain shank	21 2601	21 2603 21 2606	21 2603	21 2606	21 2601	21 2603	21 2606			
mm							mm	mm	mm	mm	mm	mm	mm	mm	mm	
8		eShop		eShop		–	32	18.5	53	–	92	110	–	7.2	12	219870 (7IP; 0.9 Nm)
10		eShop		eShop		eShop	32	21	53	75	92	110	132	8	12	219871 (8IP; 1.2 Nm)
12		eShop		eShop		eShop	32	22	53	85	92	110	145	10	12	219872 (10IP; 2.2 Nm)
16		eShop		eShop		eShop	32	28	63	100	92	123	166	14	16	219873 (15IP; 3.0 Nm)
20		eShop		eShop		eShop	38	34	75	115	104	141	191	17	20	219874 (20IP; 5.0 Nm)
25		eShop		–		–	45	–	–	–	121	–	–	22	25	219875 (25IP; 6.0 Nm)
32		eShop		–		–	100	–	–	–	186	–	–	27	32	219876 (30IP; 6.0 Nm)



$\varnothing D$	210	21 2620	$\varnothing D_1$ h6	L_{tot}	$\varnothing D_2$	L_1	Mounting thread M	Insert screw
		Copy mill						
		with threaded shank						
mm			mm	mm	mm	mm		
8		eShop	5.5	23	9.5	13	M5	219870 (7IP; 0.9 Nm)
10		eShop	5.5	23	9.5	23	M5	219871 (8IP; 1.2 Nm)
12		eShop	8.5	25	13.5	16.5	M8	219872 (10IP; 2.2 Nm)
16		eShop	8.5	28	13.5	28	M8	219873 (15IP; 3.0 Nm)
20		eShop	10.5	28	18.5	28	M10	219874 (20IP; 5.0 Nm)
25		eShop	12.5	35	21	35	M12	219875 (25IP; 6.0 Nm)
32		eShop	17	45	30	45	M16	219876 (30IP; 6.0 Nm)

Garant Precision milling inserts for copy mills No. 212590 – 212620

Detailed application values can be found in the GARANT machining handbook No. 110020.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si												INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K							
HU7810 / HU7830	1400	700	500													60								
HB7520				360	300	240	180	120						180	160		240	●		●		●	●	●
HB7530				200	180	160	140	120						140	120		160	●		●		●	●	●
HB7705									280	260	200	160	140	180	160		240			●		●	●	●
HB7935														180	160	60				●		●	●	●

- Maximum concentricity and interchange accuracy:
±0.015 mm.



Type	ALU	ST1400	HART	TI		Alu f _z mm	 < 1400 N f _z mm	 < 60 HRC f _z mm	Ti > 850 N f _z mm
21A 21 2630	eShop	eShop	–	eShop	10	0.15	0.15	–	0.15
21A 21 2640	eShop	eShop	–	eShop	10	0.2	0.2	–	0.2
21A 21 2650	eShop	eShop	eShop	eShop	10	0.2	0.2	0.15	0.2
21A 21 2660	eShop	eShop	eShop	eShop	10	0.25	0.28	0.2	0.25
21A 21 2665	–	eShop	–	–	10	–	0.25	–	–
21A 21 2670	eShop	eShop	eShop	eShop	10	0.25	0.28	0.2	0.25
21A 21 2675	–	eShop	–	–	10	–	0.25	–	–
21A 21 2680	eShop	eShop	eShop	eShop	10	0.3	0.33	0.25	0.3
21A 21 2685	–	eShop	–	–	10	–	0.3	–	–
21A 21 2690	eShop	eShop	–	eShop	5	0.35	0.36	–	0.35
21A 21 2695	–	eShop	–	–	5	–	0.35	–	–
Type	HU7810	HB7520	HB7705	HB7935					

- Maximum concentricity and interchange accuracy:
±0.015 mm.

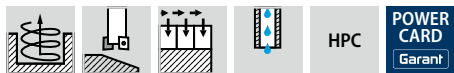


Type	ALU	ST1400	HART		Corner radius Rmm	Alu f _z mm	 < 1400 N f _z mm	 < 60 HRC f _z mm
21A 21 2705	eShop	eShop	–	10	0.5	0.15	0.15	–
21A 21 2708	eShop	eShop	–	10	1	0.15	0.15	–
21A 21 2711	eShop	eShop	–	10	0.5	0.2	0.2	–
21A 21 2714	eShop	eShop	–	10	1	0.2	0.2	–
21A 21 2717	eShop	eShop	eShop	10	1	0.25	0.25	0.2
21A 21 2721	eShop	eShop	–	10	2	0.25	0.25	–
21A 21 2724	eShop	eShop	eShop	10	1	0.3	0.3	0.2
21A 21 2727	eShop	eShop	–	10	3	0.3	0.3	–
21A 21 2731	eShop	eShop	eShop	10	1	0.35	0.35	0.25
21A 21 2734	eShop	eShop	–	10	4	0.35	0.35	–
Type	HU7810	HB7520	HB7705					

- Radius, concentricity: ±0.015 mm.
■ Interchange accuracy from insert to insert: ±0.025 mm.



Type	ALU	ST1400		a _p max mm	Programming radius at a _p max mm	Alu f _z mm	 < 1400 N f _z mm
21A 21 2746	eShop	eShop	10	0.4	1	0.3	0.4
21A 21 2749	eShop	eShop	10	0.5	1.4	0.4	0.5
21A 21 2752	eShop	eShop	10	0.6	1.4	0.5	0.6
21A 21 2756	eShop	eShop	10	0.8	1.6	0.6	0.8
Type	HU7830	HB7530					



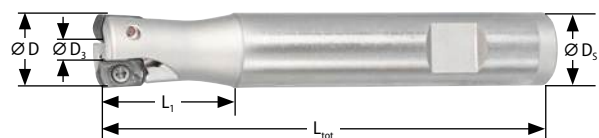
Garant GARANT Power Q Mini high feed rate indexable milling cutter for ANG10T308

High feed rate milling system for **smaller machining diameters** and **greater operating depths**. Particularly **effective due to the large number of cutting edges**.

Spare part: Pack of insert screws No. 269028 18 (7IP; 1.2Nm).

Note: Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 7IP**.

21 3056 – When working with extensions, always use internal cooling.



21 3052_16/2

Ø D / number of effective cutting edges Z	210 21 3052 GARANT Power Q Mini high feed rate indexable milling cutter	Ø D ₃	L ₁	L _{tot}	Ø D ₅ h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
mm	Weldon shank	mm	mm	mm	mm	mm	mm	mm	degrees	mm
16/2	eShop	10	30	100	16	26	30	1	2.39	8.4
20/3	eShop	14	50	130	20	34	38	1	1.62	12.4
25/4	eShop	19	60	140	25	44	48	1	1.15	17.4
32/5	eShop	26	70	150	32	58	62	1	0.82	24.4



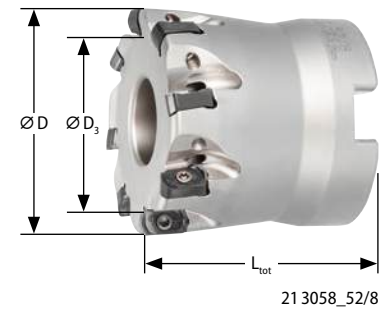
21 3054_16/2L

Ø D / number of effective cutting edges Z	210 21 3054 GARANT Power Q Mini high feed rate indexable milling cutter	Ø D ₃	L ₁	L _{tot}	Ø D ₅ h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
mm	Plain shank	mm	mm	mm	mm	mm	mm	mm	degrees	mm
16/2	eShop	10	30	100	16	26	30	1	2.39	8.4
16/2L	eShop	10	50	150	16	26	30	1	2.39	8.4
20/3	eShop	14	50	130	20	34	38	1	1.62	12.4
20/3L	eShop	14	80	160	20	34	38	1	1.62	12.4
25/4	eShop	19	100	180	25	44	48	1	1.15	17.4
32/5	eShop	26	120	200	32	58	62	1	0.82	24.4



21 3056_20/3

Ø D / number of effective cutting edges Z	210 21 3056 GARANT Power Q Mini high feed rate indexable milling cutter	Ø D ₁ h6	Ø D ₂	Ø D ₃	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
mm	with threaded shank	mm	mm	mm	mm		mm	mm	mm	degrees	mm
16/2	eShop	8.5	13	10	25	M8	26	30	1	2.39	8.4
20/3	eShop	10.5	18	14	30	M10	34	38	1	1.62	12.4
22/3	eShop	10.5	18	16	30	M10	38	42	1	1.39	14.4
25/4	eShop	12.5	21	19	35	M12	44	48	1	1.15	17.4
32/5	eShop	17	29	26	40	M16	58	62	1	0.82	24.4
35/5	eShop	17	29	29	40	M16	64	68	1	0.73	27.4
42/5	eShop	17	29	36	40	M16	78	82	1	0.58	34.4
42/7	eShop	17	29	36	40	M16	78	82	1	0.58	34.4



Ø D / number of effective cutting edges Z	210 21 3058 GARANT Power Q Mini high feed rate indexable milling cutter	Ø D ₃	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
mm	with bore	mm	mm	mm	mm	mm	mm	degrees	mm
40/5	eShop	34	40	16	74	78	1	0.62	32.4
40/7	eShop	34	40	16	74	78	1	0.62	32.4
42/7	eShop	36	40	16	78	82	1	0.58	34.4
50/5	eShop	44	50	22	94	98	1	0.47	42.4
50/8	eShop	44	50	22	94	98	1	0.47	42.4
52/8	eShop	46	50	22	98	102	1	0.45	44.4
63/7	eShop	57	40	22	120	124	1	0.36	55.4
66/8	eShop	60	40	22	126	130	1	0.34	58.4

Garant

GARANT Power Q Mini milling inserts for high feed rate indexable milling cutter No. 213052 to 213058

Double-sided 2-edge inserts. High-performance substrates and innovative cutter geometries guarantee the best possible production results.

Note: Standard application values for $a_e = 0.5 \dots 1 \times D/a_{p \max}$

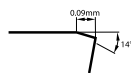
Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K			
21 3064				330	280	240															
21 3066					260	240	220	180													
21 3068									80	50	35						355				
21 3070													180	150							
21 3072															50						
21 3075					260	220	200	160					140	120							



21 3064_ST900



21 3066_ST1400



21 3068_HART



21 3070_INOX

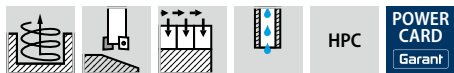


21 3072_TI



21 3075_UNI

Type			ST900	ST1400	HART	INOX	TI	UNI	recommended cutting depth a _{p max}	maximum cut- ting depth a _{p max}	Programming radius at a _{p max}
									mm	mm	mm
21A 21 3064	ANGX 10T308ZEER	HB9640	eShop	—	—	—	—	—	10	0.8	1.6
21A 21 3066		HB9540	—	eShop	—	—	—	—	10	0.8	1.6
21A 21 3068	ANGX 10T308ZESR	HB9715	—	—	eShop	—	—	—	10	0.4	1.6
21A 21 3070		HB9740	—	—	—	eShop	—	—	10	0.8	1.6
21A 21 3072	ANGX 10T308ZEER	HB9745	—	—	—	—	eShop	—	10	0.6	1.6
21A 21 3075		HB9540	—	—	—	—	—	eShop	10	0.8	1.6
f _z			mm	0.9	0.9	0.5	0.8	0.5	—		

**Garant**

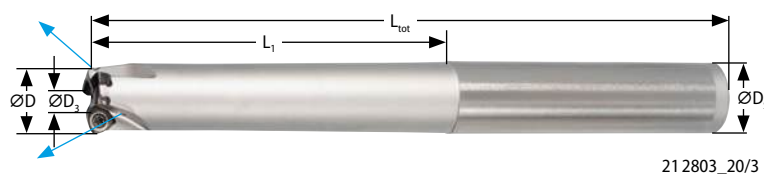
GARANT Power Q high feed rate indexable milling cutter for XOM.060310 / XDM.090416 / XDM.120516

GARANT Power Q high feed rate indexable milling cutter for XOM.060310

Spare part: Pack of insert screws No. 219799 1 (8IP; 1.2Nm).

Note: Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

21 2804 – When working with extensions, always use internal cooling.



21 2803_20/3



21 2804_20/3

Ø D / number of effective cutting edges Z	210	21 2802	210	21 2803	Ø D ₃	L ₁	L _{tot}	Ø D ₃ h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		GARANT Power Q high feed rate indexable milling cutter				21 2802	21 2803	21 2802	21 2803				
mm		Weld on shank		Plain shank	mm	mm	mm	mm	mm	mm	mm	degrees	mm
16/2		eShop		eShop	8	30	70	80	150	16	24	3.73	6.13
18/2		eShop		eShop	10	30	20	80	150	16	28	2.82	8.13
20/3		eShop		eShop	12	35	100	85	180	20	38	2.26	10.13
22/3		eShop		eShop	14	35	30	85	180	20	42	1.89	12.13

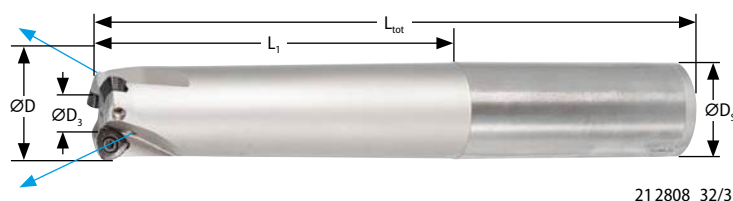
Ø D / number of effective cutting edges Z	210	21 2804	Number of cutting edges Z	Ø D ₁ h6	Ø D ₂	Ø D ₃	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		GARANT Power Q high feed rate indexable milling cutter											
mm		with threaded shank		mm	mm	mm	mm		mm	mm	mm	degrees	mm
16/2		eShop	2	8.5	13	8	25	M8	24	30	0.3	3.73	6.13
18/2		eShop	2	8.5	13	10	25	M8	28	34	0.3	2.82	8.13
20/3		eShop	3	10.5	18	12	28	M10	32	38	0.3	2.26	10.13
22/3		eShop	3	10.5	18	14	28	M10	36	42	0.3	1.89	12.13
25/4		eShop	4	12.5	21	17	36	M12	42	48	0.3	1.51	15.13

GARANT Power Q high feed rate indexable milling cutter for XDM.090416

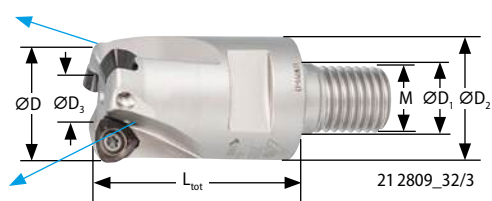
Spare part: Pack of insert screws No. 219799 2 (10IP; 2.2Nm).

Note: Use GARANT torque screwdriver TQ No. **211750 size 2.2** with bit No. **674252 size 10IP**.

21 2809 – When working with extensions, always use internal cooling.



21 2808_32/3

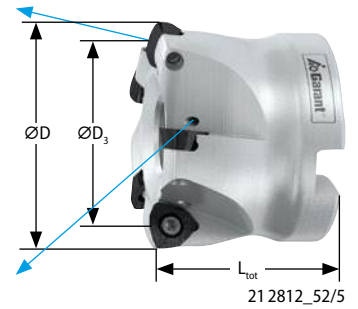


21 2809_32/3

Ø D / number of effective cutting edges Z	210	21 2807	210	21 2808	Ø D ₃	L ₁	L _{tot}	Ø D ₃ h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		GARANT Power Q high feed rate indexable milling cutter				21 2807	21 2808	21 2807	21 2808				
mm		Weld on shank		Plain shank	mm	mm	mm	mm	mm	mm	mm	degrees	mm
25/2		eShop		eShop	13	39	120	95	200	25	38	3.29	10.43
28/2		eShop		eShop	16	39	40	95	200	25	44	2.56	13.43
30/3		eShop		eShop	18	40	120	100	200	32	48	2.23	15.43
32/3		eShop		eShop	20	40	120	100	200	32	52	1.97	17.43
35/3		eShop		eShop	23	40	50	100	200	32	58	1.68	20.43
40/4		eShop		eShop	28	50	50	110	250	32	68	1.35	25.43

Ø D / number of effective cutting edges Z	210	21 2809	Number of cutting edges Z	Ø D ₁ h6	Ø D ₂	Ø D ₃	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		GARANT Power Q high feed rate indexable milling cutter											
mm		with threaded shank		mm	mm	mm	mm		mm	mm	mm	degrees	mm
25/2		eShop	2	12.5	21	13	36	M12	38	48	1	3.29	10.43
28/2		eShop	2	12.5	21	16	36	M12	44	54	1	2.56	13.43
30/3		eShop	3	17	29	18	47	M16	48	58	1	2.23	15.43
32/3		eShop	3	17	29	20	47	M16	52	62	1	1.97	17.43
35/3		eShop	3	17	29	23	47	M16	58	68	1	1.68	20.43
40/4		eShop	4	17	29	28	47	M16	68	78	1	1.35	25.43
42/4		eShop	4	17	29	30	47	M16	72	82	1	1.25	27.43

$\varnothing D$ / number of effective cutting edges Z	210 21 2812 GARANT Power Q high feed rate indexable milling cutter	$\varnothing D_3$	L_{tot}	Mounting bore $\varnothing$	Circular interpolation milling $\varnothing D_{min}$	Circular interpolation milling $\varnothing D_{max}$	Circular interpolation milling a_p	Ramping angle α_{max}	Ramping length L for α_{max}
	with bore	mm	mm	mm	mm	mm	mm	degrees	mm
50/5	eShop	38	40	22	88	98	1	0.97	35.43
52/5	eShop	40	40	22	92	102	1	0.92	37.43



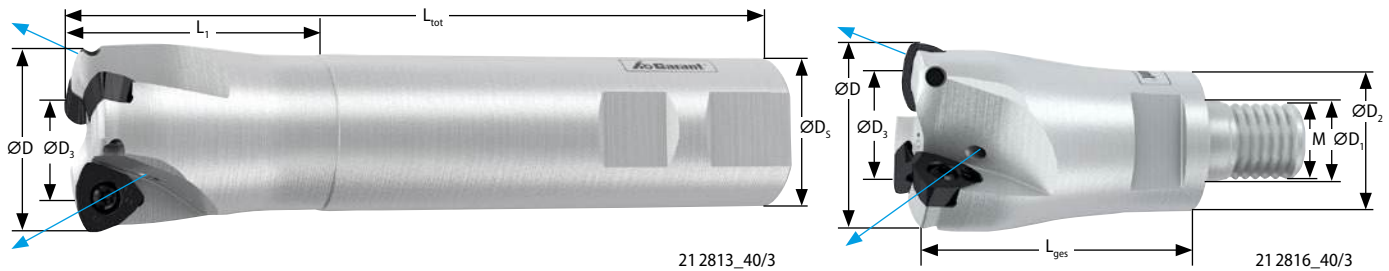
21 2812_52/5

GARANT Power Q high feed rate indexable milling cutter for XDM.120516

Spare part: Pack of insert screws No. 219812 (15IP; 5.0Nm).

Note: Use GARANT torque screwdriver TQ No. **211750 size 5.0** with bit No. **674252 size 15IP**.

21 2816 – When working with extensions, always use internal cooling.

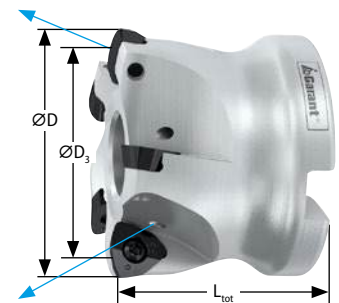


21 2813_40/3

21 2816_40/3

Ø D / number of effective cutting edges Z	210	21 2813	210	21 2814	Ø D ₃	L ₁		L _{tot}		Ø D _{h6}	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
	GARANT Power Q high feed rate indexable milling cutter					21 2813	21 2814	21 2813	21 2814						
	mm	Weldon shank	Plain shank	mm		mm	mm	mm	mm						
30/2		eShop		eShop	14	40	120	100	200	32	44	58	1.5	4.42	10.34
32/2		eShop		eShop	16	40	120	100	200	32	48	62	1.5	3.71	12.34
35/2		eShop		eShop	19	40	50	100	200	32	54	68	1.5	2.99	15.34
40/3		eShop		eShop	24	50	50	110	250	32	64	78	1.5	2.25	20.34

$\varnothing D$ / number of effective cutting edges Z	210 21 2816 GARANT Power Q high feed rate indexable milling cutter	Number of cutting edges Z	$\varnothing D_1$ h6	$\varnothing D_2$	$\varnothing D_3$	L_{tot}	Mounting thread M	Circular interpolation milling $\varnothing D_{min}$	Circular interpolation milling $\varnothing D_{max}$	Circular interpolation milling a_p	Ramping angle α_{max}	Ramping length L for α_{max}
mm	with threaded shank		mm	mm	mm	mm		mm	mm	mm	degrees	mm
30/2	eShop	2	17	29	14	47	M16	44	58	1.5	4.42	10.34
32/2	eShop	2	17	29	16	47	M16	48	62	1.5	3.71	12.34
35/2	eShop	2	17	29	19	47	M16	54	68	1.5	2.99	15.34
40/3	eShop	3	17	29	24	60	M16	64	78	1.5	2.25	20.34
42/3	eShop	3	17	29	26	60	M16	68	82	1.5	2.05	22.34



21 2817_63/5

$\varnothing D$ / number of effective cutting edges Z	210 21 2817 GARANT Power Q high feed rate indexable milling cutter	$\varnothing D_3$	L_{tot}	Mounting bore $\varnothing$	Circular interpolation milling $\varnothing D_{min}$	Circular interpolation milling $\varnothing D_{max}$	Circular interpolation milling a_p	Ramping angle α_{max}	Ramping length L for α_{max}
mm	with bore	mm	mm	mm	mm	mm	mm	degrees	mm
50/3	eShop	34	40	22	84	98	1.5	1.51	30.34
50/4	eShop	34	40	22	84	98	1.5	1.51	30.34
52/3	eShop	36	40	22	88	102	1.5	1.42	32.34
52/4	eShop	36	40	22	88	102	1.5	1.42	32.34
63/5	eShop	47	50	27	110	124	1.5	1.06	43.34
66/5	eShop	50	50	27	116	130	1.5	0.99	46.34
80/6	eShop	64	50	32	144	158	1.5	0.76	60.34
100/7	eShop	84	63	32	184	198	1.5	0.57	80.34

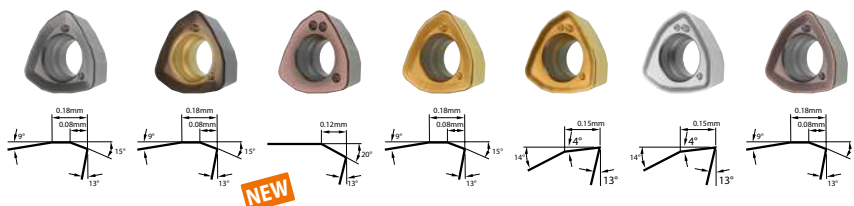
Garant

GARANT Power Q milling inserts for high feed rate indexable milling cutter No. 212802 to 212817

Note: Standard application values for $a_e = 0.5 \dots 1 \times D / a_{p \max}$

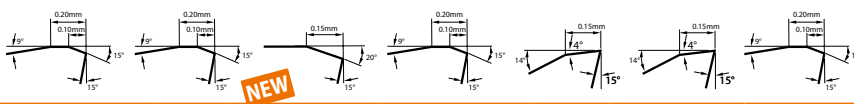
Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si									INOX	INOX	Ti	Inconel*	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	S	K					
21 2819/2860/2887				330	280	240																
21 2826/2868/2890							240	220														
21 2830/2877/2891									110	80	50						200					
21 2836/2879/2893													190	170								
21 2842/2881/2895													180	160	50							
21 2852/2883/2897																30						
21 2854/2885/2899				280	260	220	200	180					150	130				●				

Milling inserts XOM.060310



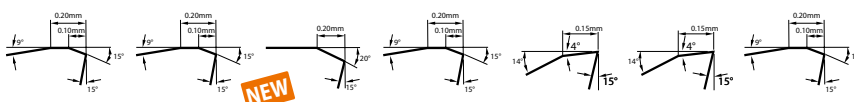
Type			ST900	ST1400	HART	INOX	TI	S	UNI		recommended cutting depth $a_{p \max}$ mm	maximum cutting depth $a_{p \max}$ mm	Programming radius at $a_{p \max}$ mm
21A 21 2819	XOMT060310ZZSR	HB4020	eShop	—	—	—	—	—	—	10	1	1	2
21A 21 2826	XOMT060310ZZSR	HB4030	—	eShop	—	—	—	—	—	10	1	1	2
21A 21 2830	XOMW060310ZZSR	HB4715	—	—	eShop	—	—	—	—	10	0.5	1	2
21A 21 2836	XOMT060310ZZSR	HB4130	—	—	—	eShop	—	—	—	10	0.9	1	2
21A 21 2842	XOMT060310ZZSR	HB4430	—	—	—	—	eShop	—	—	10	0.6	1	2
21A 21 2852	XOMT060310ZZER	HB4420	—	—	—	—	—	eShop	—	10	0.6	1	2
21A 21 2854	XOMT060310ZZER	HB415	—	—	—	—	—	—	eShop	10	1	1	2
f_z	mm		0.8	0.8	0.4	0.8	0.5	0.4	—				

Milling inserts XDM.090416

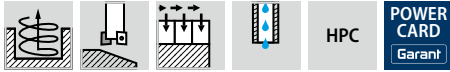


Type			ST900	ST1400	HART	INOX	TI	S	UNI		recommended cutting depth $a_{p \max}$ mm	maximum cutting depth $a_{p \max}$ mm	Programming radius at $a_{p \max}$ mm
21A 21 2860	XDMT090416ZDSR	HB4020	eShop	—	—	—	—	—	—	10	1.3	1.5	3
21A 21 2868	XDMT090416ZDSR	HB4030	—	eShop	—	—	—	—	—	10	1.2	1.5	3
21A 21 2877	XDMW090416ZDSR	HB4715	—	—	eShop	—	—	—	—	10	0.7	1.5	3
21A 21 2879	XDMT090416ZDSR	HB4130	—	—	—	eShop	—	—	—	10	1.1	1.5	3
21A 21 2881	XDMT090416ZDER	HB4430	—	—	—	—	eShop	—	—	10	0.7	1.5	3
21A 21 2883	XDMT090416ZDER	HB4420	—	—	—	—	—	eShop	—	10	0.7	1.5	3
21A 21 2885	XDMT090416ZDSR	HB415	—	—	—	—	—	—	eShop	10	1.2	1.5	3
f_z	mm		1.1	1.1	0.8	1.1	0.6	0.45	—				

Milling inserts XDM.120516



Type			ST900	ST1400	HART	INOX	TI	S	UNI		recommended cutting depth $a_{p \max}$ mm	maximum cutting depth $a_{p \max}$ mm	Programming radius at $a_{p \max}$ mm
21A 21 2887	XDMT120516ZDSR	HB4020	eShop	—	—	—	—	—	—	10	1.5	2	3
21A 21 2890	XDMT120516ZDSR	HB4030	—	eShop	—	—	—	—	—	10	1.3	2	3
21A 21 2891	XDMW120516ZDSR	HB4715	—	—	eShop	—	—	—	—	10	0.8	2	3
21A 21 2893	XDMT120516ZDSR	HB4130	—	—	—	eShop	—	—	—	10	1.2	2	3
21A 21 2895	XDMT120516ZDER	HB4430	—	—	—	—	eShop	—	—	10	0.9	2	3
21A 21 2897	XDMT120516ZDER	HB4420	—	—	—	—	—	eShop	—	10	0.9	2	3
21A 21 2899	XDMT120516ZDSR	HB415	—	—	—	—	—	—	eShop	10	1.3	2	3
f_z	mm		1.2	1.2	0.9	1.2	0.8	0.5	—				



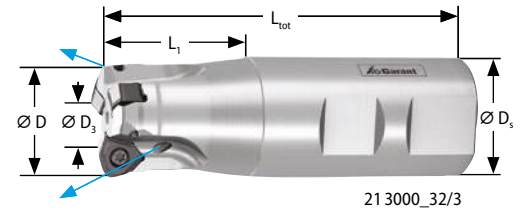
Garant GARANT Power Q Double high feed rate indexable milling cutter for XOMU094812 | XOMU146715

Tool system with **extremely stable embedding for the inserts** for working to high process reliability.
Tool geometries to reduce the cutting forces contribute significantly to **reducing the load on the headstock**.

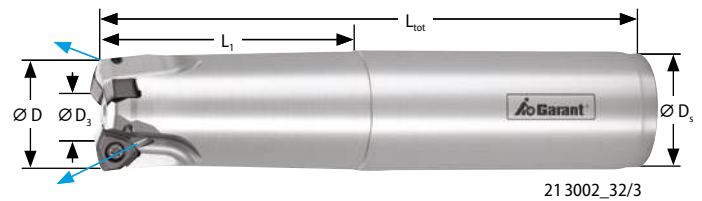
GARANT Power Q Double high feed rate indexable milling cutter for XOMU094812

Spare part: Pack of insert screws No. 219799 7 (10IP; 2.8Nm).

Note: Use GARANT torque screwdriver TQ No. **211750 size 2.8** with bit No. **674252 size 10IP**.
21 3004 – When working with extensions, always use internal cooling.



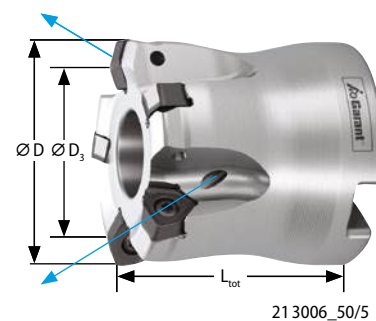
Ø D / number of effective cutting edges Z	210	21 3000	Ø D ₃	L ₁	L _{tot}	Ø D ₅ h ₆	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for a _{max}
mm		GARANT Power Q Double high feed rate indexable milling cutter	mm	mm	mm	mm	mm	mm	mm	degrees	mm
		Weldon shank									
25/2		eShop	15	39	95	25	40	48	1.2	2.74	12.55
30/3		eShop	20	40	100	32	50	58	1.2	1.96	17.55
32/3		eShop	22	40	100	32	54	62	1.2	1.76	19.55
40/4		eShop	30	50	110	32	70	78	1.2	1.25	27.55



Ø D / number of effective cutting edges Z	210	21 3002	Ø D ₃	L ₁	L _{tot}	Ø D ₅ h ₆	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for a _{max}
mm		GARANT Power Q Double high feed rate indexable milling cutter	mm	mm	mm	mm	mm	mm	mm	degrees	mm
		Plain shank									
25/2		eShop	15	70	150	25	40	48	1.2	2.74	12.55
30/3		eShop	20	70	150	32	50	58	1.2	1.96	17.55
32/3		eShop	22	70	150	32	54	62	1.2	1.76	19.55
35/4		eShop	25	70	150	32	60	68	1.2	1.52	22.55
40/4		eShop	30	120	200	32	70	78	1.2	1.25	27.55



Ø D / number of effective cutting edges Z	210	21 3004	Ø D ₁ h ₆	Ø D ₂	Ø D ₃	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for a _{max}
mm		GARANT Power Q Double high feed rate indexable milling cutter	mm	mm	mm	mm		mm	mm	mm	degrees	mm
		with threaded shank										
25/2		eShop	12.5	21	15	36	M12	40	48	1.2	2.74	12.55
30/3		eShop	17	29	20	47	M16	50	58	1.2	1.96	17.55
32/3		eShop	17	29	22	47	M16	54	62	1.2	1.76	19.55
35/4		eShop	17	29	25	47	M16	60	68	1.2	1.52	22.55
40/4		eShop	17	29	30	47	M16	70	78	1.2	1.25	27.55
42/4		eShop	17	29	32	47	M16	74	82	1.2	1.16	29.55

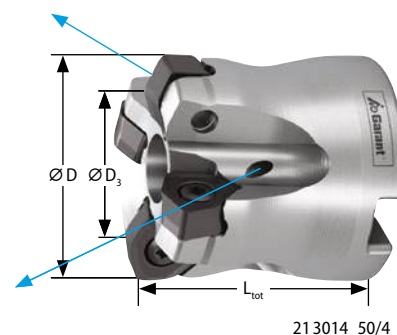


Ø D / number of effective cutting edges Z	210	21 3006	Ø D ₃	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
mm		GARANT Power Q Double high feed rate indexable milling cutter	mm	mm	mm	mm	mm	mm	degrees	mm
		with bore								
50/5		eShop	40	50	22	90	98	1.2	0.92	37.55
52/5		eShop	42	50	22	94	102	1.2	0.87	39.55
63/6		eShop	53	50	27	116	124	1.2	0.68	50.55
66/7		eShop	56	50	27	122	130	1.2	0.64	53.55

GARANT Power Q Double high feed rate indexable milling cutter for XOMU146715

Spare part: Pack of insert screws No. 219799 8 (20IP; 5.7Nm).

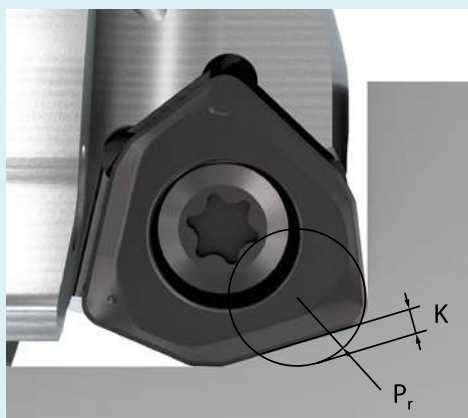
Note: Use GARANT torque screwdriver TQ No. 211750 size 5.7 with bit No. 674252 size 20IP.



Ø D / number of effective cutting edges Z	210	21 3014	Ø D ₃	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
mm		GARANT Power Q Double high feed rate indexable milling cutter	mm	mm	mm	mm	mm	mm	degrees	mm
		with bore								
50/4		eShop	34	50	22	84	98	2	1.47	31.07
52/4		eShop	36	50	22	88	102	2	1.39	33.07
63/5		eShop	47	50	27	110	124	2	1.04	44.07
66/5		eShop	50	50	27	116	130	2	0.97	47.07
80/6		eShop	64	50	32	144	158	2	0.75	61.07
100/8		eShop	84	63	32	184	198	2	0.57	81.07

Garant

Application notes for GARANT Power Q Double



Indexable insert	Programming radius P _r (mm)	Unmachined area K (mm)
XOMU094812 ZZER	2.0	0.91
XOMU146715 ZZER	3.0	1.41

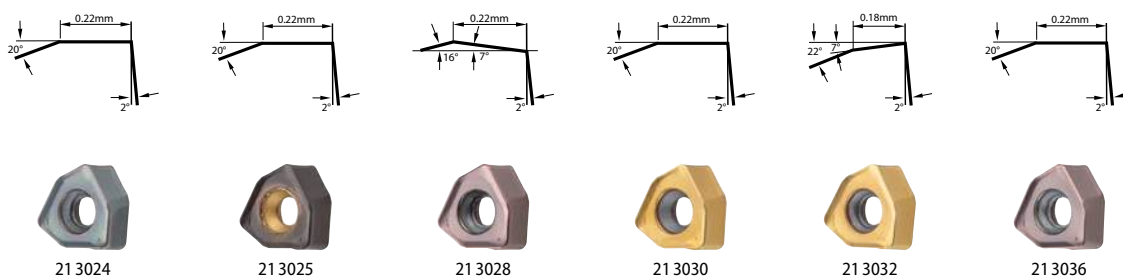
Garant **GARANT Power Q Double milling inserts**
for high feed rate indexable milling cutter No. 213000 to 213014

Innovative indexable insert concept with **double-sided** indexable inserts with 3 cutting edges (2x3 cutting edges).
High-performance tool material for particularly high **cost-effectiveness**.

Note: Standard application values for $a_e = 0.5 \dots 1 \times D / a_{p \max}$

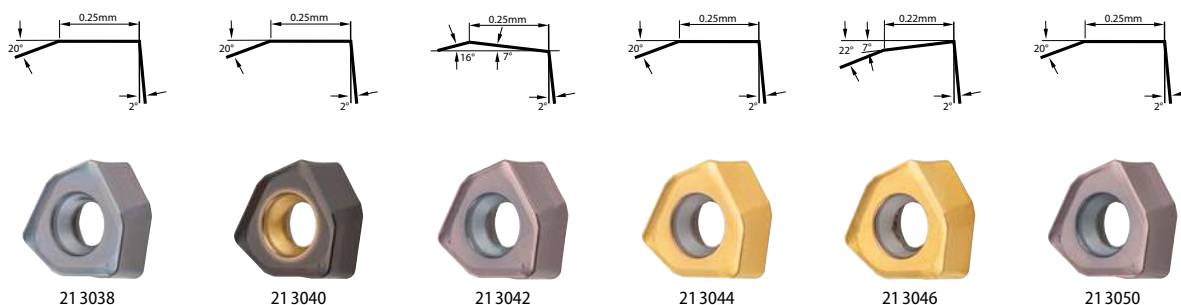
Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si										INOX	INOX	Ti	GG(G)	Uni					
	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K					
21 3024/3038				330	280	240																
21 3025/3040							240	220														
21 3028/3042									110	80	50						200					
21 3030/3044														190	170							
21 3032/3046														180	160	50						
21 3036/3050				280	260	220	200	180						150	130							

Milling inserts XOMU094812



Type			ST900	ST1400	HART	INOX	TI	UNI		recommended cutting depth $a_{p \max}$	maximum cutting depth $a_{p \max}$	Programming radius at $a_{p \max}$
										mm	mm	mm
21A	21 3024	XOMU094812ZZER	HB4020	eShop	—	—	—	—	10	1.2	1.5	2
21A	21 3025		HB4030	—	eShop	—	—	—	10	1	1.5	2
21A	21 3028		HB4715	—	—	eShop	—	—	10	0.6	1.5	2
21A	21 3030		HB4130	—	—	—	eShop	—	10	0.8	1.5	2
21A	21 3032		HB4430	—	—	—	—	eShop	10	0.8	1.5	2
21A	21 3036		HB415	—	—	—	—	—	eShop	10	1	1.5
f		mm	1.1	1.1	0.8	1.1	0.6	—				

Milling inserts XOMU146715



Type			ST900	ST1400	HART	INOX	TI	UNI		recommended cutting depth a _p max	maximum cutting depth a _p max	Programming radius at a _p max
										mm	mm	mm
21A	21 3038	XOMU146715ZZER	HB4020	eShop	—	—	—	—	10	1.5	3	3
21A	21 3040		HB4030	—	eShop	—	—	—	10	1.3	3	3
21A	21 3042		HB4715	—	—	eShop	—	—	10	0.8	3	3
21A	21 3044		HB4130	—	—	—	eShop	—	10	1	3	3
21A	21 3046		HB4430	—	—	—	—	eShop	10	0.8	3	3
21A	21 3050		HB415	—	—	—	—	—	eShop	10	1.3	3
f _i	mm		1.3	1.3	0.9	1.2	0.8	—				



Garant

FeedKing high feed rate indexable milling cutter HPC for XD.. 070308 / 09T308 / 120408

Dynamic cutting edge geometry for highest feed rates. Extremely smooth cutting due to **self-stabilising insert bedding**.

Optimised geometry for reduced cutting forces, thereby reducing the stress on the main spindle.

Advantage: Particularly cost-effective due to **exceptionally sturdy 4-edge** inserts.

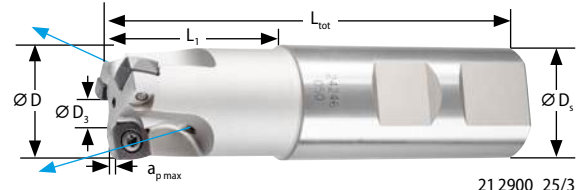
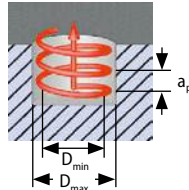
Note:

21 2905 – When working with extensions, always use internal cooling.

FeedKing high feed rate indexable milling cutter for XD.. 070308

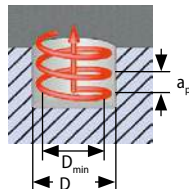
Note:

Use GARANT torque screwdriver TQ No. **211750** size **2.2** with bit No. **674252** size **9IP**.



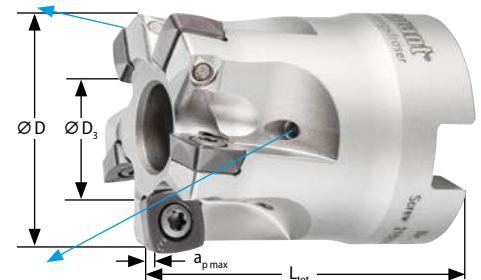
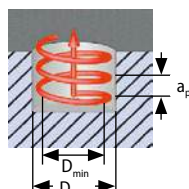
21 2900_25/3

Ø D / number of teeth Z	210 21 2900		210 21 2902		Ø D ₃	maximum cutting depth a _{p max}	L ₁	L _{tot}	Ø D ₅ h ₆	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
	FeedKing high feed rate indexable milling cutter															
	mm	Weldon shank	Plain shank	mm												
18/2	eShop	—	5	0.85	30	80	16	23	34	0.85	4.29	4	XD.. 070308	219810 (9IP; 2.2 Nm)		
18/2L	—	eShop	5	0.85	30	160	16	23	34	0.85	4.29	4	XD.. 070308	219810 (9IP; 2.2 Nm)		
20/2	eShop	—	7	0.85	35	85	20	27	38	0.85	2.86	6	XD.. 070308	219810 (9IP; 2.2 Nm)		
20/2L	—	eShop	7	0.85	35	160	18	27	38	0.85	2.86	6	XD.. 070308	219810 (9IP; 2.2 Nm)		
25/3	eShop	—	12	0.85	39	95	25	37	48	0.85	1.56	11	XD.. 070308	219810 (9IP; 2.2 Nm)		
25/3L	—	eShop	12	0.85	35	180	20	37	48	0.85	1.56	11	XD.. 070308	219810 (9IP; 2.2 Nm)		
35/5L	—	eShop	22	0.85	35	220	32	57	68	0.85	0.82	21	XD.. 070308	219810 (9IP; 2.2 Nm)		



21 2905_25/3

Ø D / number of teeth Z	210	21 2905	Ø D ₁ h ₆	Ø D ₂	Ø D ₃	maximum cutting depth a _{p max}	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
	FeedKing high feed rate indexable milling cutter														
mm	with threaded shank		mm	mm	mm	mm	mm		mm	mm	mm	degrees	mm		
18/2	eShop		10.5	17	5	0.85	30	M10	23	34	0.85	4.29	4	XD.. 070308	219810 (9IP; 2.2 Nm)
20/2	eShop		10.5	17.7	7	0.85	30	M10	27	38	0.85	2.86	6	XD.. 070308	219810 (9IP; 2.2 Nm)
25/3	eShop		12.5	20.7	12	0.85	35	M12	37	48	0.85	1.56	11	XD.. 070308	219810 (9IP; 2.2 Nm)
32/5	eShop		17	28.7	19	0.85	42	M16	51	62	0.85	0.95	18	XD.. 070308	219810 (9IP; 2.2 Nm)
35/5	eShop		17	28.7	22	0.85	42	M16	57	68	0.85	0.82	21	XD.. 070308	219810 (9IP; 2.2 Nm)
42/6	eShop		17	28.7	29	0.85	42	M16	71	82	0.85	0.61	28	XD.. 070308	219810 (9IP; 2.2 Nm)

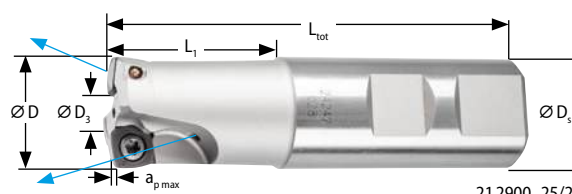
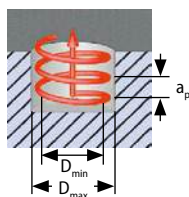


21 2910_32/5

Ø D / number of teeth Z	210	21 2910	Ø D ₃	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
	FeedKing high feed rate indexable milling cutter												
mm	with bore		mm	mm	mm	mm	mm	mm	mm	degrees	mm		
32/5	eShop		19	0.85	40	16	51	62	0.85	0.95	18	XD.. 070308	219810 (9IP; 2.2 Nm)
35/5	eShop		22	0.85	40	16	57	68	0.85	0.82	21	XD.. 070308	219810 (9IP; 2.2 Nm)
40/6	eShop		27	0.85	40	16	67	78	0.85	0.66	26	XD.. 070308	219810 (9IP; 2.2 Nm)
50/7	eShop		37	0.85	40	22	87	98	0.85	0.48	36	XD.. 070308	219810 (9IP; 2.2 Nm)
63/9	eShop		50	0.85	50	27	113	124	0.85	0.35	49	XD.. 070308	219810 (9IP; 2.2 Nm)

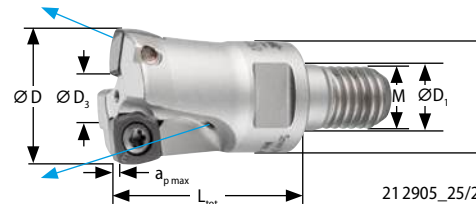
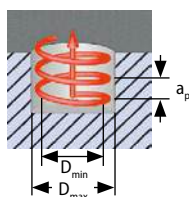
Feeding high feed rate indexable milling cutter for XD.. 09T308

Note: Use GARANT torque screwdriver TQ No. 211750 size 3.8 with bit No. 674252 size 15IP.



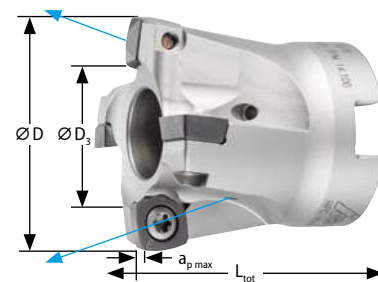
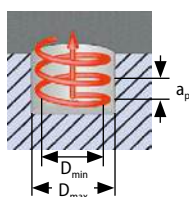
21 2900_25/2

$\varnothing D$ / number of teeth Z	210 21 2900 FeedKing high feed rate indexable milling cutter	$\varnothing D_3$	maximum cutting depth $a_{p \max}$	L_1	L_{tot}	$\varnothing D_5$ h6	Circular interpolation milling $\varnothing D_{\min}$	Circular interpolation milling $\varnothing D_{\max}$	Circular interpolation milling a_p	Ramping angle $\alpha_{\max}$	Ramping length L for $\alpha_{\max}$	suitable indexable insert	Set of insert screws
mm	Weldon shank	mm	mm	mm	mm	mm	mm	mm	mm	degrees	mm		
25/2	eShop	9	1.15	39	95	25	34	48	1.15	2.02	8.5	XD.. 09T308	219933 (15IP; 3.8 Nm)



21 2905_25/2

$\varnothing D$ / number of teeth Z	210 21 2905 FeedKing high feed rate indexable milling cutter	$\varnothing D_1$ h6	$\varnothing D_2$	$\varnothing D_3$	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting thread M	Circular interpolation milling $\varnothing D_{\min}$	Circular interpolation milling $\varnothing D_{\max}$	Circular interpolation milling a_p	Ramping angle $\alpha_{\max}$	Ramping length L for $\alpha_{\max}$	suitable indexable insert	Set of insert screws
mm	with threaded shank	mm	mm	mm	mm	mm		mm	mm	mm	degrees	mm		
25/2	eShop	12.5	20.7	9	1.15	35	M12	34	48	1.15	2.02	8.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
32/3	eShop	17	28.7	16	1.15	42	M16	48	62	1.15	1.11	15.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
35/3	eShop	17	28.7	19	1.15	42	M16	54	68	1.15	0.93	18.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
40/4	eShop	17	28.7	24	1.15	42	M16	64	78	1.15	0.73	23.5	XD.. 09T308	219933 (15IP; 3.8 Nm)

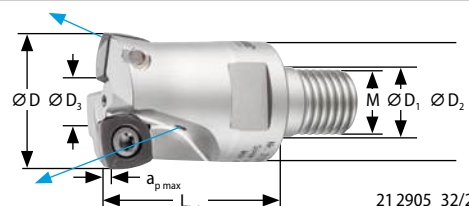
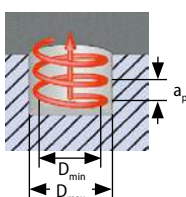


21 2910_40/4

$\varnothing D$ / number of teeth Z	210 21 2910 FeedKing high feed rate indexable milling cutter	$\varnothing D_3$	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore $\varnothing$	Circular interpolation milling $\varnothing D_{\min}$	Circular interpolation milling $\varnothing D_{\max}$	Circular interpolation milling a_p	Ramping angle $\alpha_{\max}$	Ramping length L for $\alpha_{\max}$	suitable indexable insert	Set of insert screws
mm	with bore	mm	mm	mm	mm	mm	mm	mm	degrees	mm		
35/3	eShop	19	1.15	40	16	54	68	1.15	0.93	18.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
40/4	eShop	24	1.15	40	16	64	78	1.15	0.73	23.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
42/4	eShop	26	1.15	40	16	68	82	1.15	0.67	25.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
50/5	eShop	34	1.15	40	22	84	98	1.15	0.51	33.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
52/5	eShop	36	1.15	40	22	88	102	1.15	0.48	35.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
63/6	eShop	47	1.15	50	27	110	124	1.15	0.37	46.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
66/6	eShop	50	1.15	50	27	116	130	1.15	0.35	49.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
80/7	eShop	64	1.15	50	32	144	158	1.15	0.27	63.5	XD.. 09T308	219933 (15IP; 3.8 Nm)
100/8	eShop	84	1.15	50	32	184	198	1.15	0.21	83.5	XD.. 09T308	219933 (15IP; 3.8 Nm)

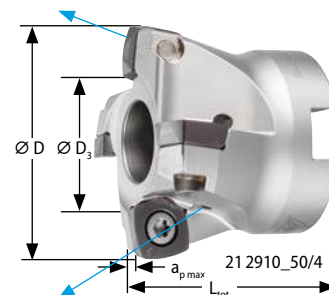
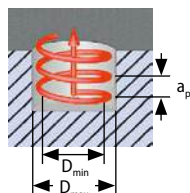
Feeding high feed rate indexable milling cutter for XD.. 120408

Note: Use GARANT torque screwdriver TQ No. 211750 size 5.7 with bit No. 674252 size 20IP.



21 2905_32/2

$\varnothing D$ / number of teeth Z	210 21 2905 FeedKing high feed rate indexable milling cutter	$\varnothing D_1$ h6	$\varnothing D_2$	$\varnothing D_3$	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting thread M	Circular interpolation milling $\varnothing D_{\min}$	Circular interpolation milling $\varnothing D_{\max}$	Circular interpolation milling a_p	Ramping angle $\alpha_{\max}$	Ramping length L for $\alpha_{\max}$	suitable indexable insert	Set of insert screws
mm	with threaded shank	mm	mm	mm	mm	mm		mm	mm	mm	degrees	mm		
32/2	eShop	17	28.7	11	1.8	42	M16	43	62	1.85	1.64	10.5	XD.. 120408	219800 (20IP; 5.7 Nm)
35/3S	eShop	17	28.7	14	1.8	42	M16	49	68	1.85	1.27	13.5	XD.. 120408	219800 (20IP; 5.7 Nm)
42/4	eShop	17	28.7	21	1.8	42	M16	63	82	1.85	0.84	20.5	XD.. 120408	219800 (20IP; 5.7 Nm)



Ø D / number of teeth Z	210	21 2910	Ø D ₃	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for a _{max}	suitable indexable insert	Set of insert screws
mm		with bore	mm	mm	mm	mm	mm	mm	mm	degrees	mm		
50/4		eShop	29	1.8	40	22	79	98	1.85	0.6	28.5	XD.. 120408	219800 (20IP; 5.7 Nm)
52/4		eShop	31	1.8	40	22	83	102	1.85	0.56	30.5	XD.. 120408	219800 (20IP; 5.7 Nm)
63/5		eShop	42	1.8	50	27	105	124	1.85	0.41	41.5	XD.. 120408	219800 (20IP; 5.7 Nm)
66/5		eShop	45	1.8	50	27	111	130	1.85	0.39	44.5	XD.. 120408	219800 (20IP; 5.7 Nm)
66/6S		eShop	45	1.8	50	27	111	130	1.85	0.39	44.5	XD.. 120408	219800 (20IP; 5.7 Nm)
80/6		eShop	59	1.8	50	32	139	158	1.85	0.29	58.5	XD.. 120408	219800 (20IP; 5.7 Nm)
100/7		eShop	79	1.8	50	32	179	198	1.85	0.22	78.5	XD.. 120408	219800 (20IP; 5.7 Nm)

Garant Milling inserts for FeedKing HPC high feed rate milling cutters No. 212900 – 212910

Note: Standard application values for $a_e = 0.5 \dots 1 \times D / a_{p \max}$

a _e / D	0.5 ... 1.0	0.3	0.1
Correction factor f _z	1	1.4	2.2

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	Y < 500 N	Y < 750 N	Y < 900 N	Y < 1100 N	Y < 1400 N	Y < 50 HRC	Y < 55 HRC	Y < 60 HRC	Y < 65 HRC	Y < 67 HRC	TOOLOX® 44 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K					
21 2921/2943/2966	1200	1500	1100																				
21 2923/2924/2946				320	270	230																	
2947/2968/2969							170	150															
21 2925/2950/2975																							
21 2928/2929/2951														140									
2952/2974/2978																							
21 2930/2955/2980									120	110	90	70	60	140									
21 2931/2953/2971							180	160															
21 2932/2933/2954									100	80	50												
2956/2977/2982																							
21 2934/2936/2959															150	110	45						
2961/2979/2984															150	110	45						
21 2937/2962/2987																							
21 2940/2963/2990																							
21 2941/2964/2991																							

Milling inserts XD..070308

Note:

21 2941 – Do not tighten insert screw
No. 219810 to more than 1.5 Nm!



Type	ALU	ST900	ST1400	HART	INOX	GGG		a _{p max} mm	f _z mm
21A 21 2921 XDLT 070308 ER	HU7810 eShop	–	–	–	–	–	10	0.85	0.65
21A 21 2923 XDLW 070308 SR	–	HB7530 eShop	–	–	–	–	10	0.85	0.72
21A 21 2924 XDPW 070308 SR	–	HB7530	–	–	–	–	10	0.85	0.72
21A 21 2925 XDLW 070308 TN	–	–	HB7720 eShop	–	–	–	10	0.85	0.65
21A 21 2931 XDLW 070308 SR	–	–	HB4025 eShop	–	–	–	10	0.85	0.65
21A 21 2928 XDLT 070308 ER	–	–	–	HB7720 eShop	–	–	10	0.85	0.36
21A 21 2929 XDPT 070308 ER	–	–	–	HB7720 eShop	–	–	10	0.85	0.36
21A 21 2930 XDLW 070308 TN	–	–	–	HB7705 eShop	–	–	10	0.85	0.36
21A 21 2932 XDLW 070308 ER	–	–	–	HB7720 eShop	–	–	10	0.85	0.36
21A 21 2933 XDPW 070308 SR	–	–	–	HB7720 eShop	–	–	10	0.85	0.36
21A 21 2934 XDLT 070308 ER	–	–	–	–	HB7635 eShop	–	10	0.85	0.72
21A 21 2936 XDPT 070308 ER	–	–	–	–	HB7635 eShop	–	10	0.85	0.72
21A 21 2937 XDLT 070308 TN	–	–	–	–	HB7535 eShop	–	10	0.85	0.72
21A 21 2940 XDPW 070308 SR	–	–	–	–	–	HB4225 eShop	10	0.85	0.65
21H 21 2941 XDLW 070308 TN	–	–	–	–	–	KU7710 eShop	10	0.6	0.36

Programming radius at a_{p max}

mm

1.58

Milling inserts XD..09T308

Note:

21 2964 – Do not tighten insert screw No. 219933 to more than 2.2 Nm!



Type			ALU	ST900	ST1400	HART	INOX	GGG		$a_{p \max}$ mm	f_z mm
21A	21 2943	XDLT 09T308 ER	HU7810	eShop	–	–	–	–	10	1.15	0.79
21A	21 2946	XDLW 09T308 SR	HB7530	–	eShop	–	–	–	10	1.15	0.86
21A	21 2947	XDPW 09T308 SR	HB7530	–	eShop	–	–	–	10	1.15	0.86
21A	21 2950	XDLW 09T308 TN	HB7720	–	–	eShop	–	–	10	1.15	0.79
21A	21 2953	XDLW 09T308 SR	HB4025	–	–	eShop	–	–	10	1.15	0.79
21A	21 2951	XDLT 09T308 ER	HB7720	–	–	–	eShop	–	10	1.15	0.43
21A	21 2952	XDPT 09T308 ER	HB7720	–	–	–	eShop	–	10	1.15	0.43
21A	21 2955	XDLW 09T308 TN	HB7705	–	–	–	eShop	–	10	1.15	0.43
21A	21 2954	XDLW 09T308 ER	HB7720	–	–	–	eShop	–	10	1.15	0.43
21A	21 2956	XDPW 09T308 SR	HB7720	–	–	–	eShop	–	10	1.15	0.43
21A	21 2959	XDLT 09T308 ER	HB7635	–	–	–	–	eShop	10	1.15	0.86
21A	21 2961	XDPT 09T308 ER	HB7635	–	–	–	–	eShop	10	1.15	0.86
21A	21 2962	XDLT 09T308 TN	HB7535	–	–	–	–	eShop	10	1.15	0.86
21A	21 2963	XDPW 09T308 SR	HB4225	–	–	–	–	eShop	10	1.15	0.79
21H	21 2964	XDLW 09T308 TN	KU7710	–	–	–	–	eShop	10	0.8	0.43
Programming radius at $a_{p \max}$			mm	1.99							

Milling inserts XD..120408

Note:

21 2991 – Do not tighten insert screw No. 219800 to more than 3.8 Nm!



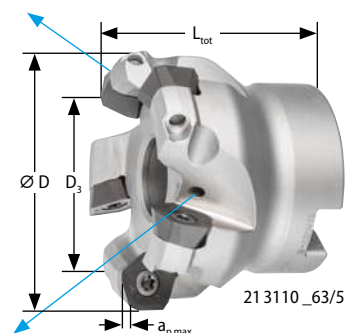
Type			ALU	ST900	ST1400	HART	INOX	GGG		$a_{p \max}$ mm	f_z mm
21A	21 2966	XDLT 120408 ER	HU7810	eShop	–	–	–	–	10	1.8	1
21A	21 2968	XDLW 120408 SR	HB7530	–	eShop	–	–	–	10	1.8	1.07
21A	21 2969	XDPW 120408 SR	HB7530	–	eShop	–	–	–	10	1.8	1.07
21A	21 2975	XDLW 120408 TN	HB7720	–	–	eShop	–	–	10	1.8	1
21A	21 2971	XDLW 120408 SR	HB4025	–	–	eShop	–	–	10	1.8	1
21A	21 2974	XDLT 120408 ER	HB7720	–	–	–	eShop	–	10	1.8	0.57
21A	21 2978	XDPT 120408 ER	HB7720	–	–	–	eShop	–	10	1.8	0.57
21A	21 2980	XDLW 120408 TN	HB7705	–	–	–	eShop	–	10	1.8	0.57
21A	21 2977	XDLW 120408 ER	HB7720	–	–	–	eShop	–	10	1.8	0.57
21A	21 2982	XDPW 120408 SR	HB7720	–	–	–	eShop	–	10	1.8	0.57
21A	21 2979	XDLT 120408 ER	HB7635	–	–	–	–	eShop	10	1.8	1.07
21A	21 2984	XDPT 120408 ER	HB7635	–	–	–	–	eShop	10	1.8	1.07
21A	21 2987	XDLT 120408 TN	HB7535	–	–	–	–	eShop	10	1.8	1.07
21A	21 2990	XDPW 120408 SR	HB4225	–	–	–	–	eShop	10	1.8	1
21H	21 2991	XDLW 120408 TN	KU7710	–	–	–	–	eShop	10	1	0.57
Programming radius at $a_{p \max}$			mm	2.6							



Garant Hi5 high feed rate indexable face mills for milling inserts POMX 10T5..

Description: Powerful and smooth-cutting high feed rate indexable face mill. Particularly smooth-running, due to unequal spacing of the teeth. Can also be used for semi-finishing. Cost-efficiency due to 5-edge inserts.

Note: Use GARANT torque screwdriver TQ No. **211750 size 5.7** with bit No. **674252 size 20IP**.



Ø D / number of teeth Z	210	21 3110	Ø D ₃	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø	Set of insert screws
		Hi5 high feed rate indexable face mill					
mm		with bore	mm	mm	mm	mm	
42/3		eShop	22.7	2.2	50	16	219889 (20IP; 5.7 Nm)
50/4		eShop	30.6	2.2	40	22	219889 (20IP; 5.7 Nm)
52/4		eShop	32.6	2.2	40	22	219889 (20IP; 5.7 Nm)
63/5		eShop	43.6	2.2	50	27	219889 (20IP; 5.7 Nm)
66/5		eShop	46.6	2.2	50	27	219889 (20IP; 5.7 Nm)
80/6		eShop	60.6	2.2	50	32	219889 (20IP; 5.7 Nm)
100/8		eShop	80.78	2.2	50	32	219889 (20IP; 5.7 Nm)
125/10		eShop	105.85	2.2	63	40	219889 (20IP; 5.7 Nm)

Garant Milling inserts for Hi5 high feed rate indexable face mill No. 213110

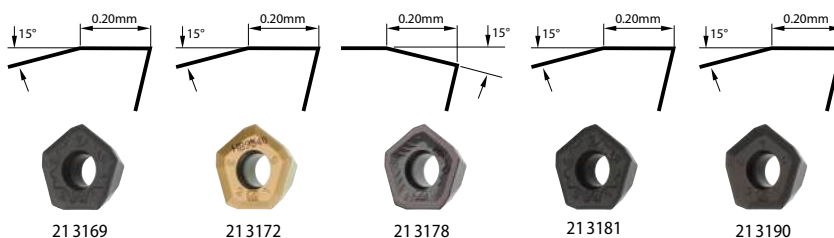
Sturdy insert version (thickness = 5.9 mm).
Positive geometry for high feed rates.
Flat cutting edge length: 2 mm for high surface quality.
Special cost-effectiveness due to 5 cutting edges.

21 3184/3193 – Preferred solution for difficult applications (interrupted cutting).

Note: Standard application values for a_e = 0.5 ... 1xD / a_{p max} = 2.2 mm.

a _e / D	0.5 ... 1.0	0.3	0.1
Correction factor f _z	1	1.4	2.2

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	500 N	750 N	900 N	1100 N	1400 N	55 HRC	60 HRC	65 HRC	67 HRC	70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
21 3169				420	400	380																	
21 3172/3193				260	200									170	130			●					
21 3178									50	40	35	30					300						
21 3181/3190				360	320	280								180	150	80		●					
21 3184														150	120	70			○				



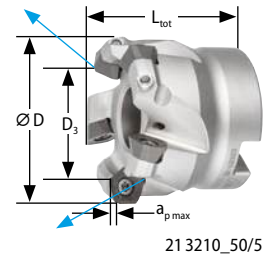
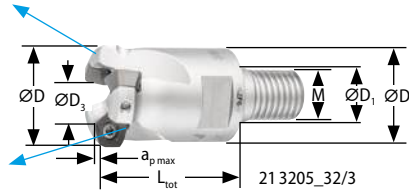
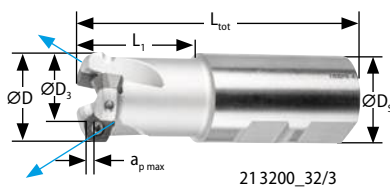
Type		ST900	ST1400	HART	INOX	UNI	
21A 21 3169	POMX 10TSZEER M	HB9525	eShop	—	—	—	10
21A 21 3172	POMX 10TSZEER M	HB9540	eShop	—	—	—	10
21A 21 3178	POMX 10TSZESR R	HB9715	—	eShop	—	—	10
21A 21 3181	POMX 10TSZEER M	HB9640	—	—	eShop	—	10
21A 21 3184	POMX 10TSZEER M	HB9645	—	—	eShop	—	10
21A 21 3190	POMX 10TSZEER U	HB9640	—	—	—	eShop	10
21A 21 3193	POMX 10TSZEER U	HB9540	—	—	—	eShop	10
Programming radius at a _{p max}		mm		4.8			
f _z		mm	1.1	1	0.6	1	—



Garant Hi5 high feed rate indexable face mills for milling inserts POMX 0704..

Particularly smooth-running, due to unequal spacing of the teeth.

Note: Use GARANT torque screwdriver TQ No. **211750 size 2.2** with bit No. **674252 size 10IP**.



Ø D / number of teeth Z	210	21 3200	Ø D ₃	maximum cutting depth a _{p max}	L ₁	L _{tot}	Ø D ₃ h6	Set of insert screws	
		Hi5 high feed rate indexable face mill							
mm		Weldon shank	mm	mm	mm	mm	mm		
25/2		eShop	10.6	1.4	36	92	25	219883 (10IP; 2.2 Nm)	
32/3		eShop	17.6	1.4	40	100	32	219884 (10IP; 2.2 Nm)	
40/4		eShop	25.6	1.4	50	110	32	219884 (10IP; 2.2 Nm)	
Ø D / number of teeth Z	210	21 3205	Ø D ₃	maximum cutting depth a _{p max}	Ø D ₁ h6	L _{tot}	Ø D ₂	Mounting thread M	Set of insert screws
		Hi5 high feed rate indexable face mill							
mm		with threaded shank	mm	mm	mm	mm	mm		
25/2		eShop	10.6	1.4	12.5	35	21	M12	219883 (10IP; 2.2 Nm)
32/3		eShop	17.6	1.4	17	43	29	M16	219884 (10IP; 2.2 Nm)
40/4		eShop	25.6	1.4	17	43	29	M16	219884 (10IP; 2.2 Nm)
Ø D / number of teeth Z	210	21 3210	Ø D ₃	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø	Set of insert screws		
		Hi5 high feed rate indexable face mill							
mm		with bore	mm	mm	mm	mm			
40/4		eShop	25.6	1.4	40	16	219884 (10IP; 2.2 Nm)		
50/5		eShop	35.6	1.4	40	22	219884 (10IP; 2.2 Nm)		
52/5		eShop	37.6	1.4	40	22	219884 (10IP; 2.2 Nm)		
63/6		eShop	48.6	1.4	50	27	219884 (10IP; 2.2 Nm)		
66/6		eShop	51.6	1.4	50	27	219884 (10IP; 2.2 Nm)		

Garant Milling inserts for Hi5 high feed rate indexable face mills No. 213200 – 213210

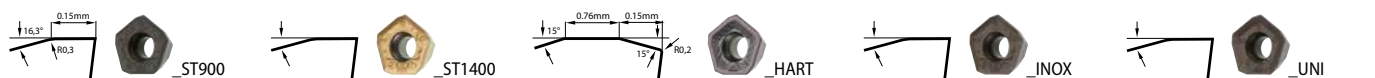
Flat cutting edge length: 1.5 mm, for high surface quality.

21 3137/3144 – Preferred solution for difficult applications (interrupted cutting).

Note: Standard application values for a_e = 0.5 ... 1 × D / a_{p max} = 1.4 mm.

a _e / D	0.5 ... 1.0	0.3	0.1
Correction factor f _t	1	1.4	2.2

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
21 3125				420	400	380																	
21 3128/3144					360	310	260	200						170	130			•				•	•
21 3131									50	40	35	30					300	•				•	•
21 3134/3141				360	320	280								180	150	80		•	○			•	•
21 3137														150	120	70		•	○			•	•



Type			ST900	ST1400	HART	INOX	UNI	
21A 21 3125	POMX 0704ZEER M	HB9525	eShop	–	–	–	–	10
21A 21 3128		HB9540	–	eShop	–	–	–	10
21A 21 3131	POMX 0704ZESR R	HB9715	–	–	eShop	–	–	10
21A 21 3134	POMX 0704ZEER M	HB9640	–	–	–	eShop	–	10
21A 21 3137		HB9645	–	–	–	eShop	–	10
21A 21 3141	POMX 0704ZEER U	HB9640	–	–	–	–	eShop	10
21A 21 3144		HB9540	–	–	–	–	eShop	10
Programming radius at a _{p max}	mm				3.61			
f _t	mm		1	0.9	0.5	0.9	–	



Garant Indexable face mill 43° Octo for milling inserts OF.. 050405

43° indexable face mill with up to 8 edges per milling insert.

Application: Very good surface finishes are obtained due to the positive geometry. Smooth-cutting face mills.

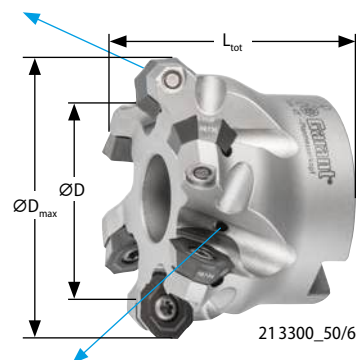
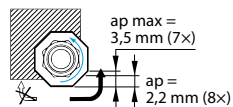
Note: To use all **8 cutting edges**, the insert **always has to be turned in the indicated direction**.

Standard application values for $a_e = 0.5 \dots 1 \times D$.

$a_{p \max}$ 2.2 mm: (**Z = 8**),

$a_{p \max}$ 3.5 mm: (**Z = 7**).

Use GARANT torque screwdriver TQ No. **211750 size 3.8** with bit No. **674252 size 15IP**.



a_e / D	0.5 ... 1.0	0.3	0.1
Correction factor f_z	1	1.4	2.2

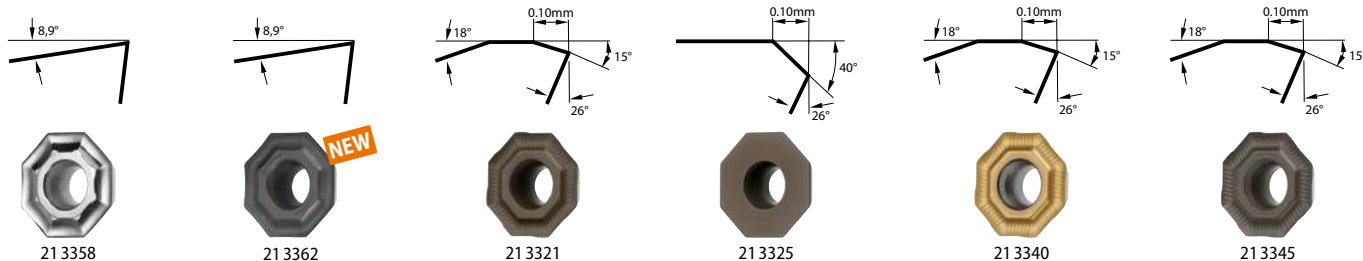
Ø D / number of teeth Z	21 3300	Ø D _{max}	L _{tot}	Mounting bore Ø	Set of insert screws
	Indexable face mill 43° Octo				
mm	with bore	mm	mm	mm	
32/3	eShop	41	40	16	219808 (15IP; 3.8 Nm)
40/5	eShop	49	40	16	219808 (15IP; 3.8 Nm)
50/4	eShop	59	40	22	219808 (15IP; 3.8 Nm)
50/6	eShop	59	40	22	219808 (15IP; 3.8 Nm)
63/5	eShop	72	40	22	219808 (15IP; 3.8 Nm)
63/7	eShop	72	40	22	219808 (15IP; 3.8 Nm)
80/6	eShop	89	50	27	219808 (15IP; 3.8 Nm)
100/7	eShop	109	50	32	219808 (15IP; 3.8 Nm)
125/8	eShop	134	63	40	219808 (15IP; 3.8 Nm)

Garant Milling inserts OF.. 050405 for indexable face mill No. 213300

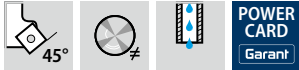
Extremely strong inserts to the standard ISO dimensions, precision sintered and ground.

Micro-grain substrates ensure high toughness and good wear resistance.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	H	H	H	M	M	S	K	N	N
213320				280	260	200	135	110		160	145		170		
213321				350	240	210	200	180		220	140		160		
213325				390	275	245	230	210		280	180		180		
213340	795	720	645	260	185	150	140	135		190	120	45	120		
213345				300	210	180	170	160		210	130	45	140		
213358	1350	1150	700										690		
213362	1350	1350	950												



Type		ALU	ST900	ST1400	INOX	UNI	
21A 21 3358	OFMT 050405 TN	HU7815	eShop	—	—	—	10
21B 21 3362	OFMT 050405 diamond coated	HB7810	eShop	—	—	—	1
21A 21 3320	OFMT 050405 TR	HB7525	—	eShop	—	—	10
21A 21 3321	OFMT 050405 TR	HB7525	—	eShop	—	—	10
21A 21 3325	OFMT 050405 TN	HB7515	—	—	eShop	—	10
21A 21 3340	OFMT 050405 TR	HB7635	—	—	eShop	—	10
21A 21 3345	OFMT 050405	HB735	—	—	—	eShop	10
f_z	mm	0.18	0.17	0.14	0.14	—	



Garant TwinCut high-performance indexable face mills 45°, wide, normal and close pitch

From Ø 160 mm for arbors to DIN 2079, with 4 additional attachment holes and without internal cooling.

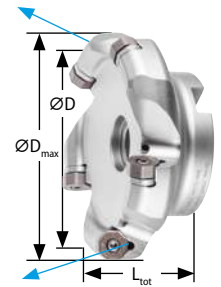
Application: With double-sided 8-edge inserts (ON.U) or 4-edge inserts (SN.U).

Spare part: Shim No. 219897 for use with both types of indexable insert.

Note: Do not mix different types of insert ON.U and SN.U.
Use GARANT torque screwdriver TQ No. **211750 size 3.8** with bit No. **674252 size 15IP**.



SN.U

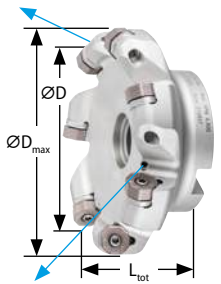


21 3410_100/5 ON.U

Ø D / number of teeth Z	210	21 3410	Ø D _{max}	Ø D _{max}	L _{tot}	L _{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws	Shim	Clamp screw for shim
		TwinCut indexable face mill 45° wide pitch with bore	ON.U	SN.U	SN.U	ON.U					
mm			mm	mm	mm	mm	mm				
50/3		eShop	61.8	65.2	40	38.3	22	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
63/4		eShop	74.8	78.2	40	38.3	22	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
80/4		eShop	91.8	95.2	50	48.3	27	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
100/5		eShop	111.8	115.2	50	48.3	32	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
125/6		eShop	136.8	140.2	63	61.3	40	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
160/7		eShop	171.8	175.2	63	61.3	40	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
200/8		eShop	211.8	215.2	63	61.3	60	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
250/10		eShop	261.8	265.2	63	61.3	60	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899



SN.U

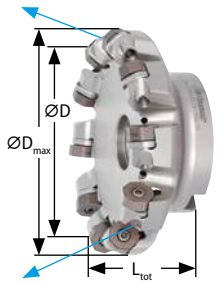


21 3415_100/7 ON.U

Ø D / number of teeth Z	210	21 3415	Ø D _{max}	Ø D _{max}	L _{tot}	L _{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws	Shim	Clamp screw for shim
		TwinCut indexable face mill 45° normal pitch with bore	ON.U	SN.U	SN.U	ON.U					
mm			mm	mm	mm	mm	mm				
50/4		eShop	61.8	65.2	40	38.3	22	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
63/5		eShop	74.8	78.2	40	38.3	22	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
80/6		eShop	91.8	95.2	50	48.3	27	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
100/7		eShop	111.8	115.2	50	48.3	32	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
125/8		eShop	136.8	140.2	63	61.3	40	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
160/10		eShop	171.8	175.2	63	61.3	40	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
200/12		eShop	211.8	215.2	63	61.3	60	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
250/14		eShop	261.8	265.2	63	61.3	60	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899



SN.U



21 3420_100/10 ON.U

Ø D / number of teeth Z	210	21 3420	Ø D _{max}	Ø D _{max}	L _{tot}	L _{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws	Shim	Clamp screw for shim
		TwinCut indexable face mill 45° close pitch with bore	ON.U	SN.U	SN.U	ON.U					
mm			mm	mm	mm	mm	mm				
40/3		eShop	51.8	55.2	40	38.3	16	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
50/5		eShop	61.8	65.2	40	38.3	22	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
63/6		eShop	74.8	78.2	40	38.3	22	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
80/8		eShop	91.8	95.2	50	48.3	27	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
100/10		eShop	111.8	115.2	50	48.3	32	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
125/12		eShop	136.8	140.2	63	61.3	40	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
160/14		eShop	171.8	175.2	63	61.3	40	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
200/16		eShop	211.8	215.2	63	61.3	60	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899
250/18		eShop	261.8	265.2	63	61.3	60	SN.U; ON.U	219898 (15IP; 3.8 Nm)	219897	219899

Garant Milling inserts ON.U, SN.U and XNEU for TwinCut indexable face mills No. 213410 - 213420

21 3424–3438 – Double-sided with 2x8 cutting edges.

21 3440/3468/3470 – Wiper edge insert with 1 cutting edge.

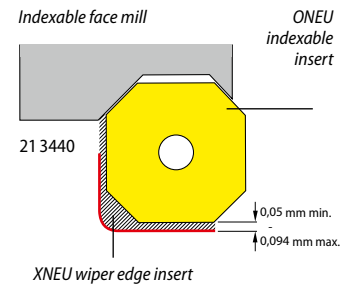
21 3444–3466 – Double-sided with 2x4 cutting edges.

Recommendation: For the best surface quality choose insert tolerance E in combination with wiper edge insert(s).

Note: Standard application values for $a_e = 0.5 \dots 1 \times D / a_{p \max}$

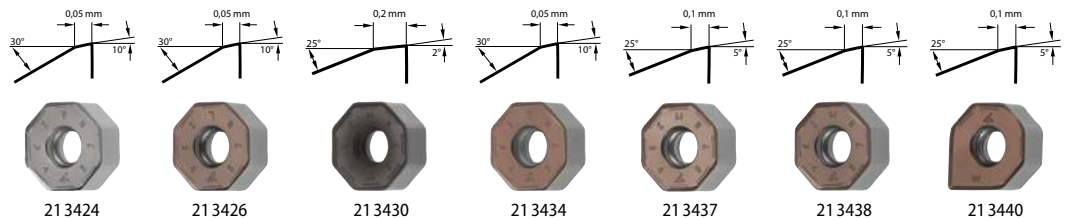
21 3440 – Length of the flat chamfer 7.6 mm.

21 3468/3470 – Length of the wiper flat 8 mm.

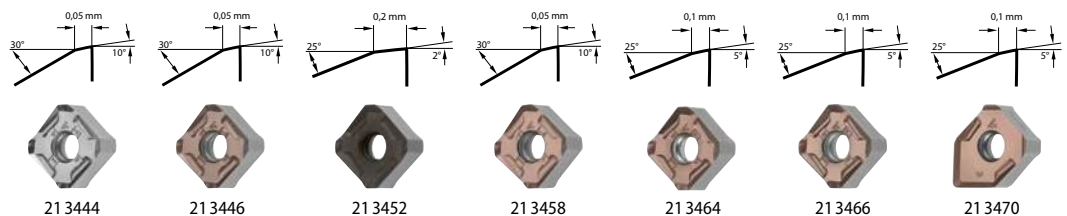


a_e / D	0.5 ... 1.0	0.3	0.1
Correction factor f_z	1.0	1.4	2.2

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si										INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	K					
21 3424/3444	750	750	500																			
21 3426/3446				300	280	260																
21 3430/3452							220	200														
21 3432							170	150														
21 3433–21 3435/ 3458/3460													200	160								
21 3437/3464																200						
21 3438/3466				280	260	240							140	120								



Type			ALU	ST900	ST1400	INOX	GG	UNI		$a_{p \max}$ mm
21A 21 3424	ONEU 05T6 ANER	HU7810	eShop	–	–	–	–	–	10	3
21A 21 3426	ONMU 05T6 ANER	HB7520	–	eShop	–	–	–	–	10	3
21A 21 3430	ONEU 05T6 ANER	HB7510	–	–	eShop	–	–	–	10	3
21A 21 3432	ONEU 05T6 ANER	HB7520	–	–	eShop	–	–	–	10	3
21A 21 3434	ONMU 05T6 ANER	HB7630	–	–	–	eShop	–	–	10	3
21A 21 3433	ONEU 05T6 ANER	HB7630	–	–	–	eShop	–	–	10	3
21A 21 3435	ONMU 05T6 ANER	HB8630	–	–	–	eShop	–	–	10	3
21A 21 3437	ONMU 05T6 ANER	HB7730	–	–	–	–	eShop	–	10	3
21A 21 3438	ONMU 05T6 ANER	HB7520	–	–	–	–	–	eShop	10	3
21A 21 3440	XNEU 05T6 ANEN-W Wiper edge insert	HB7730	–	–	–	–	–	eShop	10	3
f_z	mm		0.23	0.3	0.25	0.2	0.3	–		



Type			ALU	ST900	ST1400	INOX	GG	UNI		$a_{p \max}$ mm
21A 21 3444	SNEU 14T7 ANER	HU7810	eShop	–	–	–	–	–	10	6
21A 21 3446	ONMU 14T7 ANER	HB7520	–	eShop	–	–	–	–	10	6
21A 21 3452	ONMU 14T7 ANER	HB7510	–	–	eShop	–	–	–	10	6
21A 21 3458	ONMU 14T7 ANER	HB7630	–	–	–	eShop	–	–	10	6
21A 21 3460	ONMU 14T7 ANER	HB8630	–	–	–	eShop	–	–	10	6
21A 21 3464	ONMU 14T7 ANER	HB7730	–	–	–	–	eShop	–	10	6
21A 21 3466	ONMU 14T7 ANER	HB7520	–	–	–	–	–	eShop	10	6
21A 21 3468	XNEU 14T7 ANEN-W	HB7520	–	–	–	–	–	eShop	10	6
21A 21 3470	XNEU 14T7 ANEN-W Wiper edge insert	HB7730	–	–	–	–	–	eShop	10	6
f_z	mm		0.23	0.3	0.25	0.2	0.3	–		



MTC

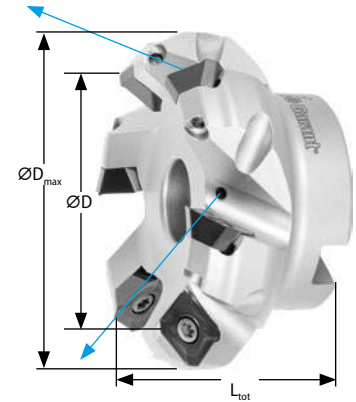


Garant GARANT Softcut® 45° high-performance indexable face mill for SE.T1305 and XEEW inserts

High number of cutting edges for very high productivity.
Positive rake for soft cut and low power consumption.
Individual tool geometry ensures very smooth cutting.

Size 160/12–250/16 – For arbors to DIN 2079, with 4 additional attachment holes and without internal cooling.

Note: Use GARANT torque screwdriver TQ No. **211750 3.0** with bit No. **674252 15IP**.



Ø D / number of effective cutting edges Z	210	21 3555	Ø D _{max}	L _{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
mm		with bore	mm	mm	mm		
32/3		eShop	44	40	16	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
40/3		eShop	52.2	40	16	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
40/4		eShop	52.2	40	16	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
50/4		eShop	62.1	40	22	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
50/5		eShop	62.1	40	22	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
63/4		eShop	75	40	22	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
63/6		eShop	75	40	22	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
80/6		eShop	92.1	50	27	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
80/8		eShop	92.1	50	27	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
100/8		eShop	112.2	50	32	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
100/10		eShop	112.2	50	32	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
125/10		eShop	137.3	63	40	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
125/12		eShop	137.3	63	40	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
160/12		eShop	172.3	63	40	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
200/14		eShop	212.3	63	60	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)
250/16		eShop	262.3	63	60	SE.T1305; XEEW1305	219833 (15IP; 3.0 Nm)

Garant Milling inserts SE.T1305 and XEEW1305 for GARANT Softcut® 45 high-performance indexable face mill

Increased insert thickness for the highest metal removal rates.
Protected against wear by the latest coating.

Note: Standard application values for $a_e = 0.5 \dots 1 \times D / a_{pmax} = 4$ mm.
21 3596 – For the best surface quality, use at least one wiper edge insert.
Length of the flat chamfer 7.2 mm.
21 3566/3573/3586 – For the best surface quality, use together with No. 213596 UNI.

a_e / D	0.5 ... 1.0	0.3	0.1
Correction factor f_z	1.0	1.4	2.2

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	Y < 500 N	Y < 750 N	Y < 900 N	Y < 1100 N	Y < 1400 N	Y < 55 HRC	Y < 60 HRC	Y < 65 HRC	Y < 67 HRC	Y < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G) > 850 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
21 3564	700	700	650																				
21 3566/3568				240	200	180																	
21 3573/3577							130	120															
21 3586/3588														170	130	30							
21 3592				220	180	160	90	90						150	120		90						



Type	ALU	ST900	ST1400	INOX	UNI	
21A 21 3564	SEET 1305 AGFR	HU7810	eShop	–	–	10
21A 21 3566	SEET 1305 AGSR	HB7520	–	eShop	–	10
21A 21 3568	SEMT 1305 AGSR	HB7520	–	eShop	–	10
21A 21 3573	SEET 1305 AGSR	HB7510	–	–	eShop	10
21A 21 3577	SEMT 1305 AGSR	HB7510	–	–	eShop	10
21A 21 3586	SEET 1305 AGSR	HB8630	–	–	eShop	10
21A 21 3588	SEMT 1305 AGSR	HB8630	–	–	eShop	10
21A 21 3592	SEMT 1305 AGSR	HB7520	–	–	eShop	10
21A 21 3596	XEEW 1305 AGER Wiper edge insert	HB7730	–	–	eShop	10
f_z	mm	0.2	0.2	0.22	0.22	–

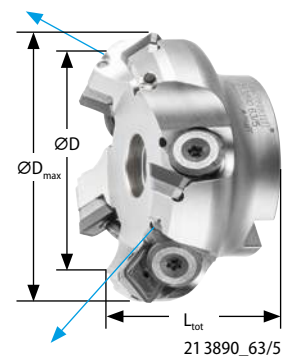


Garant Indexable face mill 45° for milling inserts SE..1203..

45° indexable face mill with unequal pitch for smooth cutting.

Precision insert pockets due to special carbide shims.

Size 160/7–250/13 – For arbors to DIN 2079, with 4 additional attachment holes.



Ø D / number of teeth Z	210	21 3890	Ø D _{max}	L _{tot}	Mounting bore Ø	suitable indexable insert	Clamp screw for insert	Shim	Clamp screw for shim
		Indexable face mill 45°							
mm		with bore	mm	mm	mm				
50/4		eShop	63	48	22	SE.. 1203..	219862 (25IP; 6 Nm)	219860	219861 (TX8)
63/5		eShop	76	40	22	SE.. 1203..	219862 (25IP; 6 Nm)	219860	219861 (TX8)
80/6		eShop	93	50	27	SE.. 1203..	219862 (25IP; 6 Nm)	219860	219861 (TX8)
100/6		eShop	113	50	32	SE.. 1203..	219862 (25IP; 6 Nm)	219860	219861 (TX8)
125/7		eShop	138	63	40	SE.. 1203..	219862 (25IP; 6 Nm)	219860	219861 (TX8)
160/7		eShop	178	63	40	SE.. 1203..	219862 (25IP; 6 Nm)	219860	219861 (TX8)
200/10		eShop	213	63	60	SE.. 1203..	219862 (25IP; 6 Nm)	219860	219861 (TX8)
250/13		eShop	263	63	60	SE.. 1203..	219862 (25IP; 6 Nm)	219860	219861 (TX8)

Garant Milling inserts SE.. 1203.. for indexable face mill No. 213890

Note: Standard application values for $a_e = 0.5 \dots 1 \times D / a_{p \max} = 3.5 \text{ mm}$.

a_e / D	0.5 ... 1.0	0.3	0.1
Correction factor f_z	1	1.4	2.2

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	ISO 500 N	ISO 750 N	ISO 900 N	ISO 1100 N	ISO 1400 N	ISO 55 HRC	ISO 60 HRC	ISO 65 HRC	ISO 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
21 3900				300	250	220																	
21 3905																130							
21 3906			650	260	200	160	140	120					170	120	40	140							
21 3909				215	205	200	95	95					90			130							
21 3921				235	230	220	105	105					170			130							
21 3922/3923				260	180	150	140	130					170	110		120							
21 3925				215	205	200	95	95					90	80	65								
21 3950				290	230	170	105	105															
21 3951				290	210	170	160	150					210	140		130							
21 3960	725	500	350																				
21 3961	725	650	480																				



21 3960



21 3900



21 3922



21 3950



21 3925



21 3905



21 3906

Type			ALU	ST500	ST900	ST1400	INOX	GG	UNI	
21A 21 3960	SEKR 1203 AFFN	HU7710	eShop	–	–	–	–	–	–	10
21B 21 3961	SEKR 1203 AFFN diamond-coated	HB7810	eShop	–	–	–	–	–	–	1
21A 21 3900	SEEN 1203 AFTN	CU7725	–	eShop	–	–	–	–	–	10
21A 21 3921	SEKR 1203 AFTN	HB7525	–	–	eShop	–	–	–	–	10
21A 21 3922	SEKN 1203 AFTN	HB7525	–	–	eShop	–	–	–	–	10
21A 21 3923	SEKR 1203 AFTN	HB7525	–	–	eShop	–	–	–	–	10
21A 21 3950	SECN 1203 AFSN	HB7735	–	–	–	eShop	–	–	–	10
21A 21 3951	SEKN 1203 AFTN	HB7515	–	–	–	eShop	–	–	–	10
21A 21 3925	SEKR 1203 AFTN	HB7635	–	–	–	–	eShop	–	–	10
21A 21 3905		HB7710	–	–	–	–	–	eShop	–	10
21A 21 3906	SEKN 1203 AFTN	HB735	–	–	–	–	–	–	eShop	10
21A 21 3909		HB7525	–	–	–	–	–	–	eShop	10
f_z		mm	0.24	0.19	0.19	0.19	0.19	0.15	–	



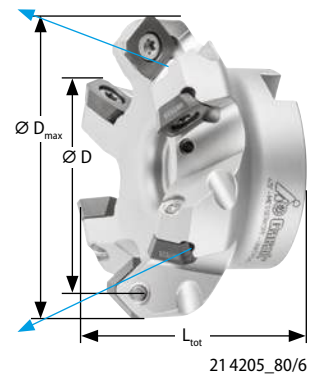
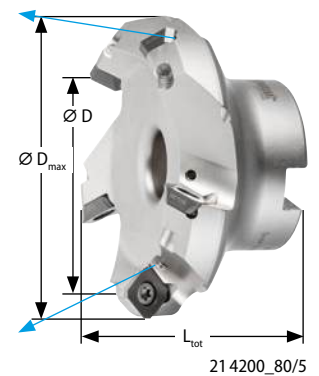
MTC

Garant Indexable face mill 45° MTC for milling inserts SE.. 1204..

Size 160/7–250/16 – For arbors to DIN 2079, with 4 additional attachment holes.

Note: Use GARANT torque screwdriver TQ No. **211750 size 5.7** with bit shank No. **674252 size 20IP**.
Size 160/7–250/16 – For technical reasons **without internal coolant supply**.

Ø D / number of teeth Z	210	21 4200	Ø D _{max}	L _{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
		Indexable face mill 45° right-hand cutting					
mm		with bore	mm	mm	mm		
32/3		eShop	44	40	16	SE.. 1204..	219800 (20IP; 5.7 Nm)
40/3		eShop	53	40	16	SE.. 1204..	219800 (20IP; 5.7 Nm)
40/4		eShop	53	40	16	SE.. 1204..	219800 (20IP; 5.7 Nm)
50/4		eShop	63	40	22	SE.. 1204..	219800 (20IP; 5.7 Nm)
50/5		eShop	63	40	22	SE.. 1204..	219800 (20IP; 5.7 Nm)
63/4		eShop	75	40	22	SE.. 1204..	219800 (20IP; 5.7 Nm)
63/6		eShop	75	40	22	SE.. 1204..	219800 (20IP; 5.7 Nm)
80/5		eShop	93	50	27	SE.. 1204..	219800 (20IP; 5.7 Nm)
80/6		eShop	93	50	27	SE.. 1204..	219800 (20IP; 5.7 Nm)
80/8		eShop	93	50	27	SE.. 1204..	219800 (20IP; 5.7 Nm)
100/6		eShop	113	50	32	SE.. 1204..	219800 (20IP; 5.7 Nm)
100/8		eShop	113	50	32	SE.. 1204..	219800 (20IP; 5.7 Nm)
125/7		eShop	138	63	40	SE.. 1204..	219800 (20IP; 5.7 Nm)
125/10		eShop	138	63	40	SE.. 1204..	219800 (20IP; 5.7 Nm)
160/7		eShop	173	63	40	SE.. 1204..	219800 (20IP; 5.7 Nm)
160/12		eShop	173	63	40	SE.. 1204..	219800 (20IP; 5.7 Nm)
200/14		eShop	216	63	40	SE.. 1204..	219800 (20IP; 5.7 Nm)
250/16		eShop	263	63	60	SE.. 1204..	219800 (20IP; 5.7 Nm)



21



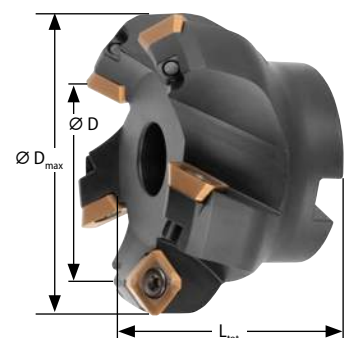
MTC

HOLEX Indexable face mill 45° for milling inserts SE.. 1204..

Without through-coolant feed.

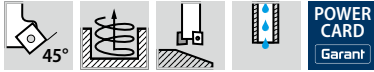
Note: Use GARANT torque screwdriver TQ No. **211750 size 5.7** with bit No. **674252 size 20IP**.

Ø D / number of effective cutting edges Z	220	21 4202	Ø D _{max}	L _{tot}	Mounting bore Ø	Set of insert screws
		Indexable face mill 45°				
mm		with bore	mm	mm	mm	
50/4		eShop	63	48	22	219848 (20IP; 5.7 Nm)
63/5		eShop	76	48	22	219848 (20IP; 5.7 Nm)
80/6		eShop	93	50	27	219848 (20IP; 5.7 Nm)
100/6		eShop	113	50	32	219848 (20IP; 5.7 Nm)



21 4202_63/5

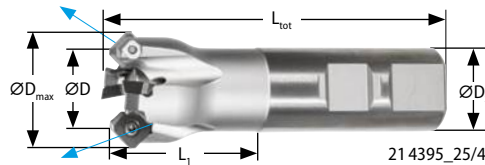
Length of the flat chamfer 8 mm.



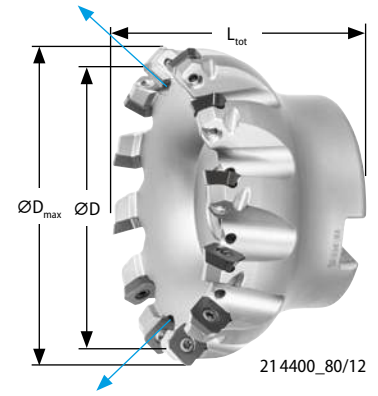
Garant Indexable face mill 45° for milling inserts SD.. 0903..

High number of cutting edges for very high productivity. Positive rake for soft cut and low power consumption.

Note: Use GARANT torque screwdriver TQ No. 211750 size 1.5 with bit No. 674252 size 8IP.



21 4395_25/4



21 4400_80/12

Ø D / number of teeth Z	210 21 4395	Ø D_max	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	Set of insert screws
mm	Indexable face mill 45°											
	Weldon shank											
16/2	eShop	24.2	40	90	20	SD... 0903	40	46	1.5	2.12	13.5	219809 (8IP; 1.5 Nm)
20/3	eShop	28.2	40	90	20	SD... 0903	48	54	1.5	1.64	17.5	219809 (8IP; 1.5 Nm)
25/4	eShop	33.2	44	100	25	SD... 0903	58	64	1.5	1.27	22.5	219809 (8IP; 1.5 Nm)

Ø D / number of teeth Z	210 21 4400	Ø D_max	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
mm	Indexable face mill 45°										
	with bore										
32/4	eShop	40.2	40	16	72	78	1.5	0.97	29.5	SD... 0903	219809 (8IP; 1.5 Nm)
40/6	eShop	48.2	40	16	88	94	1.5	0.76	37.5	SD... 0903	219809 (8IP; 1.5 Nm)
50/6	eShop	58.2	40	22	108	114	1.5	0.6	47.5	SD... 0903	219809 (8IP; 1.5 Nm)
50/8	eShop	58.2	40	22	108	114	1.5	0.6	47.5	SD... 0903	219809 (8IP; 1.5 Nm)
63/5	eShop	71.2	40	22	134	140	1.5	0.47	60.5	SD... 0903	219809 (8IP; 1.5 Nm)
63/8	eShop	71.2	40	22	134	140	1.5	0.47	60.5	SD... 0903	219809 (8IP; 1.5 Nm)
63/10	eShop	71.2	40	22	134	140	1.5	0.47	60.5	SD... 0903	219809 (8IP; 1.5 Nm)
80/10	eShop	88.2	50	27	168	174	1.5	0.37	77.5	SD... 0903	219809 (8IP; 1.5 Nm)
80/12	eShop	88.2	50	27	168	174	1.5	0.37	77.5	SD... 0903	219809 (8IP; 1.5 Nm)
100/12	eShop	108.2	50	32	208	214	1.5	0.29	97.5	SD... 0903	219809 (8IP; 1.5 Nm)
100/14	eShop	108.2	50	32	208	214	1.5	0.29	97.5	SD... 0903	219809 (8IP; 1.5 Nm)
125/14	eShop	133.2	63	40	258	264	1.5	0.23	122.5	SD... 0903	219809 (8IP; 1.5 Nm)

Garant Milling inserts SD.. 0903.. for 45° indexable face mills No. 214395 / 214400

- Indexable inserts for higher cutting speeds and feed rates.
- Precision sintered and ground for best surface finish quality.

Note: Standard application values for a_e = 0.5 ... 1xD / a_{p max} = 3 mm.

a _e / D	0.5 ... 1.0	0.3	0.1
Correction factor f _z	1.0	1.4	2.2

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP	Uni	Oil	Water	Chip	Chip	Chip
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N						
21 4439				410	290	240	220	190					300	190		190							
21 4440				350	255	230	180	130					165	130		235							
21 4441			650	260	200	160	140	120					170	120	40	140							
21 4460				270	220	220	150	105					100	80	50								
21 4470																235							
21 4475				350	255	230																	
21 4477				360	255	215	190	170								160							
21 4478	1500	1000	500										230	150									
21 4479	1500	1300	680																				



21 4479

21 4440

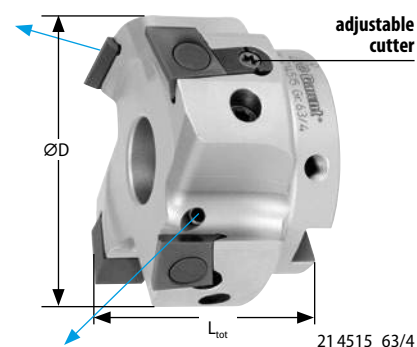
Type	ALU	ST500	ST900	ST1400	INOX	GG	UNI	
21A 21 4478	SDHT 0903 AFFN	—	—	—	—	—	—	10
21B 21 4479	SDHT 0903 AEFN diamond coated	—	—	—	—	—	—	1
21A 21 4475	SDHW 0903 AESN	—	eShop	—	—	—	—	10
21A 21 4477	SDMX 0903 AFEN	—	—	eShop	—	—	—	10
21A 21 4439	SDHX 0903 AFTN	—	—	—	eShop	—	—	10
21A 21 4460	SDMX 0903 AFEN	—	—	—	—	eShop	—	10
21A 21 4470	SDHT 0903 AEEN	—	—	—	—	eShop	—	10
21A 21 4440	SDMX 0903 AFEN	—	—	—	—	—	eShop	10
21A 21 4441	SDMX 0903 AFEN	—	—	—	—	—	eShop	10
f _z	mm	0.19	0.19	0.14	0.14	0.14	0.17	—

NEW



Garant Aluking 90° tangential high-performance indexable face / shoulder mill adjustable HPC

Tangential indexable face/shoulder mill for milling **exact 90° corners**.
Cutters partially adjustable in the vertical sense for very high accuracies.
Precise insert seating thanks to clamping stud locking.



Ø D / number of teeth Z	21P 21 4515 Aluking indexable face / shoulder mill 90° HPC	Inserts adjustable	L _{tot}	Mounting bore Ø	suitable indexable insert	Adjustment screw	Clamping studs	Pin tightening screw
mm	with bore		mm	mm				
40/2	eShop	—	40	16	BG.. 15L5..	—	219893	219894 (3AF; 5.0 Nm)
50/3	eShop	—	40	22	BG.. 15L5..	—	219893	219894 (3AF; 5.0 Nm)
63/4	eShop	1	40	22	BG.. 15L5..	219892	219893	219894 (3AF; 5.0 Nm)
80/5	eShop	1	50	27	BG.. 15L5..	219892	219893	219894 (3AF; 5.0 Nm)
100/6	eShop	2	50	32	BG.. 15L5..	219892	219893	219894 (3AF; 5.0 Nm)
125/8	eShop	2	63	40	BG.. 15L5..	219892	219893	219894 (3AF; 5.0 Nm)

Garant BGHX.. indexable inserts for Aluking tangential high performance indexable face / shoulder mill No. 214515

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si													INOX	INOX	GG(G)	GRP	CRP	Graphite					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	H	H	M	M	K	N	N	N					
21 4525	750	750	300																							
21 4531	900	600	350																				●		●	
21 4540	3500	3500	1000																1000	1000	500		●		●	
21 4543				240	220	220	200	200																	●	
21 4545																120	100								●	
21 4547																		220							●	

Milling inserts

21 4540 – With additional wide smooth flat chamfer.

21 4525/4531 – Precision ground carbide indexable inserts, ideal for machining thin-walled aluminium material.

21 4543/4545 – Precision-ground carbide indexable insert for high surface qualities when face milling.

Application:

21 4540 – For high cutting speeds and high surface quality. Preferably for use in adjustable insert seatings.
Different types of inserts can be mixed.

21 4543/4547 – For surfaces with roughness less than R_a 3 µm. Only for dry machining.

Note:

21 4525/4531 – Standard application values for a_e = 1×D / a_p = 5 mm, a_{p max} = 10 mm.

21 4540–4547 – Standard application values for a_e = 1×D / a_p = 3 mm, a_{p max} = 5 mm.

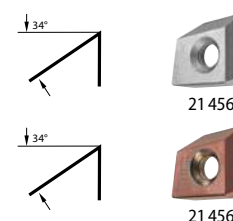
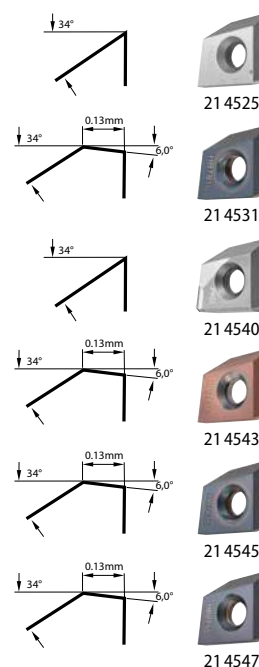
Type			ALU	ST1400	INOX	GG	
21B 21 4525	BGHX 15L5 PCFR	HU7810	eShop	—	—	—	10
21B 21 4531	BGHX 15L5 PCTR	HB7810	eShop	—	—	—	10
21L 21 4540	BGHX 15L5 PCER	PCD	eShop	—	—	—	1
21B 21 4543	BGHX 15L5 PCER	HB7535	—	eShop	—	—	10
21B 21 4545	BGHX 15L5 PCTR	HB7635	—	—	eShop	—	10
21B 21 4547	BGHX 15L5 PCTR	HB9710	—	—	—	eShop	10
f _t	mm		0.25	0.2	0.14	0.2	

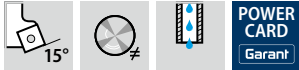
Wiper edge inserts



Carbide indexable inserts with wide wiper edge for fitting on adjustable insert seatings.
Length of the flat chamfer: 5 mm.

Type			ALU	ST1400
21B 21 4563	Wiper edge insert	HU7810	eShop	—
21B 21 4565	Wiper edge insert	HB7535	—	eShop



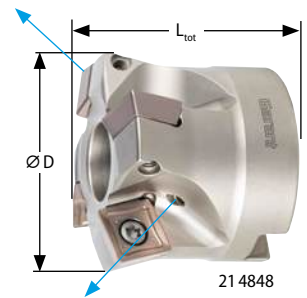


Garant GARANT Softcut® HSI high feed rate milling cutter for inserts SO.T 1205

The indexable inserts are positioned at 15° in the tool body.

Application: Select f_z value 0.8 mm.

Note: Use GARANT torque screwdriver TQ No. 211750 size 3.0 with bit No. 674252 size 15IP.



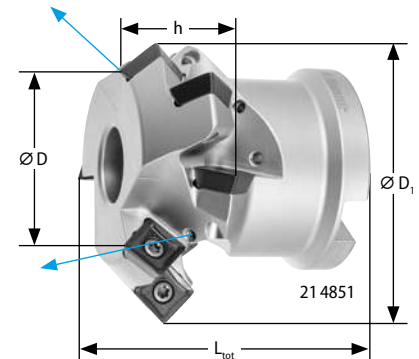
Ø D / number of teeth Z	210	21 4848	Ø D ₃	maximum cutting depth $a_{p \max}$	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Ramping angle $\alpha_{\max}$	Ramping length L for $\alpha_{\max}$	Set of insert screws
mm		with bore	mm	mm	mm	mm	mm	mm	mm	mm	
42/3		eShop	17.4	2.8	40	16	56.5	78.3	1.75	15	219833 (15IP; 3Nm)
50/4		eShop	27.4	2.8	40	22	76.5	98.3	1.25	25	219833 (15IP; 3Nm)
52/4		eShop	29.4	2.8	40	22	80.5	102.3	1.25	27	219833 (15IP; 3Nm)
63/5		eShop	40.4	2.8	40	22	102.3	124.3	0.75	38	219833 (15IP; 3Nm)



Garant GARANT Softcut® HIS chamfer mill 45° for inserts SO.T 1205

Application: Suitable for front and back chamfering.

Note: Use GARANT torque screwdriver TQ No. 211750 size 3.0 with bit No. 674252 size 15IP.



Ø D	210	21 4851	Number of effective inserts Z _{eff}	Number of indexable inserts	L _{tot}	smallest Ø D	largest Ø D ₁	achievable chamfer length l	achievable chamfer height h	Mounting bore Ø	Set of insert screws
mm		with bore			mm	mm	mm	mm	mm	mm	
53,9		eShop	3	9	65	53.9	85	22	15	27	219833 (15IP; 3.0 Nm)



Garant GARANT Softcut® HSI for milling inserts SO.T 1205.. and XOEW

Individual tool geometry ensures very smooth cutting.

Exceptionally sturdy insert design for best feed rates.

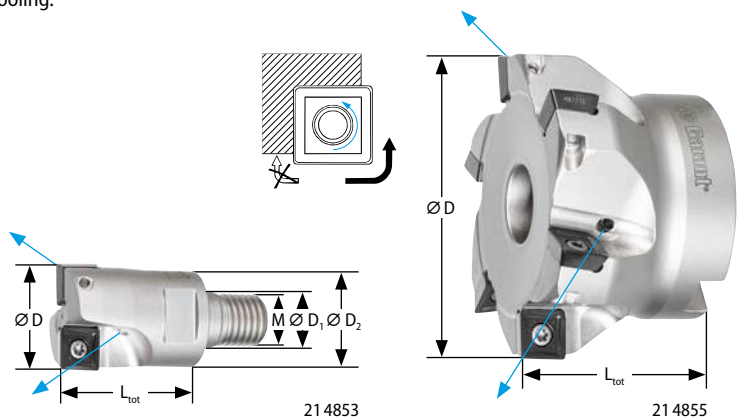
Indexable inserts are secured by special screws with high shear resistance.

21 4855 Size 160/10/4857 Size 160/14 – For arbors to DIN 2079, with 4 additional attachment holes and without internal cooling.

Application: For outstanding surface quality. Burr-free milling.

Note: For exact 90° corners, select $a_p = 8$ mm.
To use all 4 cutting edges, the insert must always be turned in the direction shown (anticlockwise).
Use GARANT torque screwdriver TQ No. 211750 size 3.0 with bit No. 674252 size 15IP.

21 4857 – For $a_e > 0.5 \times D$, reduce $a_{p \max}$ to 6 mm.



Ø D / number of teeth Z	210	21 4853	maximum cutting depth $a_{p \max}$	L _{tot}	Ø D ₁ h6	Ø D ₂	Mounting thread M	suitable indexable insert	Set of insert screws
mm		with threaded shank	mm	mm	mm	mm			
32/2		eShop	10	42	17	28.7	M16	SO.. 1205..	219833 (15IP; 3.0 Nm)

Ø D / number of teeth Z	210	21 4855	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
		GARANT Softcut HSI wide pitch					
mm		with bore	mm	mm	mm		
50/4		eShop	10	40	22	SO.. 1205..	219833 (15IP; 3.0 Nm)
63/4		eShop	10	40	22	SO.. 1205..	219833 (15IP; 3.0 Nm)
80/6		eShop	10	50	27	SO.. 1205..	219833 (15IP; 3.0 Nm)
100/8		eShop	10	50	32	SO.. 1205..	219833 (15IP; 3.0 Nm)
125/8		eShop	10	63	40	SO.. 1205..	219833 (15IP; 3.0 Nm)
160/10		eShop	10	63	40	SO.. 1205..	219833 (15IP; 3.0 Nm)

Ø D / number of teeth Z	210	21 4857	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
		GARANT Softcut HSI close pitch					
mm		with bore	mm	mm	mm		
40/3		eShop	10	40	16	SO.. 1205..	219833 (15IP; 3.0 Nm)
50/5		eShop	10	40	22	SO.. 1205..	219833 (15IP; 3.0 Nm)
63/6		eShop	10	40	22	SO.. 1205..	219833 (15IP; 3.0 Nm)
80/8		eShop	10	50	27	SO.. 1205..	219833 (15IP; 3.0 Nm)
100/10		eShop	10	50	32	SO.. 1205..	219833 (15IP; 3.0 Nm)
125/12		eShop	10	63	40	SO.. 1205..	219833 (15IP; 3.0 Nm)
160/14		eShop	10	63	40	SO.. 1205..	219833 (15IP; 3.0 Nm)

Garant Milling inserts SO.T 1205.. and XOEW for GARANT Softcut® HSI No. 214848 – 214857

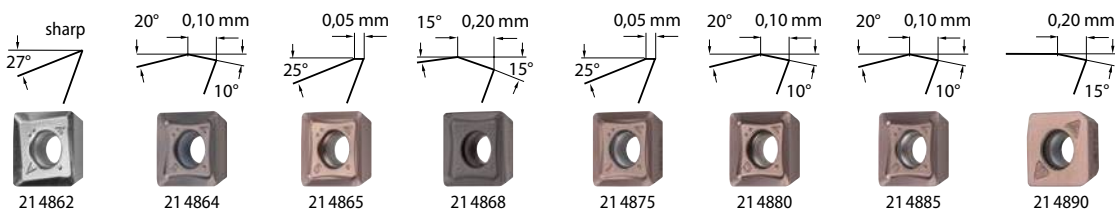
Increased insert thickness for the highest metal removal rates.
Protected against wear by the latest coating.

21 4864 – Cermet.

Note: Standard application values for $a_e = 0.3 \times D$.

21 4890 – Length of the wiper flat 6.5 mm.

Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
21 4860/4862	700	700	650																				
21 4864				270	260	210								100									
21 4865/4866				320	300	260																	
21 4867/4868							240	180															
21 4870							160	130															
21 4874–21 4878														120	100								
21 4880																	200						
21 4884/4885				260	240	190	120	110						90	70								



Type	ALU	ST500	ST900	ST1400	INOX	GGG	UNI	
21A 21 4860 SOET 120504 PDER HU7810 eShop	–	–	–	–	–	–	–	10
21A 21 4862 SOET 120508 PDER HU7810 eShop	–	–	–	–	–	–	–	10
21A 21 4864 SOMT 120508 PDER CU7530	–	eShop	–	–	–	–	–	10
21A 21 4866 SOMT 120504 PDER HB7520	–	–	eShop	–	–	–	–	10
21A 21 4865 SOMT 120508 PDER HB7520	–	–	eShop	–	–	–	–	10
21A 21 4867 SOMT 120504 PDER HB7510	–	–	–	eShop	–	–	–	10
21A 21 4868 SOMT 120508 PDER HB7510	–	–	–	eShop	–	–	–	10
21A 21 4870 SOMT 120508 PDER HB7520	–	–	–	eShop	–	–	–	10
21A 21 4874 SOMT 120504 PDER HB7630	–	–	–	–	eShop	–	–	10
21A 21 4875 SOMT 120508 PDER HB7630	–	–	–	–	eShop	–	–	10
21A 21 4877 SOMT 120504 PDER HB8630	–	–	–	–	eShop	–	–	10
21A 21 4878 SOMT 120508 PDER HB8630	–	–	–	–	eShop	–	–	10
21A 21 4880 SOMT 120508 PDER HB7730	–	–	–	–	–	eShop	–	10
21A 21 4884 SOMT 120504 PDER HB7520	–	–	–	–	–	–	eShop	10
21A 21 4885 SOMT 120508 PDER HB7520	–	–	–	–	–	–	eShop	10
21A 21 4890 XOEW 120508 PDER-W Wiper edge insert HB7730	–	–	–	–	–	–	eShop	10
f_z	mm	0.2	0.2	0.2	0.22	0.17	0.2	–

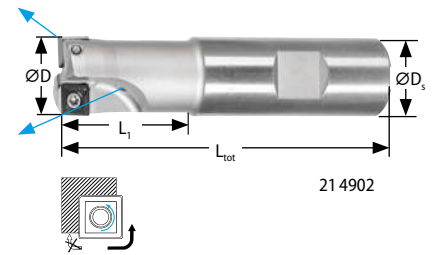


Garant GARANT Softcut® HSI for milling inserts SO.T 0836.. and XOEW

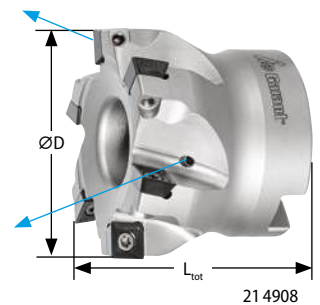
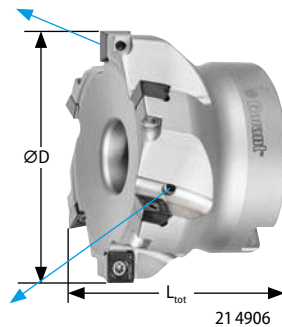
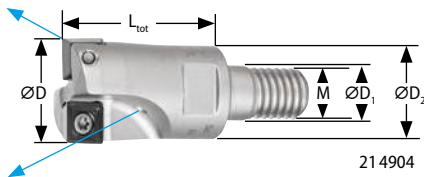
Wear-resistant heat-treated steel with corrosion-inhibiting coating. Precise indexable insert seating by use of appropriate torque. Wide and close tooth pitches for individual milling strategies.

Application: Particularly suitable for machines with lower drive power and for machining at greater depths and small entry diameters.

Note: For exact 90° corners, select $a_p = 6$ mm.
To use all 4 cutting edges, the insert must **always be turned in the direction shown (anticlockwise)**.
Use GARANT torque screwdriver TQ No. 211750 size 2.2 with bit No. 674252 size 8IP.



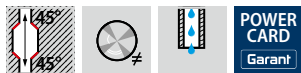
Ø D / number of teeth Z	21 4902	maximum cutting depth $a_{p\max}$	L_1	L_{tot}	Ø D ₁ h6	suitable indexable insert	Set of insert screws
	GARANT Softcut HSI						
mm	Weldon shank	mm	mm	mm	mm		
20/2	eShop	6	35	85	20	SO.. 0836..	219863 (8IP; 2.2 Nm)
25/3	eShop	6	39	95	25	SO.. 0836..	219863 (8IP; 2.2 Nm)
32/4	eShop	6	45	105	32	SO.. 0836..	219863 (8IP; 2.2 Nm)



Ø D / number of teeth Z	21 4904	maximum cutting depth $a_{p\max}$	Ø D ₁ h6	L_{tot}	Ø D ₂	Mounting thread M	suitable indexable insert	Set of insert screws
	GARANT Softcut HSI							
mm	with threaded shank	mm	mm	mm	mm			
20/2	eShop	6	10.5	30	17.7	M10	SO.. 0836..	219863 (8IP; 2.2 Nm)
25/3	eShop	6	12.5	35	20.7	M12	SO.. 0836..	219863 (8IP; 2.2 Nm)
32/4	eShop	6	17	40	28.7	M16	SO.. 0836..	219863 (8IP; 2.2 Nm)
40/5	eShop	6	17	40	28.7	M16	SO.. 0836..	219863 (8IP; 2.2 Nm)

Ø D / number of teeth Z	21 4906	maximum cutting depth $a_{p\max}$	L_{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
	GARANT Softcut HSI wide pitch					
mm	with bore	mm	mm	mm		
40/4	eShop	6	40	16	SO.. 0836..	219863 (8IP; 2.2 Nm)
50/5	eShop	6	40	22	SO.. 0836..	219863 (8IP; 2.2 Nm)
63/6	eShop	6	40	22	SO.. 0836..	219863 (8IP; 2.2 Nm)
80/7	eShop	6	50	27	SO.. 0836..	219863 (8IP; 2.2 Nm)
100/8	eShop	6	50	32	SO.. 0836..	219863 (8IP; 2.2 Nm)

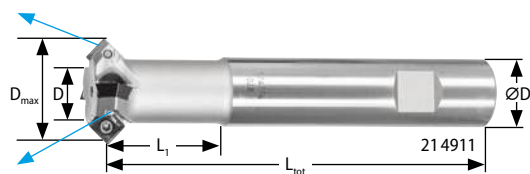
Ø D / number of teeth Z	21 4908	maximum cutting depth $a_{p\max}$	L_{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
	GARANT Softcut HSI close pitch					
mm	with bore	mm	mm	mm		
40/5	eShop	6	40	16	SO.. 0836..	219863 (8IP; 2.2 Nm)
50/6	eShop	6	40	22	SO.. 0836..	219863 (8IP; 2.2 Nm)
63/7	eShop	6	40	22	SO.. 0836..	219863 (8IP; 2.2 Nm)
80/8	eShop	6	50	27	SO.. 0836..	219863 (8IP; 2.2 Nm)
100/10	eShop	6	50	32	SO.. 0836..	219863 (8IP; 2.2 Nm)



Garant GARANT Softcut® HSI 45° indexable chamfer mill for SO.T0836..

Very high performance milling tool for forwards and reverse machining.

Note: D_{max} for use with indexable inserts $r = 0.4$ mm.
Use GARANT torque screwdriver TQ No. **211750** size **2.2** with bit No. **674252** size **8IP**.



Ø D / number of effective cutting edges Z	210	214911	Number of cutting edges Z	Ø D	Ø D _{max}	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Set of insert screws
mm		Weldon shank		mm	mm	mm	mm	mm		
16/3		eShop	3	16	26.3	35	110	16	SO.T 0836..	219863 (8IP; 2.2 Nm)
20/4		eShop	4	20	30.3	40	120	20	SO.T 0836..	219863 (8IP; 2.2 Nm)
25/5		eShop	5	25	35.1	45	130	25	SO.T 0836..	219863 (8IP; 2.2 Nm)

Garant Milling inserts SO.T 0836.. and XOEW for GARANT Softcut® HSI No. 214902 / 4904 / 4906 / 4908 / 4911

Increased insert thickness permits markedly deep trough geometry for positive cutting action, and minimises the susceptibility to fracture.

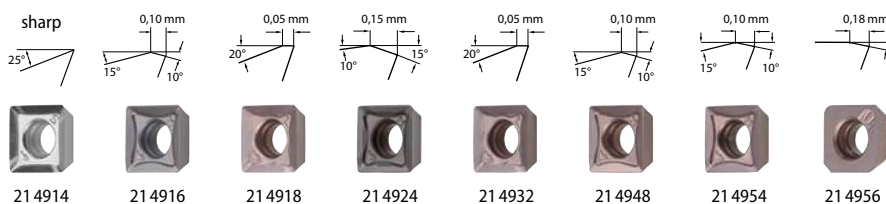
Tool material:

214916 – Cermet.

Note: Standard application values for $a_e = 0.3 \times D$.

214956 – Length of the flat chamfer 3.4 mm.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
214914	700	700	650																				
214916				270	220	180																	
214918				320	250	210																	
214924/4925							220	180															
214928/4929							180	140															
214932-214937														150	120								
214948																	200						
214954/4955				260	240	190	120	110						90	70								



Type	ALU	ST500	ST900	ST1400	INOX	GGG	UNI	
21A 214914 SOET 083604 PDER HU7810	eShop	—	—	—	—	—	—	10
21A 214916 SOMT 083604 PDER CU7530	—	eShop	—	—	—	—	—	10
21A 214918 SOMT 083604 PDER HB7520	—	—	eShop	—	—	—	—	10
21A 214924 SOMT 083608 PDER HB7510	—	—	—	eShop	—	—	—	10
21A 214925 SOMT 083608 PDER HB7510	—	—	—	eShop	—	—	—	10
21A 214928 SOMT 083604 PDER HB7520	—	—	—	eShop	—	—	—	10
21A 214929 SOMT 083608 PDER HB7520	—	—	—	eShop	—	—	—	10
21A 214932 SOMT 083604 PDER HB7630	—	—	—	—	eShop	—	—	10
21A 214933 SOMT 083608 PDER HB7630	—	—	—	—	eShop	—	—	10
21A 214935 SOMT 083604 PDER HB8630	—	—	—	—	eShop	—	—	10
21A 214937 SOMT 083608 PDER HB8630	—	—	—	—	eShop	—	—	10
21A 214948 SOMT 083604 PDER HB7730	—	—	—	—	—	eShop	—	10
21A 214954 SOMT 083608 PDER HB7520	—	—	—	—	—	—	eShop	10
21A 214955 SOMT 083608 PDER HB7520	—	—	—	—	—	—	eShop	10
21A 214956 XOEW 0836 PDER-W Wiper edge insert HB7730	—	—	—	—	—	—	eShop	10
f _z	mm	0.15	0.12	0.15	0.17	0.15	—	



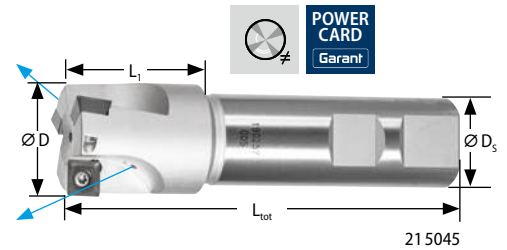
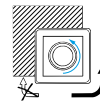
Indexable face / shoulder mill 90° for indexable inserts SOMT 09T304

Made of hardened special steel for low vibration and long life. Very good surface finishes are obtained due to projecting flat cutting edge.

Attention:

21 5055 – Without a PowerCard!

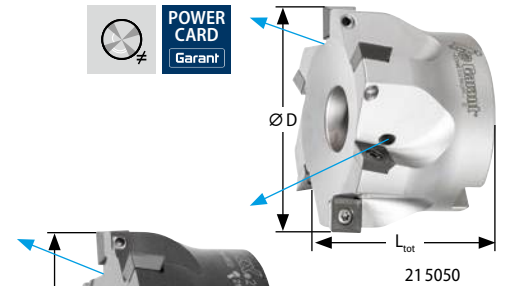
Note: To use all **4 cutting edges**, the insert **always has to be turned in the indicated direction**.
Use GARANT torque screwdriver TQ No. **211750 size 2.2** with bit No. **674252 size 9IP**.



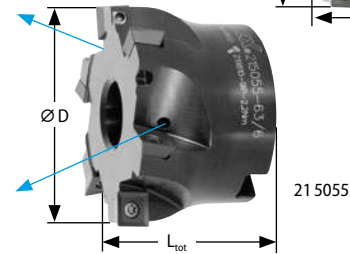
21 5045

Ø D / number of teeth Z	210	21 5045	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Set of insert screws
		Garant					
		Indexable face / shoulder mill 90°					
mm		Weldon shank	mm	mm	mm		
25/2		eShop	31	105	25	SOMT 09T304	219810 (9IP; 2.2 Nm)
32/3		eShop	41	110	25	SOMT 09T304	219810 (9IP; 2.2 Nm)

Ø D / number of teeth Z	210	21 5050	220	21 5055	L _{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
		Garant		HOLEX				
		Indexable face / shoulder mill 90°						
mm		with bore	with bore		mm	mm		
40/4		eShop	eShop		40	16	SOMT 09T304	219810 (9IP; 2.2 Nm)
50/5		eShop	eShop		40	22	SOMT 09T304	219810 (9IP; 2.2 Nm)
63/6		eShop	eShop		40	22	SOMT 09T304	219810 (9IP; 2.2 Nm)
80/6		eShop	eShop		50	27	SOMT 09T304	219810 (9IP; 2.2 Nm)
100/8		eShop	eShop		50	32	SOMT 09T304	219810 (9IP; 2.2 Nm)



21 5050



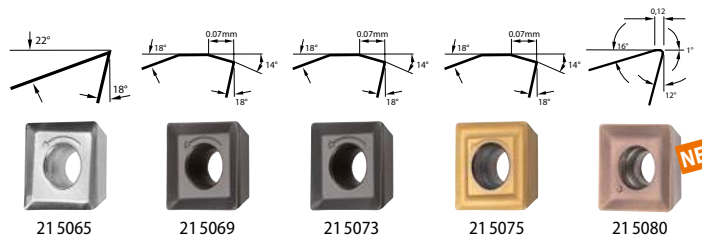
21 5055

Milling inserts SOMT 09T304 for indexable face / shoulder mills No. 215045 / 215050 / 215055

Extremely **strong inserts** to the standard ISO dimensions, precision sintered and ground. High strength and wear resistance due to micro-grain structure.

Note: Standard application values for $a_e = 0.3 \times D / a_{p \max} = 5 \text{ mm}$.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	ISO P	ISO P	ISO P	ISO P	ISO P	ISO H	ISO H	ISO H	INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni	Oil	Water	Chip	Chip	Chip
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
21 5065	780	700	610													480							
21 5066	780	780	780																				
21 5068				250	180	170	110					120	100										
21 5069				360	250	210	200	180				230	140		160								
21 5073				400	280	235	220	205				290	180		180								
21 5075				270	190	160	150	140				190	120		120								
21 5078				320	215	180	170	160				210	140	40	140								
21 5080				280	210	180	160	140				180	140										



Type	ALU	ST900	ST1400	INOX	UNI	
21A 21 5065	SOMT 09T304 FR	HU7710	eShop	—	—	10
21B 21 5066	SOMT 09T304 FR diamond-coated	HB7810	eShop	—	—	1
21A 21 5068		HB7525	—	eShop	—	10
21A 21 5069	Garant	HB7525	—	eShop	—	10
21A 21 5073	SOMT 09T304 TR	HB7515	—	eShop	—	10
21A 21 5075		HB7635	—	—	eShop	10
21A 21 5078		HB735	—	—	eShop	10
22A 21 5080	HOLEX	SOMT 09T304 ER	HBM025	—	eShop	10
Corner radius	mm		0.4			
f _z	mm	0.13	0.14	0.12	0.11	—



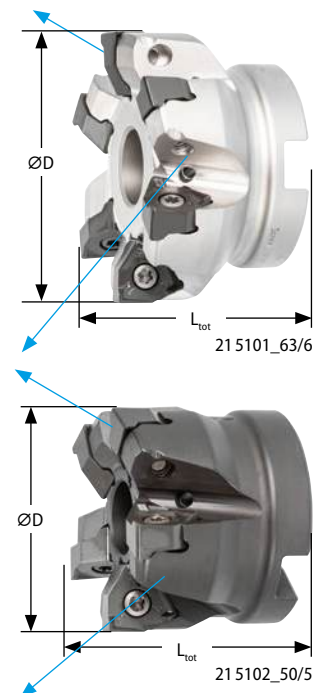
Shoulder mill 90° for inserts XNEX0806..

Robust shoulder milling cutter. Insert seats enclose the inserts on several sides for stable machining conditions.
For use in combination with indexable insert 215117 UNI as a **high feed rate indexable face mill**.

Application: With double-sided 3-edge inserts XNEX0806.. or single-sided 3-edge inserts XNEX0806.. **High feed rate.**

Note: GARANT torque screwdriver TQ No. **211750 size 3.8** with bit No. **674252 size 15IP**.

Ø D / number of teeth Z	210 21 5101	220 21 5102	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
	Garant	HOLEX					
	Shoulder mill 90°						
mm	with bore	with bore	mm	mm	mm		
40/4	eShop	eShop	4	40	16	XNEX 0806..	219798 1 (15IP; 3.8 Nm)
50/5	eShop	eShop	4	40	22	XNEX 0806..	219798 1 (15IP; 3.8 Nm)
63/6	eShop	eShop	4	40	22	XNEX 0806..	219798 1 (15IP; 3.8 Nm)
80/7	eShop	eShop	4	50	27	XNEX 0806..	219798 1 (15IP; 3.8 Nm)
100/8	eShop	eShop	4	50	32	XNEX 0806..	219798 1 (15IP; 3.8 Nm)



Milling inserts XNEX 0806.. for shoulder mill No. 215101 - 215102

6 edges ensure good value for money, due to a low price per cutting edge.

215184 – 215112 – Double-sided 2x3-edge carbide indexable insert for **shoulder milling operations**.

215117 – Single-sided 3-edge carbide indexable insert with special **geometry for high feed rates**.

Programming radius at $a_{p \max}$ of 2.4 mm.

Note: Standard application values for $a_e = 0.3 \times D / a_p = 3 \text{ mm}$.

215117 – $a_e = 0.6 \times D / a_p = 0.8 \text{ mm}$.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si												INOX	INOX	Ti	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K						
215104	1100	1100	900																					
215106						250	220	200																
215108															160	120								
215112/5117				280	240	220	200	180							120	95								
215184	1320	1320	1100																					
215185				335	300	280																		
215186						270	250	230																
215188																								
215190						240	200	180							190	130								
215192				300	260	240	220	200							140	110			290					



215184



215185



215186



215188



215190



215192



215117

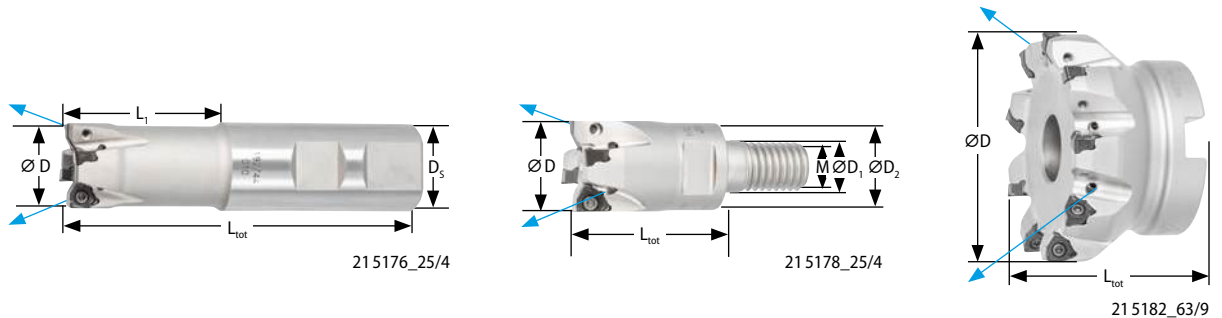
Type		ALU	ST900	ST1400	INOX	GGG	UNI		$a_{p \max}$ mm
21A 21 5184	Garant	HU7710	eShop	–	–	–	–	10	4
22A 21 5104	HOLEX	HUM310	eShop	–	–	–	–	10	4
21A 21 5185	Garant	HB7525	–	eShop	–	–	–	10	4
21A 21 5186	Garant	HB7515	–	–	eShop	–	–	10	4
22A 21 5106	HOLEX	HBM015	–	–	eShop	–	–	10	4
21A 21 5188	Garant	HB7635	–	–	–	eShop	–	10	4
22A 21 5108	HOLEX	HBM130	–	–	–	eShop	–	10	4
21A 21 5190	Garant	HB7710	–	–	–	–	eShop	10	4
21A 21 5192	Garant	HB735	–	–	–	–	eShop	10	4
22A 21 5112	HOLEX	HBM20	–	–	–	–	eShop	10	4
22A 21 5117	HOLEX	HBM20	–	–	–	–	eShop	10	1
f_t (215184, 215104, 215185, 215186, 215106, 215108, 215190)		mm	0.15	0.18	0.21	0.12	0.23	–	
f_t (215188)		mm	–	–	–	0.13	–	–	



Garant Shoulder mill 90° for insert XNEX040308

The corner milling system for **steppless shoulder milling**. The compact insert size ensures **immense stability** with an extra-high number of cutting edges – resulting in **very high productivity**.

Note: Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 7IP**.



Ø D / number of teeth Z	210	21 5176	210	21 5177	maximum cutting depth $a_{p \max}$	L_1		L_{tot}		Ø D ₁ h6	suitable indexable insert	Set of insert screws
		Shoulder mill 90°										
mm		Weldon shank		Plain shank	mm	mm	mm	mm	mm	mm		
20/3		eShop		eShop	2	40	40	90	150	20	XNEX 040308	219878 1 (7IP; 1.2 Nm)
25/4		eShop		eShop	2	44	50	100	170	25	XNEX 040308	219878 1 (7IP; 1.2 Nm)
32/5		eShop		eShop	2	50	70	110	195	32	XNEX 040308	219878 1 (7IP; 1.2 Nm)

Ø D / number of teeth Z	210	21 5178	maximum cutting depth $a_{p \max}$	L_{tot}	Ø D ₁ h6	Ø D ₂	Mounting thread M	suitable indexable insert	Set of insert screws
		Shoulder mill 90°							
mm		with threaded shank	mm	mm	mm	mm			
20/3		eShop	2	30	10.5	17.7	M10	XNEX 040308	219878 1 (7IP; 1.2 Nm)
25/4		eShop	2	35	12.5	20.7	M12	XNEX 040308	219878 1 (7IP; 1.2 Nm)
32/5		eShop	2	40	17	28.7	M16	XNEX 040308	219878 1 (7IP; 1.2 Nm)

Ø D / number of teeth Z	210	21 5182	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
		Shoulder mill 90°					
mm		with bore	mm	mm	mm		
32/6		eShop	2	40	16	XNEX 040308	219878 1 (7IP; 1.2 Nm)
40/6		eShop	2	40	16	XNEX 040308	219878 1 (7IP; 1.2 Nm)
50/8		eShop	2	40	22	XNEX 040308	219878 1 (7IP; 1.2 Nm)
63/9		eShop	2	40	22	XNEX 040308	219878 1 (7IP; 1.2 Nm)

Garant Milling inserts XNEX040308 for shoulder mill No. 215176 - 215182

Double-sided 3-edged indexable inserts. High-performance tool materials for **extremely reliable processes**.

Note: Standard application values for $a_e = 0.3 \times D / a_p = 2\text{mm}$.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
215195				335	300	280	240	220												○	○	●	●
215198														190	130					○	○	●	●
215199				300	260	240	220	200						140	110			●		●	●	●	●



Type			ST900	INOX	UNI		$a_{p \max}$ mm
21A 215195	XNEX 040308	HB7525	eShop	—	—	10	2
21A 215198		HB7635	—	eShop	—	10	2
21A 215199		HB735	—	—	eShop	10	2
f_z		mm	0.12	0.1	—		



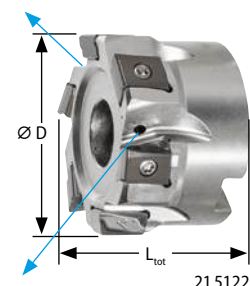
Garant GARANT Power Tang 90° tangential high-performance shoulder mill for LO.U1307...

Maximum stability due to tangentially arranged inserts. High feed rate values for maximum metal removal rate due to optimum indexable insert with stability in the direction of the cutting force.

Note: Use GARANT torque screwdriver TQ No. **211750 size 3.0** with bit No. **674252 size 15IP**.

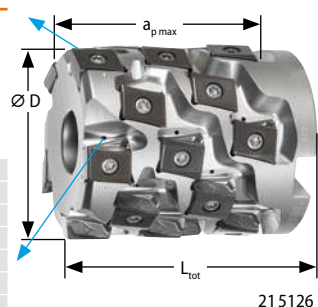
Single-row

Ø D / number of effective cutting edges Z	210	21 5122	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore Ø	Set of insert screws
		GARANT Power Tang 90° tangential high-performance shoulder mill				
mm		with bore	mm	mm	mm	
40/4		eShop	12	40	16	219882 (15IP; 3.0 Nm)
40/5		eShop	12	40	16	219882 (15IP; 3.0 Nm)
50/5		eShop	12	40	22	219882 (15IP; 3.0 Nm)
50/6		eShop	12	40	22	219882 (15IP; 3.0 Nm)
63/6		eShop	12	40	27	219882 (15IP; 3.0 Nm)
63/8		eShop	12	40	27	219882 (15IP; 3.0 Nm)
80/7		eShop	12	50	27	219882 (15IP; 3.0 Nm)
80/10		eShop	12	50	27	219882 (15IP; 3.0 Nm)
100/9		eShop	12	50	32	219882 (15IP; 3.0 Nm)
100/12		eShop	12	50	32	219882 (15IP; 3.0 Nm)
125/12		eShop	12	63	40	219882 (15IP; 3.0 Nm)
125/15		eShop	12	63	40	219882 (15IP; 3.0 Nm)



Multi-row

Ø D / Z _{eff}	210	21 5126	Number of effective inserts Z _{eff}	Number of indexable inserts	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore Ø	Set of insert screws
		GARANT Power Tang 90° tangential high-performance shoulder mill						
mm		with bore			mm	mm	mm	
50/3		eShop	3	12	47	70	27	219882 (15IP; 3.0 Nm)
50/4		eShop	4	20	59	80	27	219882 (15IP; 3.0 Nm)
63/4		eShop	4	16	47	65	27	219882 (15IP; 3.0 Nm)
63/4L		eShop	4	28	81	93	27	219882 (15IP; 3.0 Nm)
63/5		eShop	5	25	59	75	27	219882 (15IP; 3.0 Nm)
80/5		eShop	5	30	70	90	32	219882 (15IP; 3.0 Nm)
100/6		eShop	6	42	81	93	40	219882 (15IP; 3.0 Nm)



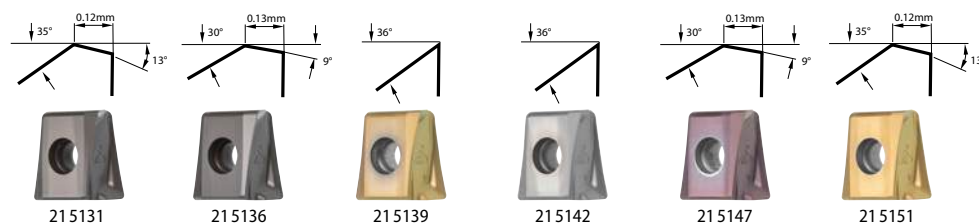
Garant Milling inserts LO.U130708.. for GARANT Power Tang No. 215122 / 215126

Note:

21 5131/5133/5147/5151 – Standard application values for $a_e = 0.3 \times D$ / $a_p = 10$ mm

21 5136–5142 – Standard application values for $a_e = 0.3 \times D$ / $a_p = 8$ mm

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	Y	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K			
21 5131				255	190	160	130	90							100	85					
21 5133				190	150	125	135	95	45								250				
21 5136															120	95	45				
21 5139															130	105	50				
21 5142																		300			
21 5147																		200			
21 5151				200	160	130	100	70							110	90	40				



Type		ST900	ST1400	INOX	TI	GG	UNI	
21A 21 5131	LOEU 130708 TR-M	HB7525	eShop	–	–	–	–	10
21A 21 5133	LOMU 130708 TR-M	HB9520	eShop	–	–	–	–	10
21A 21 5136	LOEU 130708 TR-H	HB7515	–	eShop	–	–	–	10
21A 21 5139	LOEU 130708 R-L	HB7635	–	–	eShop	–	–	10
21A 21 5142		HB7940	–	–	–	eShop	–	10
21A 21 5147	LOEU 130708 TR-H	HB7710	–	–	–	eShop	–	10
21A 21 5151	LOEU 130708 TR-M	HB735	–	–	–	–	eShop	10
f _z	mm	0.2	0.22	0.14	0.12	0.24	–	



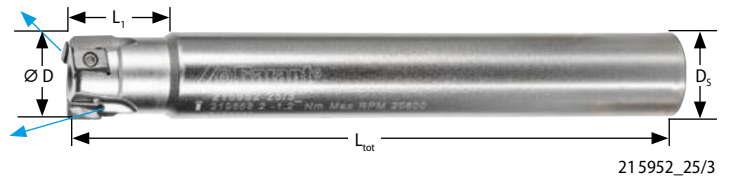
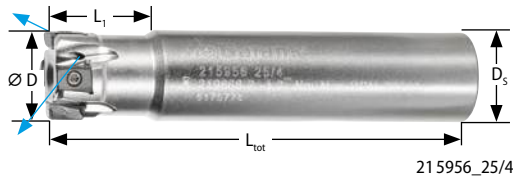
Garant GARANT Power Tang 90° tangential high-performance shoulder mill for LO.U0904...

Single-row

Maximum stability due to tangentially arranged inserts.

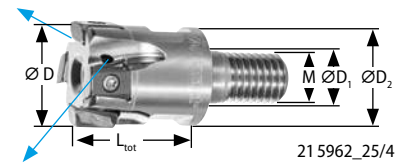
High feed rate values for maximum metal removal rate due to optimum indexable insert with stability in the direction of the cutting force.

Note: Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

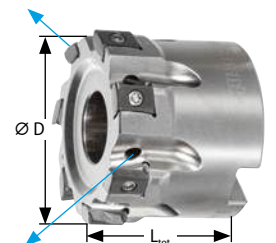


Ø D / number of effective cutting edges Z	210	21 5950		210	21 5952		maximum cutting depth a _p max	L ₁		L _{tot}		Ø D _s h6	Set of insert screws
	GARANT Power Tang 90° tangential high-performance shoulder mill												
	wide pitch												
mm	Weldon shank		Plain shank		mm	mm	21 5950 mm	21 5952 mm	mm				
20/2	eShop		eShop		8	30	101	160	20	219868 2 (8IP; 1.2 Nm)			
25/3	eShop		eShop		8	30	105	180	25	219868 2 (8IP; 1.2 Nm)			
32/3	eShop		eShop		8	30	105	200	32	219868 2 (8IP; 1.2 Nm)			

Ø D / number of effective cutting edges Z	210	21 5954		210	21 5956		maximum cutting depth a _p max	L ₁		L _{tot}		Ø D _s h6	Set of insert screws
	GARANT Power Tang 90° tangential high-performance shoulder mill												
	close pitch												
mm	Weldon shank		Plain shank		mm	21 5954 mm	21 5956 mm	21 5954 mm	21 5956 mm	mm			
16/2	eShop		eShop		8	25	30	78	90	16	219868 1 (8IP; 1.2 Nm)		
20/3	eShop		eShop		8	30	30	90	110	20	219868 2 (8IP; 1.2 Nm)		
25/4	eShop		eShop		8	30	30	105	120	25	219868 2 (8IP; 1.2 Nm)		
32/5	eShop		eShop		8	30	30	105	130	32	219868 2 (8IP; 1.2 Nm)		



Ø D / number of effective cutting edges Z	210	21 5960	210	21 5962	maximum cutting depth a _p max	L _{tot}	Ø D ₁ h6	Ø D ₂	Mounting thread M	Set of insert screws
	GARANT PowerTang 90° tangential high-performance shoulder mill									
	wide pitch with threaded shank		close pitch with threaded shank							
mm					mm	mm	mm	mm		
16/2		—		eShop	8	23	8.5	13.5	M8	219868 1 (8IP; 1.2 Nm)
20/2		eShop		—	8	28	10.5	18.5	M10	219868 2 (8IP; 1.2 Nm)
20/3		—		eShop	8	28	10.5	18.5	M10	219868 2 (8IP; 1.2 Nm)
25/3		eShop		—	8	30	12.5	23	M12	219868 2 (8IP; 1.2 Nm)
25/4		—		eShop	8	30	12.5	23	M12	219868 2 (8IP; 1.2 Nm)
32/3		eShop		—	8	35	17	30	M16	219868 2 (8IP; 1.2 Nm)
32/5		—		eShop	8	35	17	30	M16	219868 2 (8IP; 1.2 Nm)



Ø D / number of effective cutting edges Z	210	21 5966	210	21 5968	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø	Set of insert screws
	GARANT PowerTang 90° tangential high-performance shoulder mill							
	wide pitch with bore		close pitch with bore					
mm					mm	mm	mm	
40/4		eShop		—	8	40	16	219868 2 (8IP; 1.2 Nm)
40/6		—		eShop	8	40	16	219868 2 (8IP; 1.2 Nm)
50/5		eShop		—	8	40	22	219868 2 (8IP; 1.2 Nm)
50/7		—		eShop	8	40	22	219868 2 (8IP; 1.2 Nm)
63/7		eShop		—	8	40	27	219868 2 (8IP; 1.2 Nm)
63/9		—		eShop	8	40	27	219868 2 (8IP; 1.2 Nm)

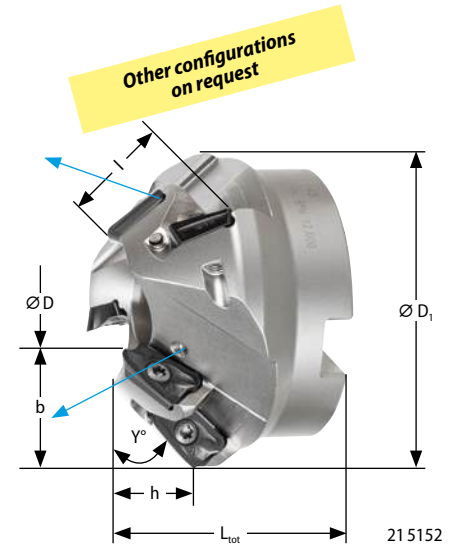


Garant GARANT Softcut® high-performance indexable chamfer mill for APT 1805..

Robust plug-in chamfer mill. Insert seat enclosed on several sides for stabilisation of the cutters and to take up the vertical and radial forces.

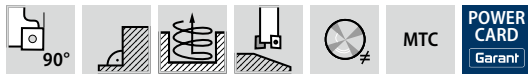
Application: For wide chamfers in steel fabrications.
Outstandingly suitable for roughing and semi-roughing applications.

Note: Stepless surfaces are achieved.
Use GARANT torque screwdriver TQ No. **211750 size 3.8** with bit No. **674252 size 15IP**.



γ°	75	60	45	30	15
Correction factor fz	1	1.2	1.4	2	3.5

Angle γ	210	21 5152	Number of effective inserts Z_{eff}	Number of indexable inserts	L_{tot}	smallest Ø D	largest Ø D ₁	achievable chamfer width b	achievable chamfer length l	achievable chamfer height h	Mounting bore Ø	Feed rate per tooth at h_{max}	Set of insert screws
		GARANT Softcut chamfer mill											
		MTC with bore			mm	mm	mm	mm	mm	mm	mm	mm	
degrees													
15		eShop	3	6	50	35	92	27.8	29.5	7.5	27	0.4	219808 (15IP; 3.8 Nm)
30		eShop	3	6	50	35	85	24.3	29.5	14	27	0.2	219808 (15IP; 3.8 Nm)
45		eShop	3	6	50	35	76	20	29.5	20	27	0.14	219808 (15IP; 3.8 Nm)
60		eShop	3	6	50	35	64	14	29.5	24.3	27	0.12	219808 (15IP; 3.8 Nm)
75		eShop	3	6	60	35	50	7.5	29.5	27.8	22	0.11	219808 (15IP; 3.8 Nm)



Garant GARANT Softcut® high-performance indexable shoulder mill 90° MTC for indexable inserts APT 1805..

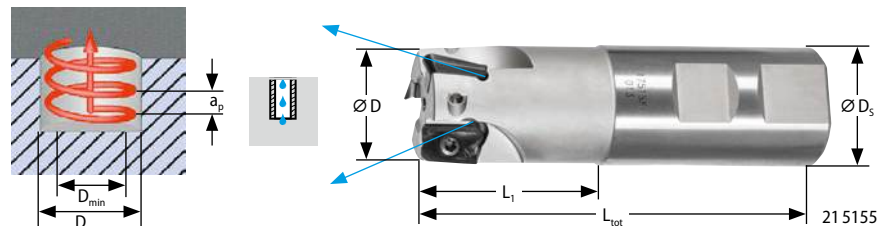
High precision square shoulder milling cutter with irregular pitch for very smooth cutting, very high precision and cutting power. High performance indexable square shoulder milling cutter **with special geometry for reduced cutting forces for MTC applications** under **unstable conditions** or **for spindles with low drive power**.

Application: For face milling to large depths, also slotting.
General use in all steels including stainless steels.
Especially for **MTC (Multi Task Cutting)** use on the new generation of turning / milling centres (**MTM**).

Note: The insert pocket must be modified when using indexable inserts with a radius greater than 3.1 mm.
Use GARANT torque screwdriver TQ No. **211750 size 3.8** with bit No. **674252 size 15IP**.

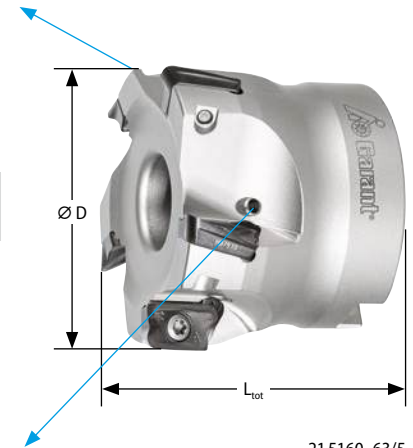
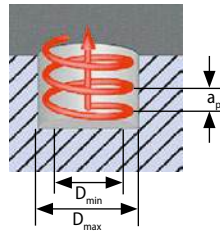
Single-row

21 5157 – Without internal cooling.



Ø D / number of teeth Z	210	21 5155	210	21 5157	L ₁		L _{tot}		Ø D _s h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
	GARANT Softcut 90° shoulder mill															
	MTC short		MTC long													
	Weldon shank		Plain shank													
mm					21 5155	21 5157	21 5155	21 5157					degrees	mm		
25/2		eShop		eShop	44	45	100	200	25	44	48	1	1.69	16.95	AP.. 1805..	219824 (15IP; 3.8 Nm)
32/3		eShop		eShop	50	50	110	250	32	58	62	1	1.2	23.95	AP.. 1805..	219824 (15IP; 3.8 Nm)
40/4		eShop		—	55	—	115	—	32	74	78	1	0.9	31.95	AP.. 1805..	219808 (15IP; 3.8 Nm)

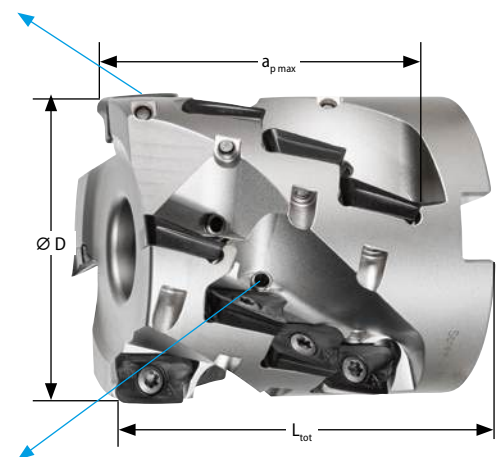
Size 160/10 – For arbors to DIN 2079, with 4 additional attachment holes.
Without internal cooling.



21 5160_63/5

Ø D / number of teeth Z	210	21 5160	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}	suitable indexable insert	Set of insert screws
		GARANT Softcut 90° shoulder mill									
mm		MTC with bore	mm	mm	mm	mm	mm	degrees	mm		
40/3		eShop	40	16	74	78	1	0.9	31.95	AP. 1805..	219808 (15IP; 3.8 Nm)
40/4		eShop	40	16	74	78	1	0.9	31.95	AP. 1805..	219808 (15IP; 3.8 Nm)
50/4		eShop	40	22	94	98	0.9	0.68	41.95	AP. 1805..	219808 (15IP; 3.8 Nm)
50/5		eShop	40	22	94	98	0.9	0.68	41.95	AP. 1805..	219808 (15IP; 3.8 Nm)
52/5		eShop	40	22	98	102	0.9	0.65	43.95	AP. 1805..	219808 (15IP; 3.8 Nm)
63/5		eShop	50	27	120	124	0.8	0.52	54.95	AP. 1805..	219808 (15IP; 3.8 Nm)
63/6		eShop	50	27	120	124	0.8	0.52	54.95	AP. 1805..	219808 (15IP; 3.8 Nm)
66/6		eShop	50	27	126	130	0.8	0.49	57.95	AP. 1805..	219808 (15IP; 3.8 Nm)
80/6		eShop	50	27	154	158	0.8	0.4	71.95	AP. 1805..	219808 (15IP; 3.8 Nm)
80/7		eShop	50	27	154	158	0.8	0.4	71.95	AP. 1805..	219808 (15IP; 3.8 Nm)
100/7		eShop	50	32	194	198	0.85	0.31	91.95	AP. 1805..	219808 (15IP; 3.8 Nm)
100/8		eShop	50	32	194	198	0.85	0.31	91.95	AP. 1805..	219808 (15IP; 3.8 Nm)
125/8		eShop	63	40	244	248	0.85	0.24	116.95	AP. 1805..	219808 (15IP; 3.8 Nm)
125/9		eShop	63	40	244	248	0.85	0.24	116.95	AP. 1805..	219808 (15IP; 3.8 Nm)
160/10		eShop	63	40	314	318	0.85	0.19	151.95	AP. 1805..	219808 (15IP; 3.8 Nm)

Multi-row



21 5161_63/4

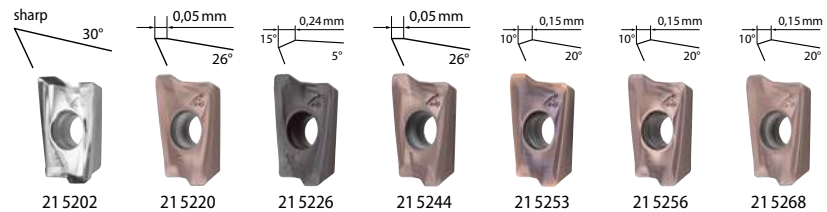
Ø D / Z _{eff}	210	21 5161	Number of effective inserts Z _{eff}	Number of indexable inserts	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø	Set of insert screws
		GARANT Softcut 90° shoulder mill						
mm		MTC with bore			mm	mm	mm	
50/3		eShop	3	12	55	72	22	219808 (15IP; 3.8 Nm)
50/4		eShop	4	8	28	50	22	219808 (15IP; 3.8 Nm)
63/4		eShop	4	16	55	72	27	219808 (15IP; 3.8 Nm)
63/5		eShop	5	10	28	50	27	219808 (15IP; 3.8 Nm)
80/5		eShop	5	20	55	82	32	219808 (15IP; 3.8 Nm)
80/6		eShop	6	12	28	50	32	219808 (15IP; 3.8 Nm)

Garant Milling inserts AP.T 1805.. for GARANT Softcut® milling cutters No. 215152 – 215161

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si										INOX	INOX	Ti	GG(G)	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	M	M	S	K	N							
21 5202–21 5212	600	500	400																				
21 5214	600	600	550														●						
21 5220				340	300	260																	
21 5223–21 5229							220	200															
21 5231–21 5242							170	150															
21 5243–21 5252/ 5255/5280–21 5285													170	130									
21 5253/5254															40								
21 5256/5257																250							
21 5262–21 5277				330	290	250							150	120				●					

Note:

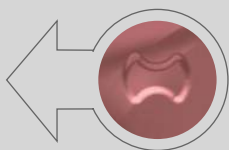
Standard application values for
 $a_e = 0.3 \times D / a_p = 5 \text{ mm}$, $a_{p \max} = 9 \text{ mm}$.



Type	ALU	ST900	ST1400	INOX	TI	GG	UNI	
21A 21 5202	APET 180505 FR	HU7810	eShop	–	–	–	–	10
21A 21 5208	APET 180508 FR	HU7810	eShop	–	–	–	–	10
21A 21 5210	APET 180520 FR	HU7810	eShop	–	–	–	–	10
21A 21 5211	APET 180531 FR	HU7810	eShop	–	–	–	–	10
21A 21 5212	APET 180540 FR	HU7810	eShop	–	–	–	–	10
21B 21 5214	APET 180508 FR diamond-coated	HB7810	eShop	–	–	–	–	1
21A 21 5220	APMT 180508 ER	HB7520	–	eShop	–	–	–	10
21A 21 5225	APMT 180504 SR	HB7510	–	–	eShop	–	–	10
21A 21 5226	APMT 180508 SR	HB7510	–	–	eShop	–	–	10
21A 21 5227	APMT 180512 SR	HB7510	–	–	eShop	–	–	10
21A 21 5223	APMT 180516 SR	HB7510	–	–	eShop	–	–	10
21A 21 5228	APMT 180520 SR	HB7510	–	–	eShop	–	–	10
21A 21 5224	APMT 180524 SR	HB7510	–	–	eShop	–	–	10
21A 21 5229	APMT 180531 SR	HB7510	–	–	eShop	–	–	10
21A 21 5231	APMT 180504 SR	HB7520	–	–	eShop	–	–	10
21A 21 5232	APMT 180508 SR	HB7520	–	–	eShop	–	–	10
21A 21 5238	APMT 180512 SR	HB7520	–	–	eShop	–	–	10
21A 21 5240	APMT 180516 SR	HB7520	–	–	eShop	–	–	10
21A 21 5239	APMT 180520 SR	HB7520	–	–	eShop	–	–	10
21A 21 5242	APMT 180524 SR	HB7520	–	–	eShop	–	–	10
21A 21 5241	APMT 180531 SR	HB7520	–	–	eShop	–	–	10
21A 21 5243	APMT 180504 ER	HB7630	–	–	–	eShop	–	10
21A 21 5244	APMT 180508 ER	HB7630	–	–	–	eShop	–	10
21A 21 5250	APMT 180512 ER	HB7630	–	–	–	eShop	–	10
21A 21 5251	APMT 180516 ER	HB7630	–	–	–	eShop	–	10
21A 21 5252	APMT 180520 ER	HB7630	–	–	–	eShop	–	10
21A 21 5255	APMT 180524 ER	HB7630	–	–	–	eShop	–	10
21A 21 5280	APMT 180504 ER	HB8630	–	–	–	eShop	–	10
21A 21 5281	APMT 180508 ER	HB8630	–	–	–	eShop	–	10
21A 21 5282	APMT 180512 ER	HB8630	–	–	–	eShop	–	10
21A 21 5283	APMT 180516 ER	HB8630	–	–	–	eShop	–	10
21A 21 5284	APMT 180520 ER	HB8630	–	–	–	eShop	–	10
21A 21 5285	APMT 180524 ER	HB8630	–	–	–	eShop	–	10
21A 21 5253	APMT 180508 ER	HB7930	–	–	–	eShop	–	10
21A 21 5254	APMT 180508 ER	HB7935	–	–	–	eShop	–	10
21A 21 5256	APMT 180508 ER	HB7730	–	–	–	–	eShop	10
21A 21 5257	APMT 180512 ER	HB7730	–	–	–	–	eShop	10
21A 21 5262	APMT 180508 TR	HB7520	–	–	–	–	eShop	10
21A 21 5268	APMT 180512 TR	HB7520	–	–	–	–	eShop	10
21A 21 5274	APMT 180516 TR	HB7520	–	–	–	–	eShop	10
21A 21 5275	APMT 180520 TR	HB7520	–	–	–	–	eShop	10
21A 21 5277	APMT 180524 TR	HB7520	–	–	–	–	eShop	10
21A 21 5276	APMT 180531 TR	HB7520	–	–	–	–	eShop	10
f _z	mm	0.2	0.15	0.25	0.2	0.17	0.2	–

Garant

GARANT SOFTCUT® 90° HIGH-PERFORMANCE SHOULDER MILL.



Marking indicating suitability for heavy-duty cutting.

Reliable and profitable

- Very good perpendicularity for shoulder cuts.
- Impressive surface quality.
- Suitable for circular interpolation milling, plunging, ramping.
- Optimised chip breaker geometry for machining tempered steels (21 5444 – 21 5453 ST1400).
- Highly positive surface geometry for a soft cut in all materials.
- First-rate innovative tool materials and coatings.

Application example

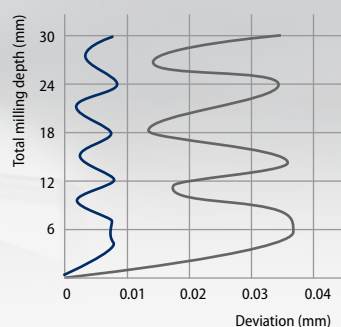
SIDE MILLING a workpiece, material C45

Technology data:

- $v_c = 160$ m/min
- $f_z = 0.15$ mm
- $a_p = 6$ mm
- $a_e = 3$ mm
- Tool: GARANT Softcut® 90° shoulder mill 21 5411 50/7
- Insert: GARANT Softcut® 90° 21 5438 ST900

90° accuracy – comparison

Test result with $a_p = 6$ mm (shoulder height 30 mm)



■ **GARANT Softcut® 90° 21 5438 ST900**
Step joint offset of less than 0.01 mm

■ **Competitors**
Step joint offset of up to 0.035 mm

Tool material selection

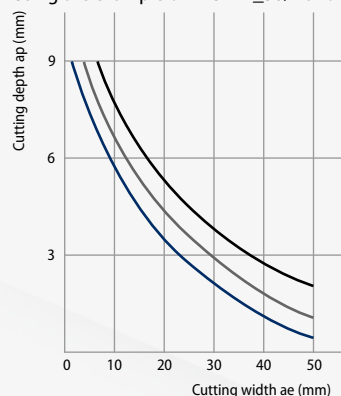
Carbide tool materials with PVD coating

	Finishing Medium machining	Medium machining	Roughing Heavy-duty machining
N	HU7810-1		
P	HB7510-1*	HB7830-1	HB7520-1
M	HB7830-1	HB8630	
K	HB7730-1		

* CVD-coated

Recommended cutting conditions for shoulder milling

Using the example of 21 5411_50/7 and chip breaker ST900



- $f_z = 0.05$ mm/z
- $f_z = 0.10$ mm/z
- $f_z = 0.15$ mm/z

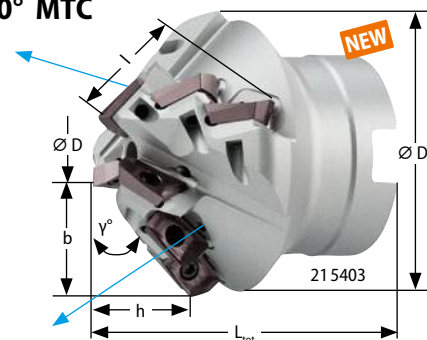


GARANT Softcut® high-performance indexable chamfer mill 90° MTC for AO.T1104..

Robust plug-in chamfer mill. Insert seat enclosed on several sides for stabilisation of the cutters and to take up the vertical and radial forces.

Application: For wide chamfers in steel fabrications.
Outstandingly suitable for roughing and semi-roughing applications.

Note: Stepless surfaces are achieved with indexable inserts No. 215431-215487.
Use GARANT torque screwdriver TQ No. **211750 size 1.5** with bit No. **674252 size 8IP**.



γ°	75	60	45	30	15
Correction factor fz	1	1.2	1.4	2	3.5

Angle γ	210 21 5403 GARANT Softcut indexable chamfer mill 90° MTC with bore	Number of effective inserts Z_{eff}	Number of indexable inserts	L_{tot}	smallest Ø D	largest Ø D ₁	achievable chamfer width b	achievable chamfer length l	achievable chamfer height h	Mounting bore Ø	Feed rate per tooth at h_{max}	Set of insert screws
degrees				mm	mm	mm	mm	mm	mm	mm	mm	
15	eShop	3	9	55	17	69	26.4	27.5	7	22	0.4	219799 10 (8IP; 1.5 Nm)
30	eShop	3	9	55	17	66	24.5	27.5	14	22	0.2	219799 10 (8IP; 1.5 Nm)
45	eShop	3	9	55	17	57	20.1	27.5	20	22	0.14	219799 10 (8IP; 1.5 Nm)
60	eShop	3	9	52	17	45	14.4	27.5	25	16	0.12	219799 10 (8IP; 1.5 Nm)
75	eShop	3	9	60	21	36	7.5	27.5	28	16	0.11	219799 10 (8IP; 1.5 Nm)



GARANT Softcut® high-performance indexable shoulder mill 90° MTC for AO.T1104..

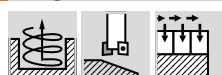
High precision square shoulder mill with irregular pitch for very smooth cutting, very high precision and cutting power.

With special geometry for reduced cutting forces for MTC applications under **unstable conditions** or for spindles with low drive power.

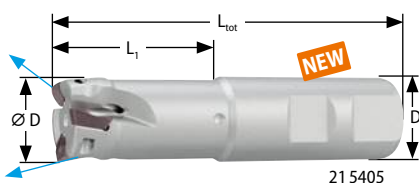
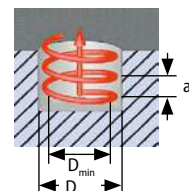
Application: For shoulder milling in large depths, also slotting. General use in all steel materials as well as stainless and acid-resistant steels.

Note: Use GARANT torque screwdriver TQ No. **211750 size 1.5**
with bit No. **674252 size 8IP**.

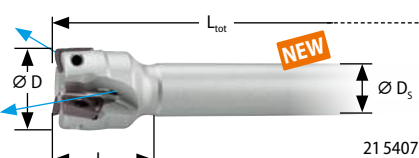
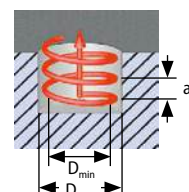
Single-row

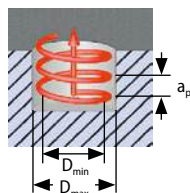


Ø D / number of effective cutting edges Z	210 21 5405 GARANT Softcut indexable shoulder mill 90° MTC Weldon shank	L_1	L_{tot}	Ø D ₃ h ₆	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a_p	Ramping angle α_{max}	Set of insert screws
mm		mm	mm	mm	mm	mm	mm	degrees	
14/1	eShop	37	85	16	19	25.3	5	8	219799 11 (8IP; 1.5 Nm)
16/2	eShop	37	100	16	21.7	29.3	7.6	10.5	219799 11 (8IP; 1.5 Nm)
18/2	eShop	40	90	20	25.2	33.3	6.7	8.1	219799 11 (8IP; 1.5 Nm)
20/2	eShop	40	90	20	29.1	37.3	6	6.5	219799 10 (8IP; 1.5 Nm)
20/3	eShop	40	90	20	29.1	37.3	6	6.5	219799 10 (8IP; 1.5 Nm)
25/3	eShop	49	105	25	38.9	47.3	4.8	4.1	219799 10 (8IP; 1.5 Nm)
25/4	eShop	49	105	25	38.9	47.3	4.8	4.1	219799 10 (8IP; 1.5 Nm)
32/5	eShop	50	110	32	52.8	61.3	4	2.7	219799 10 (8IP; 1.5 Nm)



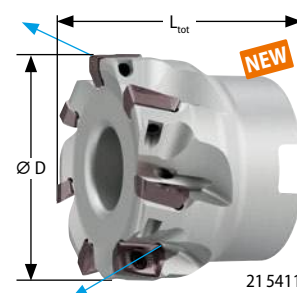
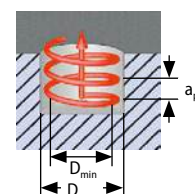
Ø D / number of effective cutting edges Z	210 21 5407 GARANT Softcut indexable shoulder mill 90° MTC Plain shank	L_1	L_{tot}	Ø D ₃ h ₆	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a_p	Ramping angle α_{max}	Set of insert screws
mm		mm	mm	mm	mm	mm	mm	degrees	
16/2	eShop	50	140	16	29	30	7.6	10.5	219799 11 (8IP; 1.5 Nm)
18/2	eShop	30	140	16	23	34	6.7	8.1	219799 11 (8IP; 1.5 Nm)
20/2L	eShop	30	160	18	37	38	6	6.5	219799 10 (8IP; 1.5 Nm)
20/2	eShop	50	160	20	37	38	6	6.5	219799 10 (8IP; 1.5 Nm)
20/3	eShop	25	160	16	37	38	6	6.5	219799 10 (8IP; 1.5 Nm)
25/2L	eShop	35	180	20	47	48	4.8	4.1	219799 10 (8IP; 1.5 Nm)
25/2	eShop	60	180	25	47	48	4.8	4.1	219799 10 (8IP; 1.5 Nm)
25/3	eShop	30	180	16	47	48	4.8	4.1	219799 10 (8IP; 1.5 Nm)
25/4	eShop	25	180	20	47	48	4.8	4.1	219799 10 (8IP; 1.5 Nm)





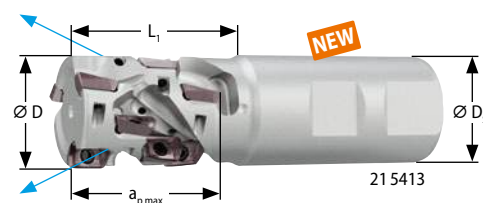
$\varnothing D$ / number of effective cutting edges Z	210 21 5409 GARANT Softcut indexable shoulder mill 90° MTC with threaded shank	L_{tot}	$\varnothing D_1$ h6	$\varnothing D_2$	Mounting thread M	Circular interpolation milling $\varnothing D_{min}$	Circular interpolation milling $\varnothing D_{max}$	Circular interpolation milling a_p	Ramping angle α_{max}	Set of insert screws
mm		mm	mm	mm		mm	mm	mm	degrees	
15,7/2	eShop	26	8.5	14.5	M8	21.1	28.7	7.6	10.5	219799 11 (8IP; 1.5 Nm)
16/2	eShop	26	8.5	14.5	M8	21.7	29.3	7.6	10.5	219799 11 (8IP; 1.5 Nm)
19,7/3	eShop	30	10.5	18	M10	28.5	36.7	6	6.5	219799 11 (8IP; 1.5 Nm)
20/3	eShop	30	10.5	18	M10	29.1	37.3	6	6.5	219799 10 (8IP; 1.5 Nm)
24,7/4	eShop	35	12.5	23	M12	38.3	46.7	4.8	4.1	219799 10 (8IP; 1.5 Nm)
25/3	eShop	35	12.5	23	M12	38.9	47.3	4.8	4.1	219799 10 (8IP; 1.5 Nm)
25/4	eShop	35	12.5	23	M12	38.9	47.3	4.8	4.1	219799 10 (8IP; 1.5 Nm)
32/4	eShop	40	17	28.5	M16	52.8	61.3	4	2.7	219799 10 (8IP; 1.5 Nm)
32/5	eShop	40	17	28.5	M16	52.8	61.3	4	2.7	219799 10 (8IP; 1.5 Nm)

$\varnothing D$ / number of effective cutting edges Z	210 21 5411 GARANT Softcut indexable shoulder mill 90° MTC with bore	L_{tot}	Mounting bore $\varnothing$	Circular interpolation milling $\varnothing D_{min}$	Circular interpolation milling $\varnothing D_{max}$	Circular interpolation milling a_p	Ramping angle α_{max}	Set of insert screws
mm		mm	mm	mm	mm	mm	degrees	
40/4	eShop	40	16	68.8	77.3	3.4	1.8	219799 10 (8IP; 1.5 Nm)
40/5	eShop	40	16	68.8	77.3	3.4	1.8	219799 10 (8IP; 1.5 Nm)
40/6	eShop	40	16	68.8	77.3	3.4	1.8	219799 10 (8IP; 1.5 Nm)
42/5	eShop	40	16	72.2	81.3	3	1.2	219799 10 (8IP; 1.5 Nm)
50/6	eShop	40	22	88.8	97.3	3	1.2	219799 10 (8IP; 1.5 Nm)
50/7	eShop	40	22	88.8	97.3	2.8	0.8	219799 10 (8IP; 1.5 Nm)
52/6	eShop	40	22	92.8	101.3	2.8	0.8	219799 10 (8IP; 1.5 Nm)
63/8	eShop	50	27	114.7	123.3	2.8	0.8	219799 10 (8IP; 1.5 Nm)
63/9	eShop	50	27	114.7	123.3	2.8	0.8	219799 10 (8IP; 1.5 Nm)
80/10	eShop	50	27	—	—	—	—	219799 10 (8IP; 1.5 Nm)



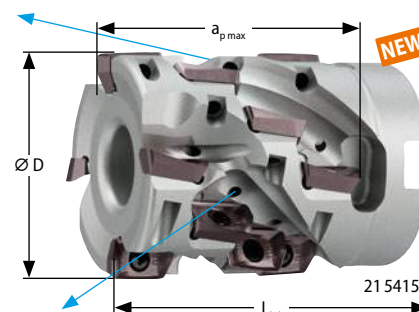
Multi-row

Note: Not for ramping or circular plunging!



$\varnothing D / Z_{eff}$	210 21 5413 GARANT Softcut indexable shoulder mill 90° MTC Weldon shank	Number of effective inserts Z_{eff}	Number of indexable inserts	maximum cutting depth $a_{p max}$	L_1	L_{tot}	$\varnothing D_s$ h6	Set of insert screws
mm				mm	mm	mm	mm	
20/2	eShop	2	6	30	45	95	20	219799 10 (8IP; 1.5 Nm)
25/2	eShop	2	6	30	45	101	25	219799 10 (8IP; 1.5 Nm)
25/3	eShop	3	9	30	45	101	25	219799 10 (8IP; 1.5 Nm)
32/3	eShop	3	12	40	52	112	32	219799 10 (8IP; 1.5 Nm)

$\varnothing D / Z_{eff}$	210 21 5415 GARANT Softcut indexable shoulder mill 90° MTC with bore	Number of effective inserts Z_{eff}	Number of indexable inserts	maximum cutting depth $a_{p max}$	L_{tot}	Mounting bore $\varnothing$	Set of insert screws
mm				mm	mm	mm	
40/4	eShop	4	16	39.5	55	16	219799 10 (8IP; 1.5 Nm)
40/5	eShop	5	10	20	50	16	219799 10 (8IP; 1.5 Nm)
50/4	eShop	4	16	39.5	55	22	219799 10 (8IP; 1.5 Nm)

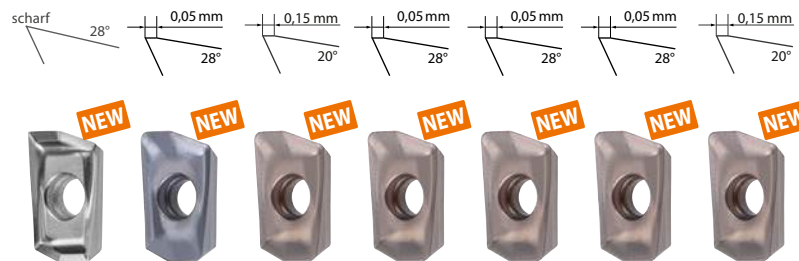


Garant Milling inserts AO.T1104.. for GARANT Softcut® 90° No. 215403 – 215415

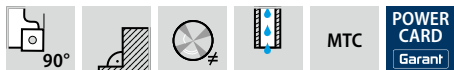
21 5428 – PCD milling insert with one cutting edge.

Note: Standard application values for $a_e = 0.5 \times D / a_p = 3 \text{ mm}$,
 $a_{p \max} = 5.5 \text{ mm}$.
 21 5428 – $a_{p \max} = 3 \text{ mm}$.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	H	H	H	H	H	H	M	M	S	K						
HU7810-1	850	750	600																				
HB7810-1	850	850	750																				
PKD	1500	1500	1000																				
HB7510-1				340	300	260																	
HB7520-1						220	200																
HB8630														170	150								
HB7930-1																40							
HB7730-1																	250						
HB7830-1				330	290	250	200							150	120			●					



Type			ALU	ST900	ST1400	INOX	TI	GG	UNI	
2A1 21 5422	AOET110402 FR	HU7810-1	eShop	–	–	–	–	–	–	10
2A1 21 5423	AOET110404 FR	HU7810-1	eShop	–	–	–	–	–	–	10
2A1 21 5424	AOET110408 FR	HU7810-1	eShop	–	–	–	–	–	–	10
21B 21 5427	AOET110404 FR DLC coated	HB7810-1	eShop	–	–	–	–	–	–	10
21L 21 5428	AOET110404 FR	PCD	eShop	–	–	–	–	–	–	1
2A1 21 5431	AOMT110404 ER	HB7510-1	–	eShop	–	–	–	–	–	10
2A1 21 5432	AOMT110408 ER	HB7510-1	–	eShop	–	–	–	–	–	10
2A1 21 5433	AOMT110412 ER	HB7510-1	–	eShop	–	–	–	–	–	10
2A1 21 5437	AOMT110404 ER	HB7520-1	–	eShop	–	–	–	–	–	10
2A1 21 5438	AOMT110408 ER	HB7520-1	–	eShop	–	–	–	–	–	10
2A1 21 5439	AOMT110412 ER	HB7520-1	–	eShop	–	–	–	–	–	10
2A1 21 5444	AOMT110404 SR	HB7510-1	–	–	eShop	–	–	–	–	10
2A1 21 5445	AOMT110408 SR	HB7510-1	–	–	eShop	–	–	–	–	10
2A1 21 5446	AOMT110412 SR	HB7510-1	–	–	eShop	–	–	–	–	10
2A1 21 5451	AOMT110404 SR	HB7520-1	–	–	eShop	–	–	–	–	10
2A1 21 5452	AOMT110408 SR	HB7520-1	–	–	eShop	–	–	–	–	10
2A1 21 5453	AOMT110412 SR	HB7520-1	–	–	eShop	–	–	–	–	10
2A1 21 5461	AOMT110404 ER	HB8630	–	–	–	eShop	–	–	–	10
2A1 21 5462	AOMT110408 ER	HB8630	–	–	–	eShop	–	–	–	10
2A1 21 5463	AOMT110412 ER	HB8630	–	–	–	eShop	–	–	–	10
2A1 21 5471	AOMT110404 ER	HB7930-1	–	–	–	–	eShop	–	–	10
2A1 21 5472	AOMT110408 ER	HB7930-1	–	–	–	–	eShop	–	–	10
2A1 21 5476	AOMT110404 ER	HB7730-1	–	–	–	–	–	eShop	–	10
2A1 21 5477	AOMT110408 ER	HB7730-1	–	–	–	–	–	eShop	–	10
2A1 21 5478	AOMT110412 ER	HB7730-1	–	–	–	–	–	eShop	–	10
2A1 21 5485	AOMT110404 TR	HB7830-1	–	–	–	–	–	–	eShop	10
2A1 21 5486	AOMT110408 TR	HB7830-1	–	–	–	–	–	–	eShop	10
2A1 21 5487	AOMT110412 TR	HB7830-1	–	–	–	–	–	–	eShop	10
f_z		mm	0.1	0.15	0.18	0.13	0.12	0.15	–	



Garant GARANT Softcut® high-performance indexable shoulder mill 90° MTC for indexable inserts APT 0602..

High precision indexable shoulder mill with irregular pitch for very smooth cutting, very high precision and very high metal removal rate.

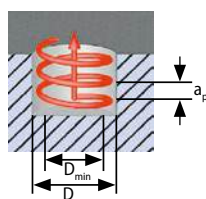
New generation of high performance indexable shoulder mills **with special geometry for reduced cutting forces for MTC applications** under **unstable conditions** or for **spindles with low drive power. Suitable inserts APMT 0602..**

Application: For shoulder milling to large depths, also slotting.
General use in all steels including stainless and acid-resistant steels.

Spare part: Pack of insert screws No. 219827 (6IP; 0.45 Nm).

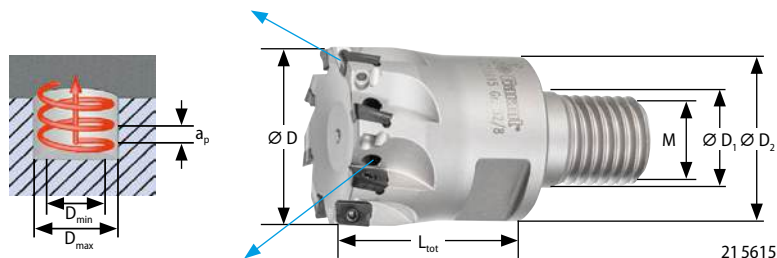
Note: GARANT torque screwdriver TQ No. **211750 size 0.45**, use bit No. **674252 size 6IP**.
The insert pocket must be modified when using indexable inserts with a radius of 2 mm.

Single-row



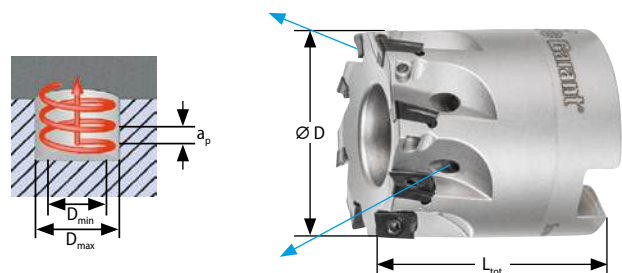
215605

Ø D / number of teeth Z	210	215605	210	215609	L ₁		L _{tot}		Ø D _s h6		Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
	GARANT Softcut 90° shoulder mill														
	MTC short		MTC long		215605	215609	215605	215609	215605	215609					
	Weldon shank		Plain shank		mm	mm	mm	mm	mm	mm					
mm					mm	mm	mm	mm	mm	mm	mm	mm	Degrees	mm	
10/2L	—	eShop	—	17	—	17	—	100	—	8	18	18	0.7	1.67	6.85
10/2	—	eShop	—	17	—	17	—	57	—	10	18	18	0.7	1.67	6.85
12/2L	—	eShop	—	20	—	20	—	120	—	10	22	22	0.8	1.29	8.85
12/2	—	eShop	—	20	—	20	—	80	—	12	22	22	0.8	1.29	8.85
12/3	—	eShop	—	17	—	17	—	62	—	12	22	22	0.8	1.29	8.85
14/3L	—	eShop	—	20	—	20	—	145	—	12	26	26	0.9	1.06	10.85
16/3L	—	eShop	—	20	—	20	—	160	—	14	30	30	0.9	0.89	12.85
16/3	eShop	eShop	20	20	75	90	16	16	30	30	30	30	0.9	0.89	12.85
16/4	eShop	eShop	20	20	75	90	16	16	30	30	30	30	0.9	0.89	12.85
18/4L	—	eShop	—	20	—	20	—	180	—	16	34	34	0.9	0.77	14.85
20/4S	—	eShop	—	20	—	20	—	90	—	16	38	38	0.9	0.68	16.85
20/4L	—	eShop	—	25	—	25	—	200	—	18	38	38	0.9	0.68	16.85
20/4	eShop	eShop	25	22	85	105	20	20	38	38	38	38	0.9	0.68	16.85
20/5	—	eShop	—	22	—	22	—	105	—	20	38	38	0.9	0.68	16.85
25/7S	—	eShop	—	30	—	30	—	180	—	16	48	48	0.9	0.52	21.85
25/7	eShop	eShop	30	25	90	115	25	20	48	48	48	48	0.9	0.52	21.85
32/8	—	eShop	—	30	—	30	—	130	—	25	62	62	1.5	0.4	28.85
40/10	—	eShop	—	30	—	30	—	140	—	32	78	78	0.8	0.31	36.85



21 5615

Ø D / number of teeth Z	210 21 5615 GARANT Softcut 90° shoulder mill MTC with threaded shank	L _{tot}	Ø D ₁ h6	Ø D ₂	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
mm		mm	mm	mm		mm	mm	mm	degrees	mm
10/2	eShop	20	6.5	9.4	M6	18	18	0.7	1.67	6.85
12/3	eShop	20	6.5	10.7	M6	22	22	0.8	1.29	8.85
16/4	eShop	23	8.5	12.7	M8	30	30	0.9	0.89	12.85
20/5	eShop	30	10.5	17.7	M10	38	38	0.9	0.68	16.85
25/7	eShop	35	12.5	20.7	M12	48	48	0.9	0.52	21.85
32/8	eShop	35	17	28.7	M16	62	62	0.9	0.4	28.85
40/10	eShop	35	17	28.7	M16	78	78	0.8	0.31	36.85

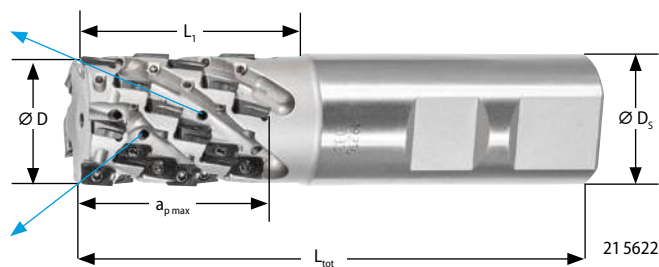


21 5620

Ø D / number of teeth Z	210 21 5620 GARANT Softcut 90° shoulder mill MTC with bore	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
mm		mm	mm	mm	mm	mm	degrees	mm
32/8	eShop	35	16	62	62	0.9	0.4	28.85
40/10	eShop	35	16	78	78	0.8	0.31	36.85
50/11	eShop	40	22	98	98	0.8	0.24	46.85
63/12	eShop	40	22	124	124	0.8	0.19	59.85

Multi-row

Note: Not for ramping or circular plunging!



21 5622

Ø D / Z _{eff}	210 21 5622 GARANT Softcut 90° shoulder mill Weldon shank	Number of effective inserts Z _{eff}	Number of indexable inserts	maximum cutting depth a _{p max}	L ₁	L _{tot}	Ø D _s h6	Set of insert screws
mm				mm	mm	mm	mm	
16/2	eShop	2	8	22.5	32	80	16	219827 (6IP; 0.45 Nm)
20/3	eShop	3	15	28	40	90	20	219827 (6IP; 0.45 Nm)
25/5	eShop	5	30	33.5	44	100	25	219827 (6IP; 0.45 Nm)

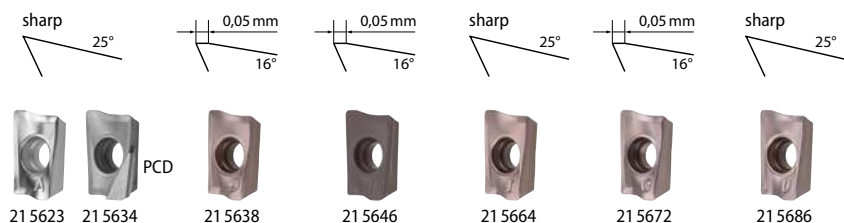
Garant

MTC milling inserts APT 0602.. for GARANT Softcut® indexable milling cutters No. 215605 – 215622

21 5634 – PCD milling insert with one cutting edge.

Note: Standard application values for $a_e = 0.25 \times D$, $a_p = 3$ mm, $a_p \text{ max} = 4$ mm.21 5634 – $a_{p \text{ max}} = 2.5$ mm.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	K	N	N						
21 5621–21 5626	600	500	400																				
21 5630	600	600	550																				
21 5634	1500	1500	1000																				
21 5638/5641				340	300	260										800							
21 5643–21 5652								220	200														
21 5654–21 5659								170	150														
21 5663–21 5671													170	130									
21 5672/5674															250								
21 5680–21 5692				330	290	250							150	120									

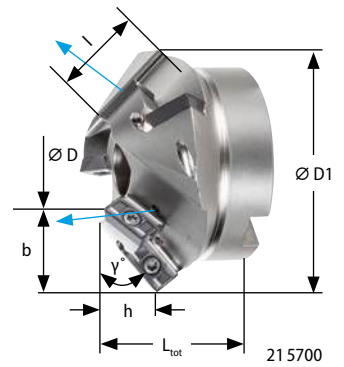


Type			ALU	ST900	ST1400	INOX	GG	UNI	
21A 21 5621	APMT 060202 FR	HU7810	eShop	–	–	–	–	–	10
21A 21 5623	APMT 060204 FR	HU7810	eShop	–	–	–	–	–	10
21A 21 5626	APMT 060220 FR	HU7810	eShop	–	–	–	–	–	10
21B 21 5630	APMT 060204 FR diamond-coated	HB7810	eShop	–	–	–	–	–	1
21L 21 5634	APMT 060204 FR	PCD	eShop	–	–	–	–	–	1
21A 21 5638	APMT 060204 ER	HB7520	–	eShop	–	–	–	–	10
21A 21 5641	APMT 060220 ER	HB7520	–	eShop	–	–	–	–	10
21A 21 5643	APMT 060202 ER	HB7510	–	–	eShop	–	–	–	10
21A 21 5646	APMT 060204 ER	HB7510	–	–	eShop	–	–	–	10
21A 21 5650	APMT 060208 ER	HB7510	–	–	eShop	–	–	–	10
21A 21 5652	APMT 060220 ER	HB7510	–	–	eShop	–	–	–	10
21A 21 5654	APMT 060202 ER	HB7520	–	–	eShop	–	–	–	10
21A 21 5656	APMT 060204 ER	HB7520	–	–	eShop	–	–	–	10
21A 21 5657	APMT 060208 ER	HB7520	–	–	eShop	–	–	–	10
21A 21 5659	APMT 060220 ER	HB7520	–	–	eShop	–	–	–	10
21A 21 5663	APMT 060202 ER	HB7630	–	–	–	eShop	–	–	10
21A 21 5664	APMT 060204 ER	HB7630	–	–	–	eShop	–	–	10
21A 21 5665	APMT 060208 ER	HB7630	–	–	–	eShop	–	–	10
21A 21 5667	APMT 060220 ER	HB7630	–	–	–	eShop	–	–	10
21A 21 5668	APMT 060202 ER	HB8630	–	–	–	eShop	–	–	10
21A 21 5669	APMT 060204 ER	HB8630	–	–	–	eShop	–	–	10
21A 21 5670	APMT 060208 ER	HB8630	–	–	–	eShop	–	–	10
21A 21 5671	APMT 060220 ER	HB8630	–	–	–	eShop	–	–	10
21A 21 5672	APMT 060204 ER	HB7730	–	–	–	–	eShop	–	10
21A 21 5674	APMT 060220 ER	HB7730	–	–	–	–	eShop	–	10
21A 21 5680	APMT 060202 ER	HB7520	–	–	–	–	–	eShop	10
21A 21 5686	APMT 060204 ER	HB7520	–	–	–	–	–	eShop	10
21A 21 5690	APMT 060208 ER	HB7520	–	–	–	–	–	eShop	10
21A 21 5692	APMT 060220 ER	HB7520	–	–	–	–	–	eShop	10
f_z		mm	0.1	0.1	0.1	0.08	0.08	–	



Garant Indexable chamfer mill for AP.. 1604..

- Note:**
- Recommended milling inserts for chamfering: No. 215720; 215724; 215728; 215744; 215758.
 - If other milling inserts are used, the tool life may be less and surface quality may suffer.
 - Use GARANT torque screwdriver TQ No. 211750 size 5.0 with bit No. 674252 size 15IP.



γ°	75	60	50	45	40	30	20	15
Correction factor f _z	1.0	1.2	1.3	1.4	1.6	2	3	3.5

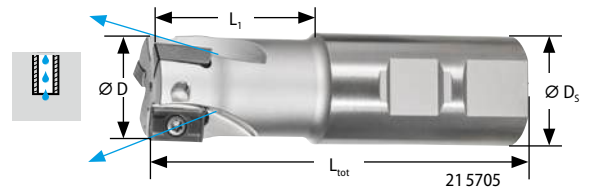
Angle γ	210	21 5700	Number of effective inserts Z _{eff}	Number of indexable inserts	L _{tot}	smallest Ø D	largest Ø D ₁	achievable chamfer width b	achievable chamfer length l	achievable chamfer height h	Mounting bore Ø	Feed rate per tooth at h _{max}	Set of insert screws
		Chamfer mill											
degrees		with bore			mm	mm	mm	mm	mm	mm	mm	mm	
15		eShop	3	6	50	35.4	94	29.5	30	8	27	0.4	219811 (15IP; 5.0 Nm)
20		eShop	3	6	50	35	91	28.5	30	10	27	0.3	219811 (15IP; 5.0 Nm)
30		eShop	3	6	50	35	84.6	26.5	30	15.1	27	0.2	219811 (15IP; 5.0 Nm)
40		eShop	3	6	50	35	84	24.5	30	19	27	0.16	219811 (15IP; 5.0 Nm)
45		eShop	3	6	50	35	77.8	21.4	30	21.4	27	0.14	219811 (15IP; 5.0 Nm)
50		eShop	3	6	50	35	73	18	30	23	27	0.13	219811 (15IP; 5.0 Nm)
60		eShop	3	6	50	34.8	65	15.1	30	26.5	27	0.12	219811 (15IP; 5.0 Nm)
75		eShop	3	6	60	35	50.7	8	30	29.5	22	0.11	219811 (15IP; 5.0 Nm)



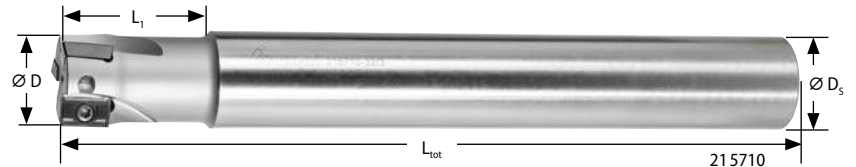
Shoulder mill 90° for AP.. 16..

Indexable shoulder mill with irregular pitch for very smooth cutting.

- Note:** Use GARANT torque screwdriver TQ No. 211750 size 5.0 with bit No. 674252 size 15IP.



21 5710 – Without through-coolant feed.

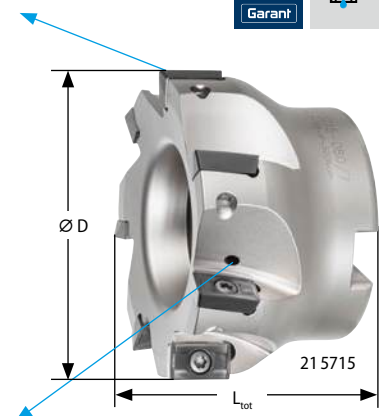


Ø D / number of teeth Z	210	21 5705	210	21 5710	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Set of insert screws
		Garant		Garant					
		Shoulder mill 90°							
		short	long						
		Weldon shank	Plain shank						
mm					mm	21 5705	21 5710		
25/2		eShop	eShop		44	100	200	AP.. 16..	219811 (15IP; 5.0 Nm)
32/3		eShop	eShop		50	110	250	AP.. 16..	219812 (15IP; 5.0 Nm)
40/4		eShop	—		55	115	—	AP.. 16..	219812 (15IP; 5.0 Nm)

Size 160/10 – For arbors to DIN 2079, with 4 additional attachment holes.
For technical reasons without internal coolant supply.

21 5717 – Without through-coolant feed.

Ø D / number of teeth Z	210	21 5715	220	21 5717	L _{tot}	Mounting bore Ø	suitable indexable insert	Set of insert screws
		Garant		HOLEX				
		Shoulder mill 90°						
		with bore	with bore					
mm					mm	mm		
40/4		eShop	eShop		40	16	AP.. 16..	219812 (15IP; 5.0 Nm)
50/5		eShop	eShop		40	22	AP.. 16..	219812 (15IP; 5.0 Nm)
52/5		eShop	—		40	22	AP.. 16..	219812 (15IP; 5.0 Nm)
63/5		eShop	—		40	22	AP.. 16..	219812 (15IP; 5.0 Nm)
63/6		eShop	eShop		40	22	AP.. 16..	219812 (15IP; 5.0 Nm)
66/6		eShop	—		40	22	AP.. 16..	219812 (15IP; 5.0 Nm)
80/7		eShop	—		50	27	AP.. 16..	219812 (15IP; 5.0 Nm)
100/8		eShop	—		50	32	AP.. 16..	219812 (15IP; 5.0 Nm)
125/9		eShop	—		63	40	AP.. 16..	219812 (15IP; 5.0 Nm)
160/10		eShop	—		63	40	AP.. 16..	219812 (15IP; 5.0 Nm)



Milling inserts AP.. 16.. for milling cutters No. 215700, 215705, 215710, 215715 and 215717

Note: Standard application values apply for milling cutters No. 215705 to 215717: $a_e = 0.3 \times D / a_{p\max} = 7 \text{ mm}$.

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si												INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K						
215720–215728	700	500	350																					
215731/5733				340	235	195	190	175							220	140		150		●	●	●	●	●
215732				250	250	185	140								140	140				●	●	●	●	●
215743/5745/5746				380	265	220	210	195							270	170		170		●	●	●	●	●
215744						170	120	90										140		●	●	●	●	●
215747–215756	700	500	350	230	230	170	120	90							160	150	35			●	●	●	●	●
215758				295	190	170	125	80	55	40					170	140		140		●	●	●	●	●
215759/5762				270	205	170	150	125							175	150	50	140		●	●	●	●	●
215760				250	250	185	140	110							140	140		140		●	●	●	●	●
215764			220	290	160	140	110	70							160	150		150	●			●		



215724



215732



215744



215747



215764

Type			ALU	ST900	ST1400	INOX	UNI		Insert thickness mm
21A 215720		APEX 160404 PDFR	HB7510	eShop	—	—	—	10	4.76
21A 215724		APKT 16..04 PDFR	HU7710	eShop	—	—	—	10	5.05
21A 215728		APKT 16..08 PDFR	HU7710	eShop	—	—	—	10	5.05
21A 215732		APXT 16..08 PDSR	HB7525	—	eShop	—	—	10	5.76
21A 215731		APMX 16..04 TR	HB7525	—	eShop	—	—	10	5.76
21A 215733		APMX 16..08 TR	HB7525	—	eShop	—	—	10	5.76
21A 215744		APFT 160408 PDTR	HB7720	—	—	eShop	—	10	4.76
21A 215743		APMX 16..04 TR	HB7515	—	—	eShop	—	10	5.76
21A 215745		APMX 16..08 TR	HB7515	—	—	eShop	—	10	5.76
21A 215746	Garant	APMX 16..12 TR	HB7515	—	—	eShop	—	10	5.76
21A 215747		APMX 16..04 PDER	HB7635	—	—	eShop	—	10	5.76
21A 215748		APMX 16..08 PDER	HB7635	—	—	eShop	—	10	5.76
21A 215749		APMX 16..12 PDER	HB7635	—	—	eShop	—	10	5.76
21A 215752		APKX 16..16 PDER	HB7635	—	—	eShop	—	10	5.76
21A 215756		APKX 16..24 PDER	HB7635	—	—	eShop	—	10	5.76
21A 215758		APKT 1604 PDTR	HB7525	—	—	—	eShop	10	4.76
21A 215759		APMX 16..08 TR	HB735	—	—	—	eShop	10	5.76
21A 215760		APMX 16..08 PDTR	HB7520	—	—	—	eShop	10	5.76
21A 215762		APMX 16..12 TR	HB735	—	—	—	eShop	10	5.76
22A 215764	HOLEX	APKT 1604 PDER	HBM025	—	—	—	eShop	10	5.76
f_z			mm	0.18	0.18	0.14	0.15	—	

KENNAMETAL Milling inserts APT 1604.. for milling cutters No. 215705, 215710, 215715 and 215717

Note: Please use these indexable inserts **only with screw No. 229908 (15 IP; 5.0 Nm)**. The insert seating must be modified when indexable inserts with $r \geq 3.2 \text{ mm}$ are used on milling cutters No. 215705, 215710, 215715 and 215717.

Suitable for/ v_c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si												INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K						
215768																		280					●	
215771–215778				250	200	170	130	110							180	155	45	200	●	○	●	●	●	●
215780/5781						150	110								170	150	55	180	●	●	○	●	●	●



Type			GG	UNI	
28E 215768	APKT 1604PDER-43	SC3025	eShop	—	10
28E 215771	APHT 160408ER-46	SP6519	—	eShop	10
28E 215773	APHT 160416ER-46	SP6519	—	eShop	10
28E 215775	APHT 160424ER-46	SP6519	—	eShop	10
28E 215776	APHT 160432ER-46	SP6519	—	eShop	10

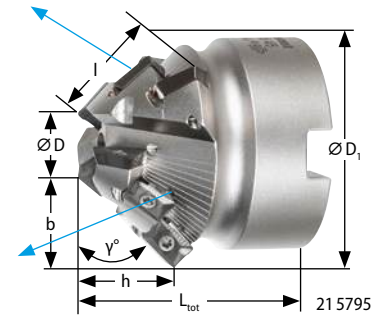
Type			UNI	
28E 215777	APHT 160440ER-46	SP6519	eShop	10
28E 215778	APHT 160450ER-46	SP6519	eShop	10
28F 215780	APKT 1604PDER-45	X500	eShop	10
28F 215781	APHT 160408ER-46	X500	eShop	10



Garant Indexable chamfer mill for AP.. 1003..

Note: Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

γ°	75	60	45	40	30	20	15
Correction factor fz	1	1.2	1.4	1.6	2	3	3.5



Angle γ	210	21 5795	Number of effective inserts Z_{eff}	Number of indexable inserts	L_{tot}	smallest $\varnothing D$	largest $\varnothing D_1$	achievable chamfer width b	achievable chamfer length l	achievable chamfer height h	Mounting bore $\varnothing$	Feed rate per tooth at h_{max}	Set of insert screws
degrees		Chamfer mill with bore			mm	mm	mm	mm	mm	mm	mm	mm	
15		eShop	3	9	52	17	70	27	27.5	7	22	0.4	219814 (8IP; 1.2 Nm)
20		eShop	3	9	52	17	69	26	27.5	9	22	0.3	219814 (8IP; 1.2 Nm)
30		eShop	3	9	52	17	65	24	27.5	13	22	0.2	219814 (8IP; 1.2 Nm)
40		eShop	3	9	52	17	59	19	27.5	17.8	22	0.16	219814 (8IP; 1.2 Nm)
45		eShop	3	9	52	17	56	17.8	27.5	19	22	0.14	219814 (8IP; 1.2 Nm)
60		eShop	3	9	52	17	45	13	27.5	24	16	0.12	219814 (8IP; 1.2 Nm)
75		eShop	3	9	60	19	33	7	27.5	27	16	0.11	219814 (8IP; 1.2 Nm)



Shoulder mill 90° for AP.. 1003..

Note: Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

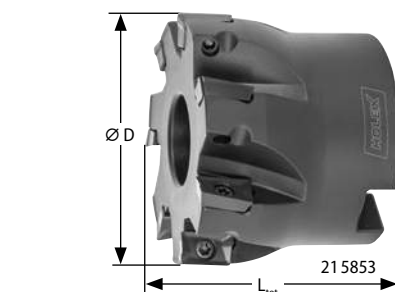
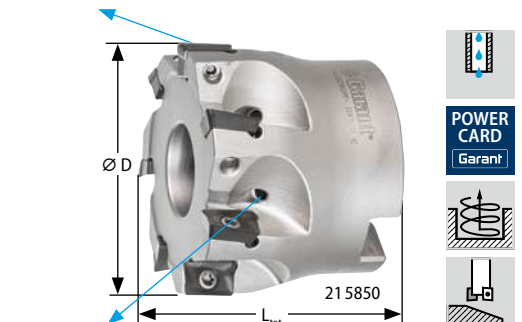
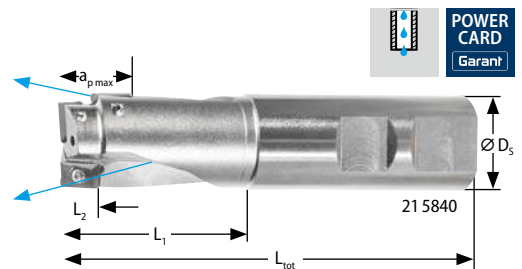
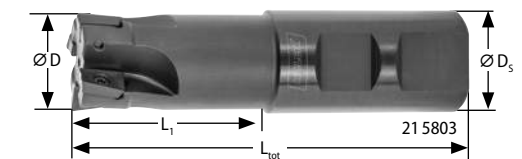
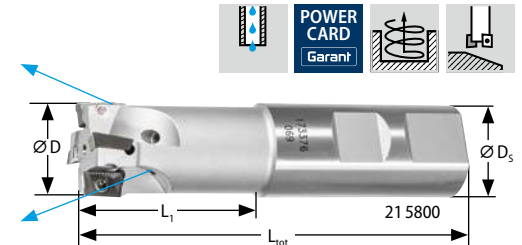
$\varnothing D$ / number of teeth Z	210	21 5800	220	21 5803	L_1	L_{tot}	$\varnothing D_s$ h6	suitable indexable insert	Set of insert screws
		Garant		HOLEX					
		Shoulder mill 90°							
mm		Weldon shank		Weldon shank	mm	mm	mm		
10/1		eShop		—	28	80	16	AP.. 1003..	219814 (8IP; 1.2 Nm)
12/1		eShop		—	28	80	16	AP.. 1003..	219814 (8IP; 1.2 Nm)
14/1		eShop		—	37	85	16	AP.. 1003..	219814 (8IP; 1.2 Nm)
16/2		eShop		eShop	37	85	16	AP.. 1003..	219814 (8IP; 1.2 Nm)
18/2		eShop		—	40	90	20	AP.. 1003..	219814 (8IP; 1.2 Nm)
20/2L		eShop		—	50	150	20	AP.. 1003..	219814 (8IP; 1.2 Nm)
20/2		eShop		—	40	90	20	AP.. 1003..	219814 (8IP; 1.2 Nm)
20/3		eShop		eShop	40	90	20	AP.. 1003..	219814 (8IP; 1.2 Nm)
25/2L		eShop		—	55	170	25	AP.. 1003..	219814 (8IP; 1.2 Nm)
25/3		eShop		—	49	105	25	AP.. 1003..	219814 (8IP; 1.2 Nm)
25/4		eShop		eShop	49	105	25	AP.. 1003..	219814 (8IP; 1.2 Nm)
32/3L		eShop		—	55	195	25	AP.. 1003..	219814 (8IP; 1.2 Nm)
32/5		eShop		—	54	110	25	AP.. 1003..	219814 (8IP; 1.2 Nm)

Application:

21 5840 – For drilling and for machining of slots.

$\varnothing D$ / number of effective cutting edges Z	210	21 5840	Number of indexable inserts	maximum cutting depth a_{pmax}	L_1	L_2	L_{tot}	$\varnothing D_s$ h6	Set of insert screws
		Garant							
		Shoulder mill 90°							
mm		Weldon shank		mm	mm	mm	mm	mm	
20/2		eShop	3	17	35	9	90	20	219814 (8IP; 1.2 Nm)
25/2		eShop	3	19	50	9	110	25	219814 (8IP; 1.2 Nm)

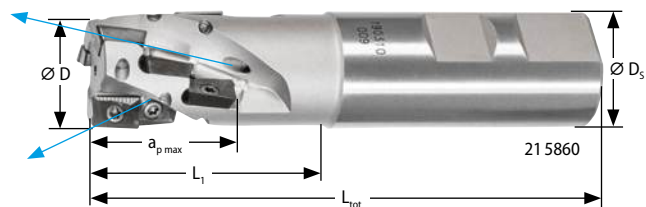
$\varnothing D$ / number of teeth Z	210	21 5850	220	21 5853	L_{tot}	Mounting bore $\varnothing$	suitable indexable insert	Set of insert screws
		Garant		HOLEX				
		Shoulder mill 90°						
mm		with bore		with bore	mm	mm		
40/4		eShop		—	40	16	AP.. 1003..	219814 (8IP; 1.2 Nm)
40/6		eShop		eShop	40	16	AP.. 1003..	219814 (8IP; 1.2 Nm)
50/6		eShop		—	40	22	AP.. 1003..	219814 (8IP; 1.2 Nm)
50/7		eShop		eShop	40	22	AP.. 1003..	219814 (8IP; 1.2 Nm)
63/8		eShop		—	40	22	AP.. 1003..	219814 (8IP; 1.2 Nm)
63/9		eShop		—	40	22	AP.. 1003..	219814 (8IP; 1.2 Nm)
80/10		eShop		—	50	27	AP.. 1003..	219814 (8IP; 1.2 Nm)
100/12		eShop		—	50	32	AP.. 1003..	219814 (8IP; 1.2 Nm)



**Application:**

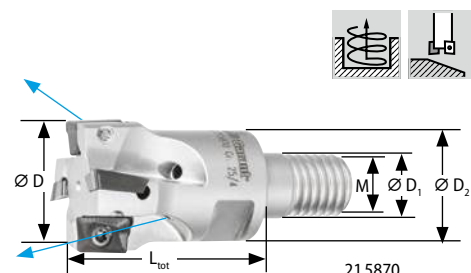
21 5860 – For peripheral milling and side milling.

21 5870 – General application in all materials and for slot milling.



Ø D / Z _{eff}	210	21 5860 Garant	Number of effective inserts Z _{eff}	Number of indexable inserts	maximum cutting depth a _{p max}	L ₁	L _{tot}	Ø D _s h6	Set of insert screws
		Shoulder mill 90°							
mm		Weldon shank			mm	mm	mm	mm	
25/2		eShop	2	6	28	52	110	25	219814 (8IP; 1.2 Nm)
25/3		eShop	3	9	28	52	110	25	219814 (8IP; 1.2 Nm)
32/2		eShop	2	8	38	54	114	32	219814 (8IP; 1.2 Nm)
32/3		eShop	3	12	38	54	114	32	219814 (8IP; 1.2 Nm)

Ø D / number of teeth Z	210	21 5870 Garant	L _{tot}	Ø D ₁ h6	Ø D ₂	Mounting thread M	Set of insert screws
		Shoulder mill 90°					
mm		with threaded shank	mm	mm	mm		
15,7/2		eShop	23	8.5	12.7	M8	219814 (8IP; 1.2 Nm)
16/2		eShop	23	8.5	12.7	M8	219814 (8IP; 1.2 Nm)
19,7/3		eShop	30	10.5	17.7	M10	219814 (8IP; 1.2 Nm)
20/3		eShop	30	10.5	17.7	M10	219814 (8IP; 1.2 Nm)
24,7/4		eShop	35	12.5	20.7	M12	219814 (8IP; 1.2 Nm)
25/3		eShop	35	12.5	20.7	M12	219814 (8IP; 1.2 Nm)
25/4		eShop	35	12.5	20.7	M12	219814 (8IP; 1.2 Nm)
32/5		eShop	43	17	28.7	M16	219814 (8IP; 1.2 Nm)

**MTC milling inserts AP.. 1003.. for milling cutters No. 215795 – 215870**

Inserts with highly positive geometry and helical cutting edges.

Note: Standard application values apply for indexable milling cutters No. 215800, 215803, 215850, 215853 and 215870.
For a_e = 0.3×D / a_{p max} = 4.8 mm.

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
21 5879/5885				440	310	260	250	230				320	210		210				●	○	○	●	●
21 5880				300	250	240	160	125				180	160		220			●	○	○	●	●	
21 5882				330	255	205	175	150				220	155	50				●	○	○	●	●	
21 5886			220	290	160	140	110	70				160	150		150			●	○	○	●	●	
21 5918–21 5928	700	600		180	160	150	130	110				90	80	50				●	○	○	●	●	
21 5935/5939	700	600	400													500	400	●	○	○	●	●	
21 5946/5947				390	270	230	220	200				250	160		180			●	○	○	●	●	



Type			ALU	ST900	ST1400	INOX	UNI		Insert thickness mm		
21A	21 5935	Garant	APHT 100302 FR	HU7815	eShop	—	—	—	10	3.5	
21A	21 5939		APHT 100305 FR	HU7815	eShop	—	—	—	10	3.5	
21A	21 5946		APMT 100305 TR	HB7525	—	eShop	—	—	10	3.5	
21A	21 5947		APMT 100308 TR	HB7525	—	eShop	—	—	10	3.5	
21A	21 5879		APMT 100305 TR	HB7515	—	—	eShop	—	10	3.5	
21A	21 5885		APMT 100308 TR	HB7515	—	—	eShop	—	10	3.5	
21A	21 5918		APMT 100302 TR	HB7635	—	—	—	eShop	—	10	3.5
21A	21 5920		APMT 100305 TR	HB7635	—	—	—	eShop	—	10	3.5
21A	21 5922		APMT 100308 TR	HB7635	—	—	—	eShop	—	10	3.5
21A	21 5924		APMT 100312 TR	HB7635	—	—	—	eShop	—	10	3.5
21A	21 5928		APMT 100320 TR	HB7635	—	—	—	eShop	—	10	3.5
21A	21 5880		APMT 100305 TR	HB7520	—	—	—	—	eShop	10	3.55
21A	21 5882			HB735	—	—	—	—	eShop	10	3.5
22A	21 5886		HOLEX	APKT 1003 PDER	HBM025	—	—	—	—	eShop	10
f _z			mm	0.12	0.12	0.1	0.12	—			

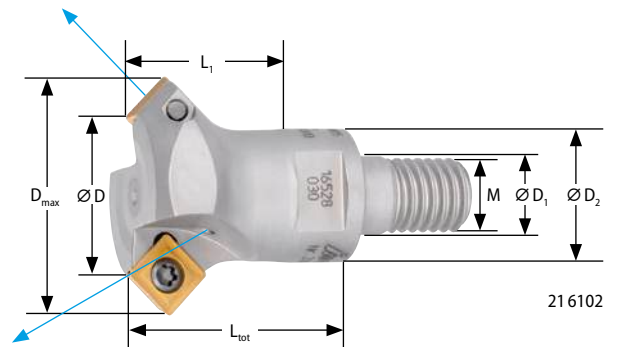


Garant Indexable chamfer mill 45° positive for SD.T 090308

Note: Use GARANT torque screwdriver TQ No. 211750 size 3.8 with bit No. 674252 size 15IP.



Ø D	210	21 6100	Number of cutting edges Z	Ø D _{max}	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Set of insert screws
		Chamfer mill 45°							
mm		Weldon shank		mm	mm	mm	mm		
8		eShop	1	20.2	17	80	16	SD.. 090308	219804 (15IP; 3.8 Nm)
16		eShop	2	28.3	20.5	110	16	SD.. 090308	219805 (15IP; 3.8 Nm)
17,5		eShop	3	29.8	25	110	16	SD.. 090308	219805 (15IP; 3.8 Nm)
23,5		eShop	4	35.8	30	130	20	SD.. 090308	219805 (15IP; 3.8 Nm)
25		eShop	2	37.3	27	130	25	SD.. 090308	219805 (15IP; 3.8 Nm)
33,5		eShop	5	45.8	30	140	25	SD.. 090308	219805 (15IP; 3.8 Nm)

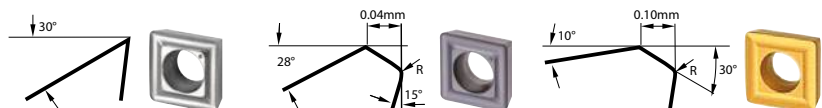


Ø D	210	21 6102	Number of cutting edges Z	Ø D _{max}	L ₁	Ø D ₁ h6	L _{tot}	Ø D ₂	Mounting thread M	suitable indexable insert	Set of insert screws
		Chamfer mill 45°									
mm		with threaded shank		mm	mm	mm	mm	mm			
8		eShop	1	20.2	14	6.5	23	9.75	M6	SD.. 090308	219804 (15IP; 3.8 Nm)
16		eShop	2	28.3	18	10.5	28	17.7	M10	SD.. 090308	219805 (15IP; 3.8 Nm)
17,5		eShop	3	29.8	18	10.5	30	17.7	M10	SD.. 090308	219805 (15IP; 3.8 Nm)
23,5		eShop	4	35.8	23	12.5	35	20.7	M12	SD.. 090308	219805 (15IP; 3.8 Nm)
25		eShop	2	37.3	23	12.5	35	20.7	M12	SD.. 090308	219805 (15IP; 3.8 Nm)
33,5		eShop	5	45.8	24	17	40	28.7	M16	SD.. 090308	219805 (15IP; 3.8 Nm)

Garant Milling inserts SD.T 090308 for 45° chamfer mills No. 216100 / 216102

Strong milling inserts, **precision sintered with positive chip breakers**. Face and seating surfaces precision ground.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	Ti	GG(G)	CuZn	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N				
21 6408	250	250	120										150	120		250		●	○	○	○
21 6409													120	90				○	○	○	○
21 6410	250	250	120	260	220	170	100	80							100	150	●	○	○	○	○



Type			ALU	INOX	UNI	
21A 21 6408	SDGT 090308 FN	HU7815	eShop	—	—	10
21A 21 6409	SDGT 090308	HB7630	—	eShop	—	10
21A 21 6410	SDLT 090308 EN	HB7535	—	—	eShop	10
f _z		mm	0.15	0.11	—	

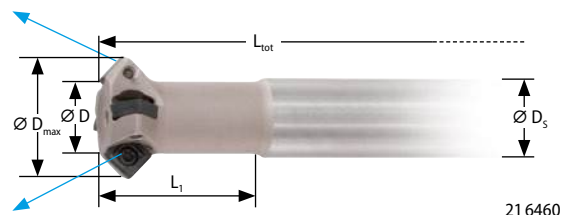


Garant High-performance chamfer mill 45° for SCLT 05T104

Application: For effective machining especially for small chamfering operations. For forwards and reverse chamfering at high speeds.

Reverse chamfering possible from size 6.

Note: Use GARANT torque screwdriver TQ No. **211750 size 0.6** with bit No. **674252 size 6IP**.



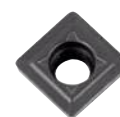
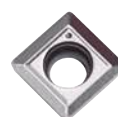
Ø D	210	21 6460	Number of cutting edges Z	Ø D _{max}	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Set of insert screws
		High-performance chamfer mill 45°							
mm		Plain shank		mm	mm	mm	mm		
2		eShop	1	8.5	20	80	10	SC.. 05T104	219828 (6IP; 0.6 Nm)
6		eShop	1	12.5	20	80	10	SC.. 05T104	219828 (6IP; 0.6 Nm)
9		eShop	2	15.7	24	90	10	SC.. 05T104	219828 (6IP; 0.6 Nm)
12		eShop	4	18.5	24	100	12	SC.. 05T104	219828 (6IP; 0.6 Nm)
16		eShop	5	22.7	20	110	12	SC.. 05T104	219828 (6IP; 0.6 Nm)
20		eShop	6	26.7	20	120	16	SC.. 05T104	219828 (6IP; 0.6 Nm)

Garant Milling inserts SCLT 05T104 for high-performance 45° chamfer mill No. 216460

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
21 6465	1000	700	400																	●	●	●	○
21 6463	1000	900	550														●			●	●	○	
21 6470														160	120	60				○	○	●	
21 6475	410	410	280	240	205	200	150	120						110	95	60		●		○	○	●	



21 6463



Type			ALU	INOX	UNI	
21A 21 6465	SCLT 05T104	HU7810	eShop	—	—	10
21B 21 6463	SCLT 05T104 diamond-coated	HB7810	eShop	—	—	1
21A 21 6470	SCLT 05T104	HB7635	—	eShop	—	10
21A 21 6475	SCLT 05T104	HB7735	—	—	eShop	10
f _z	mm		0.08 — 0.18	0.06 — 0.15	—	



Garant Adjustable indexable countersinking mill (10° – 80°) for TOH. 0902.. / 1604..

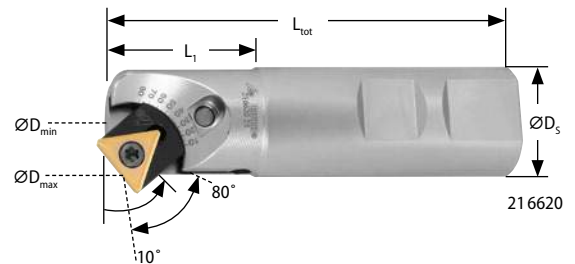
Quiet running due to **sturdy design**.

Application: For deburring edges, round holes, and long holes, and for countersinking. Rigid mounting is required (not suitable for power drills).
Steplessly adjustable for angles of 10° - 80°.

Note: Scale tolerance $\pm 2.5^\circ$. **For setting to an exact angular value please use a pre-setting device.**

Size 20 – Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

Size 25 – Use GARANT torque screwdriver TQ No. **211750 size 3.0** with bit No. **674252 size 15IP**.



Shank Ø D _s h6	210	Number of cutting edges Z	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Indexable insert No. 216700; No. 216740; No. 216770	Insert screw	Case	Clamp screw for cartridge
	Adjustable indexable countersinking mill									
mm	Weldon shank		mm	mm	mm					
20	eShop	1	30	95	20	TO.. 0902	14-660	219843 (8IP; 1.2 Nm)	219957	219945
25	eShop	1	30	95	25	TO.. 1604	32-050	219844 (15IP; 3.0 Nm)	219958	219946

Angle α		10	20	30	40	45	50	60	70	80
20	D _{min} (Ø)	5	8	10	13	14	15	17	19	20
	D _{max} (Ø)	26	27	27	27	27	27	26	25	24
25	D _{min} (Ø)	5	6	7	10	11	13	16	19	23
	D _{max} (Ø)	32	33	34	33	33	32	31	29	27

KOMET Trigon milling inserts TOH. 0902.. / 1403.. / 1604..

With all-round chip breaker groove.

Size 14-6603 – With additional rake for free cutting. Clearance angle 15°.

Suitable for: Countersinking mill No. 216600 and 216620.

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10% Si	Cast < 500 N	Cast < 750 N	Cast < 900 N	Cast < 1100 N	Cast < 1400 N	Cast < 55 HRC	Cast < 60 HRC	Cast < 65 HRC	Cast < 67 HRC	Cast < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP	Oil	Water	Chip breaker	Chip breaker	Chip breaker
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
21 6700	250	250		250	200	200								120						●			
21 6740																	150			●			
21 6770	250	250	120	250	200	200	150	120						120	100	100	150			●	○		



21 6700



21 6770



21 6770



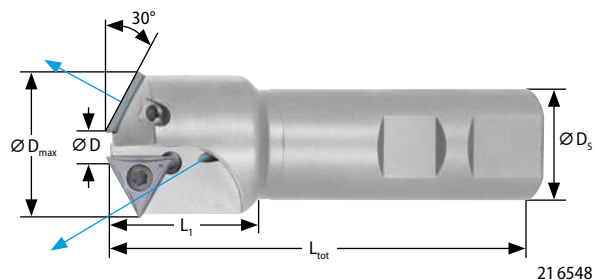
21 6770

Designation			14-6603	14-660	26-660	32-050	
24T	21 6700	KOMET® indexable insert P25M	eShop	eShop	eShop	eShop	10
24T	21 6740		eShop	eShop	eShop	—	10
24T	21 6770		eShop	eShop	eShop	eShop	10
ISO code indexable insert			TOHX 090204 EN	TOHX 090204 EN	TOHX 140305 EN	TOHT 160408 EN	



Garant Indexable chamfer mill 30° for TC.T 16T304

Note: Use GARANT torque screwdriver TQ No. **211750 size 3.0** with bit No. **674252 size 15IP**.

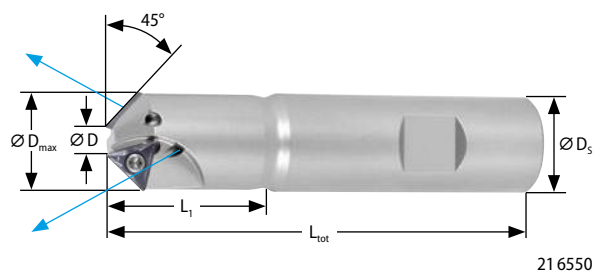


Type	210	21 6548	Number of cutting edges Z	Ø D	Ø D _{max}	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Insert screw
		Chamfer mill 30°								
		Weldon shank		mm	mm	mm	mm	mm		
6		eShop	2	6	32	38	100	25	260986 HB725-1	219844 (15IP; 3.0 Nm)



Garant Indexable chamfer mill 45° for TC.T 110204 / 16T304

Note:
 Size 10 – Use GARANT torque screwdriver TQ No. **211750 size 3.0** with bit No. **674252 size 15IP**.
 Size 1; 6 – Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

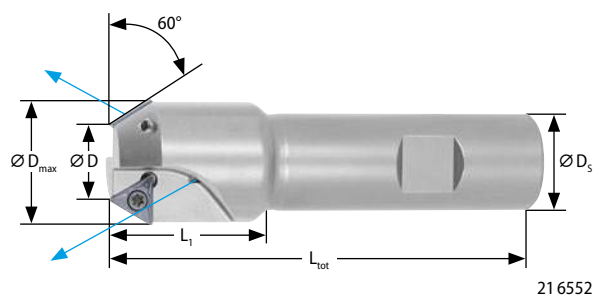


Type	210	21 6550	Number of cutting edges Z	Ø D	Ø D _{max}	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Insert screw
		Chamfer mill 45°								
		Weldon shank		mm	mm	mm	mm	mm		
1		eShop	1	1.2	16	20	70	12	260982 HB725-1	219795 1 (8IP; 1.2 Nm)
6		eShop	2	6.2	21	35	90	20	260982 HB725-1	219795 1 (8IP; 1.2 Nm)
10		eShop	2	10.4	32.5	42	100	25	260986 HB725-1	219844 (15IP; 3.0 Nm)



Garant Indexable chamfer mill 60° for TC.T 110204 / 16T304

Note:
 Size 20 – Use GARANT torque screwdriver TQ No. **211750 size 3.0** with bit No. **674252 size 15IP**.
 Size 5; 16 – Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

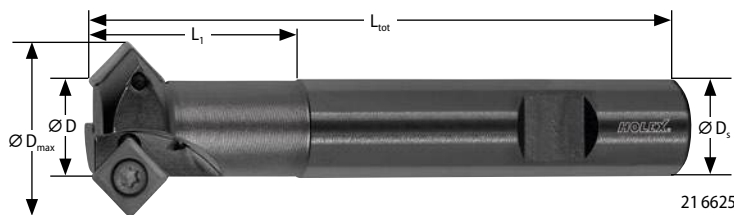


Type	210	21 6552	Number of cutting edges Z	Ø D	Ø D _{max}	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Insert screw
		Chamfer mill 60°								
		Weldon shank		mm	mm	mm	mm	mm		
5		eShop	1	5.4	16	20	70	12	260982 HB725-1	219795 1 (8IP; 1.2 Nm)
16		eShop	2	15.8	26	35	90	20	260982 HB725-1	219795 1 (8IP; 1.2 Nm)
20		eShop	2	20	35	39	100	25	260986 HB725-1	219844 (15IP; 3.0 Nm)



HOLEX

Chamfer mill 45° for SP.T 060304 and SP.T 09T308



21 6625

Type	220	21 6625	Number of cutting edges Z	Ø D	Ø D _{max}	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Set of insert screws
		Chamfer mill 45°								
		Weldon shank		mm	mm	mm	mm	mm		
4		eShop	1	4	10	28	80	12	SP..060304	219840 (8IP; 1.2 Nm)
11		eShop	2	11	20	32	80	12	SP..060304	219840 (8IP; 1.2 Nm)
12		eShop	1	12	23.7	37	100	20	SP..09T308	219841 (15IP; 3.0 Nm)
16		eShop	2	16	28.8	32	100	16	SP..09T308	219841 (15IP; 3.0 Nm)
30		eShop	3	30	42.3	32	100	20	SP..09T308	219841 (15IP; 3.0 Nm)



HOLEX

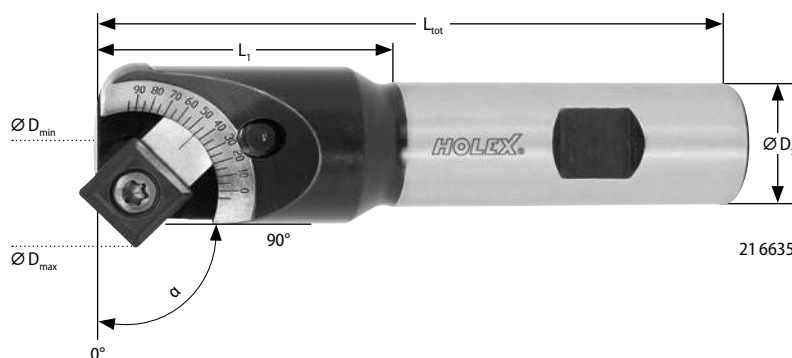
Adjustable indexable countersinking mill (0 – 90°) for SP.T 09T308 / 120408

Made of hardened tool steel. Deeply engraved scale.

Two exposed insert edges

Application: For forwards and reverse deburring, chamfering and countersinking.
Suitable for oblique plunging.
Steplessly adjustable for angles of 0° - 90°.

Note: For setting to an exact angular value, use a pre-setting device.



21 6635

Shank Ø D _s h6	220	21 6635	L ₁	L _{tot}	suitable indexable insert	Set of insert screws	Adjustment element	Clamping screw for adjustment element
		Adjustable indexable countersinking mill						
		Weldon shank	mm	mm				
16		eShop	37	86	SPT09T3..	219841 (15IP; 3.0 Nm)	219885	219887
20		eShop	44	98	SPT1204..	219848 (20IP; 5.5 Nm)	219886	219888
25		eShop	49	105	SPT1204..	219848 (20IP; 5.5 Nm)	219886	219888

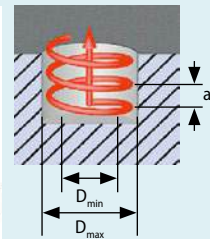
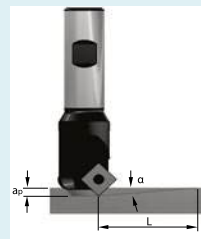
Angle α		0	10	20	30	40	45	50	60	70	80	90
16	D _{min} (Ø)	2.8	4.7	6.8	9.0	11.2	12.3	13.4	15.6	17.7	19.4	3.5
	D _{max} (Ø)	20.4	21.8	22.9	23.7	24.1	24.2	24.1	23.8	23.2	22.6	21.0
20	D _{min} (Ø)	3.1	5.7	8.4	11.6	14.3	16	17.3	20.3	23.1	25.4	3.9
	D _{max} (Ø)	26.9	28.8	30.3	31.4	31.9	32	31.9	31.6	30.7	29.4	27.6
25	D _{min} (Ø)	6.7	9.4	11.8	14.8	17.7	19.4	20.7	23.7	26.4	28.9	7.1
	D _{max} (Ø)	30.4	32.3	33.7	34.8	35.3	35.4	35.3	34.9	34.0	32.7	30.9

HOLEX

Operating instructions circular plunging and oblique plunging for No. 21 6635

i

Mill Ø D	Adjustment angle of the indexable insert	Circular plunging (interpolation)				Oblique plunging (ramping)		
		D _{min}	D _{max}	Plunge angle α	a _{p max}	Plunge angle α	Ramp distance L	a _{p max}
mm	degrees	mm	mm	degrees		degrees	mm	
16	30	31	38.5	4	1.6	3	32.0	1.6
	45	34.5	39	3	1.6	3	36.0	1.6
	60	37	40	2	1.6	2	38.0	1.6
20	30	41.5	52	3	2.0	5	21.0	2.0
	45	46	53	3	2.0	4	26.0	2.0
	60	49.5	54	2	2.0	4	26.0	2.0
25	30	49	56.5	3	2.0	5	25.0	2.0
	45	53.5	58.5	2	2.0	4	27.0	2.0
	60	57	60.5	2	2.0	4	29.0	2.0





Garant Radius cutter for inserts No. 216841

Application: For producing convex radii on components. The slim and compact design permits a wide variety of applications and is particularly suitable for use in deep cavities.



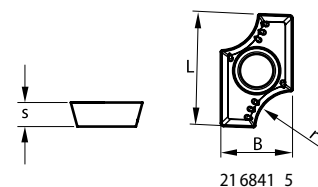
Type	210	21 6825	Number of cutting edges Z	Ø D _s	Ø D _{max}	L ₁	L _{tot}	r _{min}	r _{max}	suitable indexable insert	Insert screw
		Radius cutter									
		Weldon shank		mm	mm	mm	mm	mm	mm		
1		eShop	2	20	22	35	120	1	2.5	216841 1 - 2.5	219879 1 (TX15; 3Nm)
2		eShop	2	20	22	35	120	3	5	216841 3 - 5	219879 1 (TX15; 3Nm)

Garant Radius indexable inserts for radius cutter No. 216825

Application: General-purpose indexable insert, preferred for steel, high-alloy steels and cast iron. Optimised chip breaker for unobstructed chip flow.

Note: Can also be used on radius turning tool No. 294500.

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	Cast < 500 N	Cast < 750 N	Cast < 900 N	Cast < 1100 N	Cast < 1400 N	Cast < 55 HRC	Cast < 60 HRC	Cast < 65 HRC	Cast < 67 HRC	Cast < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni	Oil	Water	Chip	Chip	Chip
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
21 6841				390	300	220	160	90						280	180		110	●	●	●	●	●	●



Radius r			1	1,5	2	2,5	3	3,5	4	4,5	5	
21A	21 6841	Radius indexable insert	HB7525	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
f _r		mm	0.1 – 0.4									
L		mm	15									
B		mm	9.52									
S		mm	3.18									
suitable radius cutter			216825 1	216825 1	216825 1	216825 1	216825 2	216825 2	216825 2	216825 2	216825 2	

Garant Engraving and deburring system

2-cutter system with $t_{\max} = 2.0 \text{ mm}$

$\varnothing D_s, h_6$	mm	6
21Y 21 7202	Steel shank for engraving	eShop
21Y 21 7204	Carbide shank for engraving	eShop
L_{tot} (21 7202)	mm	40
L_{tot} (21 7204)	mm	60
Insert screw		219877 (T7; 0.9 Nm)
suitable indexable insert		217210 - 217216; 217234



4-cutter system with $t_{\max} = 0.8 \text{ mm}$

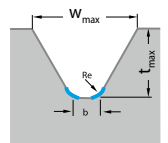
$\varnothing D_s$	mm	10
21Y 21 7225	Steel shank for engraving	eShop
L_{tot}	mm	90
Insert screw		231540_TX8 (2.0 Nm)
suitable indexable insert		217229



Garant Indexable inserts for engraving and deburring systems

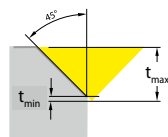
Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
21 7210/7215	180	140	100											40	30		60	●	●	○	○	○	○
21 7211/7216/7234				70	60	50	40										60		●	○	○	○	○
21 7229				80	60	50	30	20									80		●	○	○	○	○

Inserts for engraving for 2-cutter system



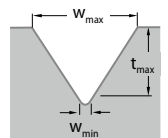
Type		ALU	UNI		Point angle degrees	R_e mm	Shoulder length b mm	$t_{\max}$ mm	$w_{\max}$ mm
21Y 21 7210	Insert for engraving	HU7805	eShop	10	45	0.08	0.4	2	2.06
21Y 21 7211		HB7525	eShop	10	45	0.08	0.4	2	2.06
21Y 21 7215		HU7805	eShop	10	60	0.08	0.4	2	2.71
21Y 21 7216		HB7525	eShop	10	60	0.08	0.4	2	2.71
f	mm	0.005-0.03	0.003-0.03						

Inserts for deburring for 2-cutter system



Type		UNI		$t_{\min}$ mm	$t_{\max}$ mm	Z
21Y 21 7234	Insert for deburring	HB7525	10	0.25	1.75	6
f	mm	0.005-0.03				

Inserts for engraving for 4-cutter system



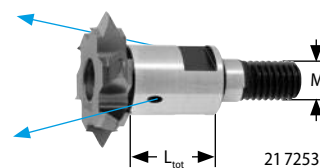
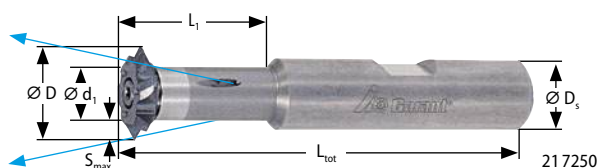
Type		UNI		Point angle degrees	$w_{\min}$ mm	$w_{\max}$ mm	$t_{\max}$ mm
21Y 21 7229	Insert for engraving	HB7525	2	90	0.25	1.8	0.8
f	mm	0.008 - 0.03					



Garant Circular mill for polygon milling inserts

21 7253 Size 16/M5; 27/M8 – **Extra-slim version** for thread milling.

Note: The actual groove depth S_{max} is calculated as follows: $(D-d_1) / 2$.



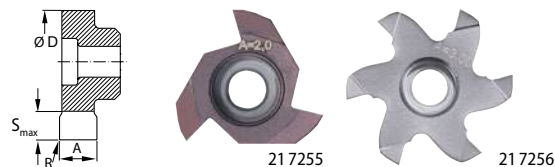
Type	21Q 21 7250	21Q 21 7252	21Q 21 7253	for insert type	Ø D	M	Ø d ₁	S _{max}	L ₁	L _{tot}	Ø D ₅ h6	Shank type	Set of insert screws
	Circular mill				mm	mm	mm	mm	mm	mm	mm		
12	eShop	—	—	P12	9.6 – 11.7	—	7	2.35	22	69.5	12	Weldon	219832 (8IP; 1.0 Nm)
12L	—	eShop	—	P12	9.6 – 11.7	—	7	2.35	32	82	12	cylindrical	219832 (8IP; 1.0 Nm)
12/M5	—	—	eShop	P12	9.6 – 11.7	M5	9.5	1.1	10	13.5	—	with thread	219832 (8IP; 1.0 Nm)
16/M5	—	—	eShop	P16	14 – 22	M5	9.5	6.5	15	18.5	—	with thread	219818 (8IP; 1.2 Nm)
18	eShop	eShop	—	P16	14 – 22	—	9	6.5	25	71.5	12	Weldon	219818 (8IP; 1.2 Nm)
18L	—	eShop	—	P16	14 – 22	—	12	5	37.4	86.5	12	cylindrical	219818 (8IP; 1.2 Nm)
18XL	—	eShop	—	P16	14 – 22	—	12	5	77.5	126.6	12	cylindrical	219818 (8IP; 1.2 Nm)
18/M6	—	—	eShop	P16	14 – 22	M6	11	5.5	15	18.5	—	with thread	219818 (8IP; 1.2 Nm)
27	eShop	—	—	P26	22 – 37	—	13.6	11.5	35	84.2	16	Weldon	219819 (20IP; 5.7 Nm)
27L	—	eShop	—	P26	22 – 37	—	15.5	10.75	25	109.6	16	cylindrical	219819 (20IP; 5.7 Nm)
27XL	—	eShop	—	P26	22 – 37	—	15.5	10.75	25	180	20	cylindrical	219819 (20IP; 5.7 Nm)
27/M8	—	—	eShop	P26	22 – 37	M8	13.6	11.5	18	22.6	—	with thread	219819 (20IP; 5.7 Nm)
27/M10	—	—	eShop	P26	22 – 37	M10	18	9.5	18	22.6	—	with thread	219819 (20IP; 5.7 Nm)

Garant Polygon milling inserts for circular mills No. 217250 / 217252 / 217253

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
21 7255–21 7346	500	400	250	250	180	120	120	100	60	45	35	30		120	120	80	180	●	●	●	●	●	●

Milling inserts, unprofiled, ground ready for use

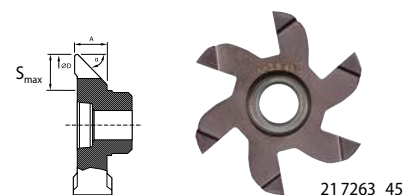
21 7259 – With extra-large groove depth S_{max}



Milling width A	mm	1	1,5	2	2,5	3	4	5	6,5		Type	Z
21C 21 7255	HB7720	—	eShop	eShop	eShop	eShop	—	—	—	3	P12	3
21C 21 7256	HB7720	—	eShop	eShop	eShop	eShop	eShop	eShop	—	3	P16	6
21C 21 7258	HB7720	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	3	P26	6
21C 21 7259	HB7720	eShop	eShop	eShop	eShop	eShop	—	—	—	3	P26	6
Radius R (21 7255, 21 7256, 21 7258)	mm	—	0.1	0.1	0.15	0.15	0.15	0.15	0.15			
Radius R (21 7259)	mm	0.15	0.15	0.15	0.15	0.15	—	—	—			
Ø D (21 7255)	mm	—	11.7	11.7	11.7	11.7	—	—	—			
Ø D (21 7256)	mm	—	17.7	17.7	17.7	16	16	16	—			
Ø D (21 7258)	mm	—	27.7	27.7	27.7	26	26	26	26			
Ø D (21 7259)	mm	37	37	37	37	37	—	—	—			

Milling inserts for dovetail grooves

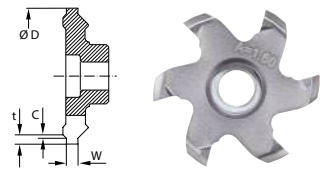
With trailing chamfer, suitable for face machining.



Angle α	degrees	30	45		Ø D mm	Type	Z
21C 21 7263	HB7720	eShop	eShop	3	16	P16	6
21C 21 7264	HB7720	eShop	eShop	3	26	P26	6
A (21 7263)	mm	4.5	3.6				
A (21 7264)	mm	6.1	5.9				
S _{max} (21 7263)	mm	2.45	3.3				
S _{max} (21 7264)	mm	3.4	5.6				

Milling inserts for retaining ring grooves, with chamfer

Type P16 / P26



21 7261

Nominal ring thickness	mm	1,3	1,6	1,85	2,15		Ø D mm	Type	Z
21 7261	HB7720	eShop	eShop	—	—	3	16	P16	6
21 7265	HB7720	—	—	eShop	eShop	3	26	P26	6
Slot width W —0.03	mm	1.38	1.68	1.93	2.23				
Depth t	mm	0.85	1	1.25	1.5				
Chamfer C	mm	0.15×45°	0.15×45°	0.2×45°	0.2×45°				

Milling inserts for retaining ring grooves, without chamfer

Type P12 / P16 / P26



21 7269

21 7270

Nominal ring thickness	mm	0,9	1,1	1,3	1,6	2,15	2,65	3,15		Ø D mm	Type	Z
21 7267	HB7720	eShop	—	—	—	—	—	—	3	9.6	P12	3
21 7269	HB7720	—	eShop	eShop	eShop	—	—	—	3	11.7	P12	3
21 7270	HB7720	—	—	eShop	eShop	—	—	—	3	16	P16	6
21 7275	HB7720	—	—	—	—	eShop	eShop	eShop	3	26	P26	6
Slot width W —0.03	mm	0.98	1.18	1.38	1.68	2.23	2.73	3.23				
Depth t for P12 (21 7267, 21 7269)	mm	1.2	0.9	1.1	1	—	—	—				
Depth t for P16/P26 (21 7270, 21 7275)	mm	—	—	1.1	1.25	1.75	1.75	2.2				
Radius R	mm				0.3							

90° milling inserts for chamfering and deburring

Type P12 / P16 / P26



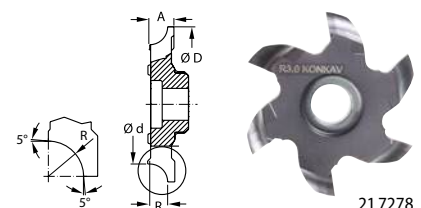
21 7277

21 7277

maximum milling depth S _{max}	21 7277		Ø D	Minimum tapping drill Ø	Type	Z
	Milling insert 90° for chamfering and deburring					
mm	HB7720		mm	mm		
1,2	eShop	3	9.6	12	P12	3
1,5	eShop	3	11.7	12	P12	3
1,9	eShop	3	16	18	P16	6
2,1	eShop	3	26	28	P26	6

Radius milling inserts

Type P26

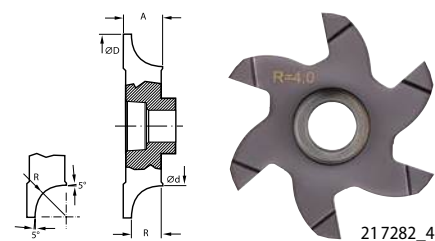


21 7278

Radius R	mm	0,5	1	1,5	2	2,5	3	4	5		Ø D mm	Type	Z
21 7278	Radius milling insert	HB7720	eShop	eShop	eShop	eShop	eShop	eShop	eShop	3	26	P26	6
A	mm	3	3	4	4	4	4	6.5	6.5				
Ø d	mm	25	24	23	22	21	20	18	16				

Radius milling inserts, reverse machining

Type P26

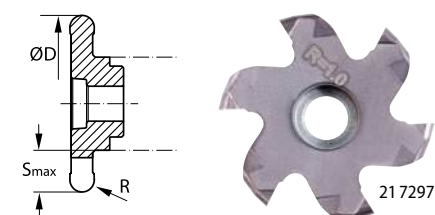


21 7282_4

Radius R	mm	0,5	1	1,5	2	2,5	3	4	5		Ø D mm	Type	Z
21C 21 7282	Radius milling insert	HB7720	eShop	eShop	eShop	eShop	eShop	eShop	eShop	3	26	P26	6
A	mm	3	3	3	3	4	5	6.5	6.5				
Ø d	mm	24.3	23.3	22.3	21.3	20.3	19.3	17.3	15.7				

Full radius milling inserts

Type P16 / P26



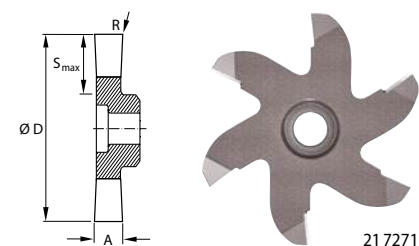
21 7297

Radius R			mm	1	1,5	2	2,5		Ø D mm	Type	Z
21C 21 7297	Full radius milling insert	HB7720		eShop	eShop	eShop	eShop	3	16	P16	6
Radius R			mm	1	1.5	2	2.5				
S _{max}			mm	2	3.5	3.5	3.5				

Radius R			mm	1,5	2	2,5	3		Ø D mm	Type	Z
21C 21 7298	Full radius milling insert	HB7720		eShop	eShop	eShop	eShop	3	26	P26	6
Radius R			mm	1.5	2	2.5	3				
S _{max}			mm	6.2							

Milling inserts for parting off, with staggered toothing

Type P26



21 7271

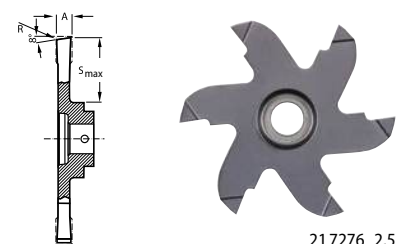
Milling width A	mm	1	1,5	2	2,5	3		Ø D mm	Type	Z
21C 21 7271	Milling inserts for parting off, with staggered toothing	HB7720	eShop	eShop	eShop	eShop	3	37	P26	6
Radius R	mm			0.15						
S _{max}	mm			11.5						

Milling inserts for parting off, with 8° bevel

Type P26

Note:

The 8° bevel facilitates process reliability when parting off components and helps to avoid vibration. Furthermore, it makes manual parting-off easier.



21 7276_2,5

Additional size

Milling width A			mm	1,5	2	2,5		∅ D mm	Type	Z
21C	21 7276	Milling insert for parting off, with 8° bevel	HB7720	eShop	eShop	eShop	3	37	P26	6
Radius R			mm	0.1						
S _{max}			mm	11.5						

Milling inserts for thread undercuts similar to DIN76-1

Type P12 / P16 / P26



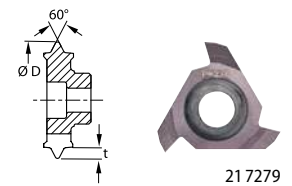
Pitch	mm	1-1,5	1,75-2,5	3-3,5		Ø D mm	Type	Z
21 7272	Milling insert for metric thread undercuts	eShop	—	—	3	11.7	P12	3
21 7273		eShop	eShop	—	3	16	P16	6
21 7274		—	—	eShop	3	26	P26	6
G (21 7272, 21 7274)	mm	17	—	3.6				
G (21 7273)	mm	2,2	2.9	—				
Depth t (21 7272, 21 7274)	mm	1.1	—	2.3				
Depth t (21 7273)	mm	1.5	1.7	—				
Radius R	mm	0.7	1.1	1.6				

60° milling inserts for thread milling

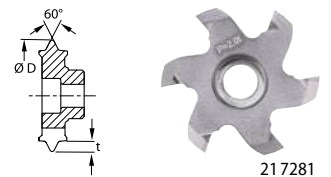
Type P12 / P16 / P26



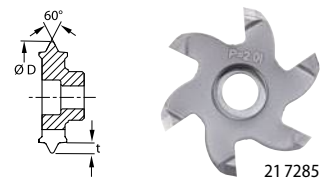
Note: **Corrected profile threading inserts** eliminate the need to program a correction to the diameter. Therefore use these inserts only for the specified thread sizes.
When using the circular mill No. 217252 size 18L and 18XL, the partial profile insert No. 217281 size 1–4 can be used only up to pitch 3.0.



Pitch	mm	1	1,5	2	1-3		Type	Z
21 7279	Milling insert 60°	eShop	eShop	eShop	eShop	3	P12	3
Insert geometry		Full profile	Full profile	Full profile	Partial profile			
Application		Internal	Internal	Internal	Internal and external			
Ø D	mm	9.6	9.6	10.5	11.7			
Depth t	mm	0.57	0.88	1.16	1.81			
for threads ≥		M12×1	M14×1.5	M16×2	M14×1; M16×1.5			



Pitch	mm	1,5	2	2,5	M20×2,5	3	1-4	2,5-4		Type	Z
21 7281	Milling insert 60°	eShop	eShop	eShop	eShop	eShop	eShop	eShop	3	P16	6
Insert geometry		Full profile	Full profile	Full profile	Full profile	Full profile	Partial profile	Partial profile			
Application		Internal	Internal	Internal	Internal	Internal	Internal and external	Internal and external			
Ø D	mm				16						
Depth t	mm	0.864	1.159	1.444	1.444	1.702	2.308	2.6			
for threads ≥		M20×1.5	M22×2	M24×2.5	only M20×2.5/ M22×2.5 corrected profile	M27×3	M20	M22			



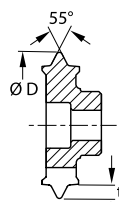
Pitch	mm	1,5	2	3	3,5	M30×3,5	4	M36×4	4,5	5	1-3	2,5-5		Type	Z
21 7285	Milling insert 60°	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	3	P26	6
Insert geometry		Full profile	Full profile	Full profile	Full profile	Full profile	Full profile	Full profile	Full profile	Full profile	Partial profile	Partial profile			
Application		Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal and external	Internal and external			
Ø D	mm	26	26	26	26	24	26	26	26	26	26	26			
Depth t	mm	0.864	1.159	1.728	2.023	2.023	2.262	2.262	2.602	2.887	3.7	3.2			
for threads ≥		M30×1.5	M33×2	M39×3	M36×3.5	only M30×3.5/ M33×3.5 corrected profile	M36×4	only M36- M54×4 corrected profile	M42×4.5	M48×5	M32	M36			

55° milling inserts for thread milling

Type P12 / P16 / P26



21 7295 Size 11 – For thread >1 inch.



21 7288

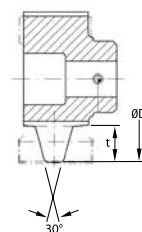


21 7290

Threads per inch			11	14	19		Type	Z	
21C	21 7288	Milling insert 55°	HB7720	–	–	eShop	3	P12	3
21C	21 7290		HB7720	eShop	eShop	–	3	P16	6
21C	21 7295		HB7720	eShop	–	–	3	P26	6
Insert geometry			Full profile						
Application			Internal and external						
Ø D (21 7288, 21 7290)		mm	16	16	9.6				
Ø D (21 7295)		mm	26	–	–				
Depth t (21 7288, 21 7290)		mm	1.494	1.179	0.87				
Depth t (21 7295)		mm	1.478	–	–				

30° milling inserts for thread milling

Type P12 / P16 / P26

**Note:** Do not use with circular mill No. 217252 size 27L.

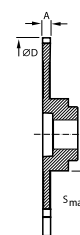
21 7302

Pitch		mm	2	3	5	6	7	8		Type	Z	
21C 21 7302	Milling insert 30°	HB7720	eShop	–	–	–	–	–	3	P12	3	
21C 21 7305		HB7720	–	eShop	–	–	–	–	3	P12	3	
21C 21 7308		HB7720	–	eShop	–	–	–	–	3	P16	3	
21C 21 7311		HB7720	–	–	eShop	–	–	–	3	P26	3	
21C 21 7314		HB7720	–	–	–	eShop	–	–	3	P16	3	
21C 21 7317		HB7720	–	–	–	eShop	–	–	3	P16	3	
21C 21 7321		HB7720	–	–	–	–	eShop	–	3	P26	3	
21C 21 7324		HB7720	–	–	–	–	–	eShop	3	P26	3	
21C 21 7327		HB7720	–	–	–	–	–	eShop	3	P26	3	
Insert geometry			Full profile									
Application			Internal									
Ø D (21 7302, 21 7305, 21 7311, 21 7314, 21 7317, 21 7321, 21 7324, 21 7327)			mm	11.7	11	25	16.2	22	25			
Ø D (21 7308)			mm	–	14	–	–	–	–			
Depth t			mm	1.25	1.75	2.75	3.5	4	4.5			
for threads ≥ (21 7302, 21 7305, 21 7311, 21 7314, 21 7321, 21 7324)				Tr16×2 – Tr20×2	Tr18×3 – Tr20×3	Tr44×5 – Tr48×5	Tr30×6 – Tr32×6	Tr38×7 – Tr42×7	Tr46×8 – Tr48×8			
for threads ≥ (21 7308, 21 7317, 21 7327)				–	Tr24×3 – Tr32×3	–	Tr34×6 – Tr42×6	–	Tr50×8 – Tr52×8			

Milling inserts for parting off, high number of cutting edges

Type P16/P26

For particularly high feed rates. Ideal for effective series production.

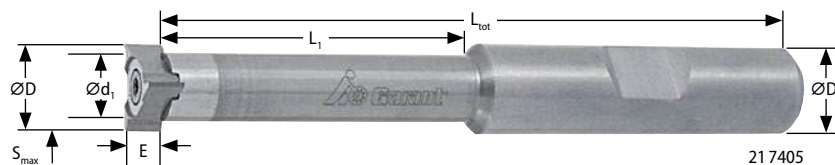


21 7344_1,5

Milling width A			mm	1,5		Ø D mm	Type	Z
21C	21 7344	HB7720	eShop					
	Milling insert for parting off, high number of cutting edges							
21C	21 7346	HB7720	eShop		3	37	P26	9
S _{max} (21 7344)			mm	6.4				
S _{max} (21 7346)			mm	11.5				

Garant Circular mills for triangular milling inserts

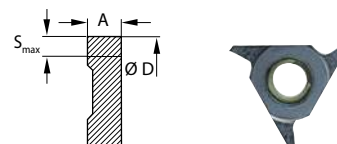
No. 217400 sizes 8 and 11 as well as No. 217405 size 11L without internal cooling.



Type	21Q	21 7400	21Q	21 7405	for insert type	Ø D	Ø d ₁	S _{max}	L ₁	L _{tot}	Ø D ₁ h6	Shank type	Set of insert screws
	Circular mill (without insert)												
	Steel		Carbide										
8	eShop	—	04	7.9	7.1	0.35	17.2	57.2	10	Weldon	219820 (6 IP; 0.6 Nm)		
11	eShop	—	03	10.6	7.4	1.6	17.2	57.2	10	Weldon	219820 (6 IP; 0.6 Nm)		
20	eShop	—	02	17.5	12.2	2.6	28.7	74.05	12	Weldon	219821 (15 IP; 3.0 Nm)		
25	eShop	—	01	23	16	3.45	38.5	87	16	Weldon	219822 (20 IP; 5.0 Nm)		
25L	eShop	—	01	23	16	3.45	67.5	116	16	Weldon	219822 (20 IP; 5.0 Nm)		
11L	—	eShop	03	10.6	7.4	1.6	34.2	74.2	10	Weldon	219820 (6 IP; 0.6 Nm)		
11XL	—	eShop	03	10.6	8	1.25	—	77.66	8	cylindrical	219820 (6 IP; 0.6 Nm)		
20XL	—	eShop	02	17.5	12.2	2.6	—	121.5	12	cylindrical	219821 (15 IP; 3.0 Nm)		
20L	—	eShop	02	17.5	12.2	2.6	63.7	108.7	12	Weldon	219821 (15 IP; 3.0 Nm)		
25XL	—	eShop	01	23	16	3	—	148.58	16	cylindrical	219822 (20 IP; 5.0 Nm)		

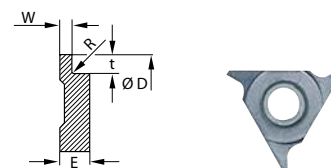
Garant Triangular milling inserts for circular mills No. 217400 / 217405

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si									INOX	INOX	Ti	G(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K					
21 7420–21 7462	600	500	400	260	220	180	100	80	60	45	35	30	130	120	100	120	●	●	●	●	●	
21 7490–21 7510	600	500	400	260	220	180	100	80	60	45	35	30	130	120	100	120	●	●	●	○	○	



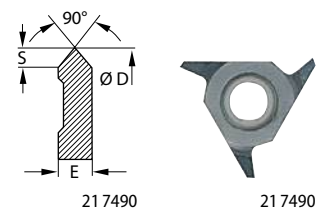
21 7420

Milling width A		mm	2,34	3	3,5	4		Ø D mm	Type	Z
21C	21 7420	HB7720	eShop	eShop	–	–	10	10.6	03	3
21C	21 7424	HB7720	–	–	eShop	–	5	17.5	02	3
21C	21 7428	HB7720	–	–	–	eShop	5	23	01	3
S _{max}		mm	1.6	1.6	2.6	3.45				



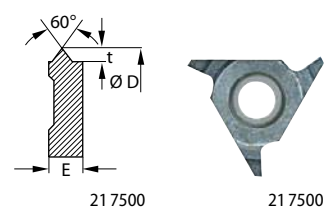
21 7450

Nominal ring thickness		mm	0,9	1,1	1,3	1,6	1,85	2,15	2,65	3,15		Ø D mm	E mm	Type	Z	
21C	21 7450	Milling inserts for retaining ring grooves without chamfer	HB7720	eShop	–	–	–	–	–	–	10	7.9	2.34	04	3	
21C	21 7454		HB7720	–	eShop	eShop	–	eShop	–	–	10	10.6	2.34	03	3	
21C	21 7458		HB7720	–	eShop	eShop	eShop	–	–	eShop	eShop	5	17.5	3.5	02	3
21C	21 7462		HB7720	–	–	–	eShop	–	eShop	eShop	eShop	5	23	4	01	3
Slot width W —0.03		mm	0.98	1.18	1.38	1.68	1.93	2.23	2.73	3.23						
Depth t		mm	0.3	0.9	1.1	1.25	1.25	1.75	1.75	2.2						
Radius R		mm	0.3													

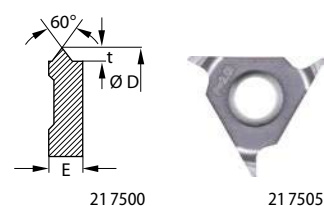


maximum milling depth S_{max}	21 7490		Insert thickness E	Ø D	Type	Z
	Milling insert 90°					
mm	HB7720		mm	mm		
0,9	eShop	10	2.34	7.9	04	3
1,5	eShop	10	3	10.6	03	3
2,5	eShop	5	5	17.5	02	3
3,25	eShop	5	6.5	23	01	3

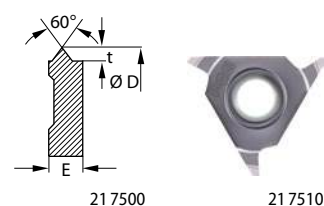
60° milling inserts for thread milling



Pitch		mm	1,5	2		Type	Z
21 7500	Milling insert 60°	HB7720	eShop	eShop	10	03	3
Insert geometry			Full profile Internal				
Ø D	mm		10.6				
Depth t	mm	0.864	1.159				
Insert thickness E	mm		2.34				
for threads >			M16				



Pitch	mm	1,5	2	M20×2,5	2,5	3	1-3,5		Type	Z
21 7505	Milling insert 60°	HB7720	eShop	eShop	eShop	eShop	eShop	5	02	3
Insert geometry		Full profile Internal	Full profile Internal	Full profile Internal	Full profile Internal	Full profile Internal	Partial profile Internal and external			
Ø D	mm	17.5	17.5	16	17.5	17.5	17.5			
Depth t	mm	0.864	1.159	1.444	1.444	1.728	0.578 - 2.023			
Insert thickness E	mm			3.5						
for threads ≥		M24×1.5	M24×2	only M20×2.5 corrected profile	M24×2.5	M24×3	M22			



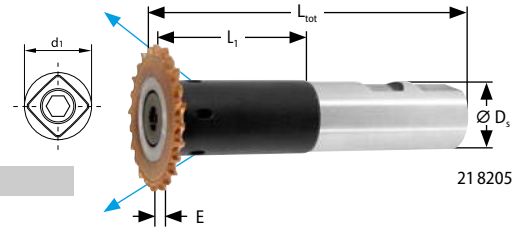
Pitch		mm	2	3,5		Type	Z
21 7510	Milling insert 60°	HB7720	eShop	eShop	5	01	3
Insert geometry			Full profile Internal				
Ø D		mm	23				
Depth t		mm	1.159	2.023			
Insert thickness E		mm	4				
for threads ≥			M30×2	M33×3.5			



mimatic PolySAW-G / DeepMILL-G

Saw blades secured by a single screw in the centre. **Quadrogon interface** for improved torque transmission and torsional stiffness.

Supplied with: Supplied with clamping washer and clamping screw.



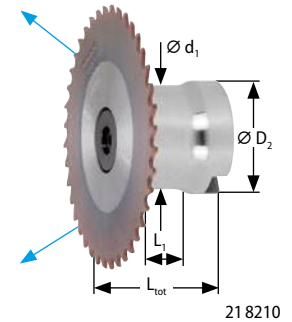
PolySAW-G / DeepMILL-G basic holders with Weldon shank

Type	21 8205	$\varnothing d_1$	L_1	L_{tot}	$\varnothing D_s$ h6	Clamping washer	Clamping screw
	Toolholder	mm	mm	mm	mm		
	Weldon shank						
09/16	eShop	16.8	35	92	20	—	219834 (SW3; 3.8 Nm)
11/18	eShop	18.8	40	97	20	—	219835 (SW3; 10.5 Nm)
13/21	eShop	21.6	45	111	25	—	219836 (4AF; 24.5 Nm)
16/26	eShop	26	50	116	25	219845	219837 (SW3; 6.0 Nm)
19/30	eShop	30	55	128	32	219846	219838 (SW3; 10.5 Nm)
25/38	eShop	38.2	60	133	32	219847	219839 (SW4; 24.5 Nm)

PolySAW-G basic holders with bore

Application: With combination face mill adapter.
Only with PolySAW-G saw blades.

Type	21 8210	$\varnothing d_1$	$\varnothing d_2$	L_1	L_{tot}	Mounting bore $\varnothing$	Clamping washer	Clamping screw
	PolySAW toolholder	mm	mm	mm	mm	mm		
	with bore							
16/26	eShop	26	32	20	42.5	16	219845	219837 (SW3; 6.0 Nm)
19/30	eShop	30	32	20	42.5	16	219846	219838 (SW3; 10.5 Nm)



mimatic PolySAW-G saw blades / DeepMILL-G milling discs

Note: Standard application values for a_e max.

a_e / D	25 %	20 %	15 %	10 %
f_z factor	0.85	0.9	1.00	1.15

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G) CRP	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
21 8220/8224/ 8230–21 8236	300	200	150	160	120	100								100	80		120						
21 8222/8226	600	500	400																				

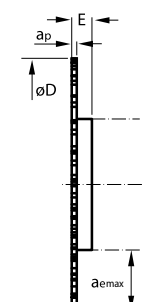
PolySAW-G saw blades

For parting off, sawing, and slitting.
PolySAW-G permits cutting to the full depth.

Also available with DLC coating



$\varnothing D$	21 8220	21 8222	21 8224	21 8226	Type of toolholder	Number of cutting edges Z	Insert width E	$a_{e\max}$
	Width $a_p = 1$ mm TiAlN	Width $a_p = 1$ mm TiAlN	Width $a_p = 1.5$ mm TiAlN	Width $a_p = 1.5$ mm TiAlN		21 8220 21 8224	21 8222 21 8226	mm
mm								mm
32	eShop	eShop	eShop	eShop	09/16	18	16	7.6
40	eShop	eShop	eShop	eShop	11/18	24	20	10.5
50	eShop	eShop	eShop	eShop	13/21	32	20	14.2
63	eShop	eShop	eShop	eShop	16/26	40	24	18.5
80	eShop	eShop	eShop	eShop	19/30	40	24	25
f_z mm	0.015	0.02	0.02	0.025				

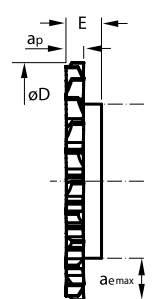


Deep-MILL-G milling discs

Slot milling, grooving, ribbed structures.
DeepMILL-G permits cutting to the full depth.



Ø D	29C	21 8230	29C	21 8232	29C	21 8234	29C	21 8236	Type of toolholder	Number of ef- fective inserts Z _{eff}	Number of cutting edges Z	Insert width E	a _{e max}
	Milling disc DeepMILL-G												
	Width a _p = 2 mm		Width a _p = 3 mm		Width a _p = 4 mm		Width a _p = 5 mm						
	TiAlN		TiAlN		TiAlN		TiAlN						
mm												mm	mm
32		eShop		eShop		eShop		eShop	11/18	8	16	6	6.6
40		eShop		eShop		eShop		eShop	13/21	9	18	6	9.2
50		eShop		eShop		eShop		eShop	16/26	12	24	6	12
63		eShop		eShop		eShop		eShop	19/30	12	24	6	16.5
80		eShop		eShop		eShop		eShop	25/38	12	24	6	20.9
f _z mm		0.025		0.025		0.03		0.03					





Garant T-slot cutter for SP.T 0603.. / 09T3.. / 1204..

End mill with clamping face and internal coolant supply. Deeply recessed at the cutting area to allow working in very deep slots. Anti-corrosion surface treatment.

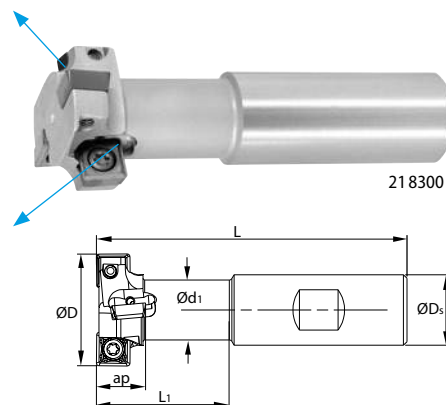
Application: For slots to DIN 650.

Note: Coolant feed via the internal coolant supply is preferable in order to achieve optimum chip clearance.

Size 50/2 – Use GARANT torque screwdriver TQ No. **211750 size 5.7** with bit No. **674252 size 20IP**.

Size 21/1; 25/2 – Use GARANT torque screwdriver TQ No. **211750 size 1.2** with bit No. **674252 size 8IP**.

Size 32/2; 40/2 – Use GARANT torque screwdriver TQ No. **211750 size 3.0** with bit No. **674252 size 15IP**.



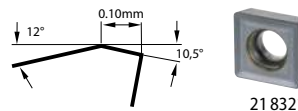
Ø D / Z _{eff}	210	21 8300	Number of effective inserts Z _{eff}	Number of indexable inserts	Slot depth a _p	Ø d ₁	L ₁	L _{tot}	Ø D _s h6	suitable indexable insert	Set of insert screws
mm		T-slot cutter Weldon shank			mm	mm	mm	mm	mm		
21/1		eShop	1	2	9	11	26	76	16	SPT 060304	219840 (8IP; 1.2 Nm)
25/2		eShop	2	4	11	13	31	82	16	SPT 060304	219840 (8IP; 1.2 Nm)
32/2		eShop	2	4	14	17	38	88	20	SPT 09T308	219841 (15IP; 3.0 Nm)
40/2		eShop	2	4	17	21	50	108	25	SPT 09T308	219841 (15IP; 3.0 Nm)
50/2		eShop	2	4	22	27	56	120	32	SPT 120408	219848 (20IP; 5.5 Nm)

Garant Milling inserts SP.T 0603.. / 09T3.. / 1204..

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10% Si										INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K					
HU7815	750	700	600																			
HB7035				220	200	180	140	120					180	160		170	●		●		○	○



21 8305



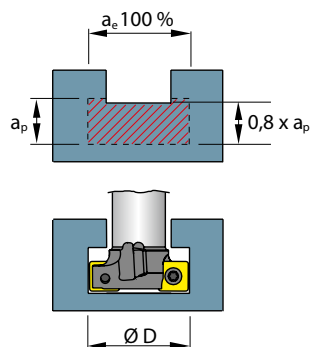
21 8321

Type		ALU	UNI	
21A 21 8305	SPGT 060304	HU7815	eShop	10
21A 21 8321	SPMT 060304	HB7035	eShop	10
21A 21 8325	SPGT 09T308	HU7815	eShop	10
21A 21 8341	SPMT 09T308	HB7035	eShop	10
21A 21 8345	SPGT 120408	HU7815	eShop	10
21A 21 8361	SPMT 120408	HB7035	eShop	10
f _t (21 8305, 21 8321)	mm	0.12	0.09	
f _t (21 8325, 21 8341)	mm	0.14	0.11	
f _t (21 8345, 21 8361)	mm	0.15	0.12	

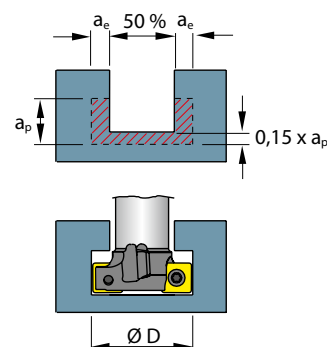
Application notes for T-slot cutter No. 21 8300



**T-slot milling
in the case of
a_e = 100%**



**T-slot milling
in the case of
a_e = 50%**



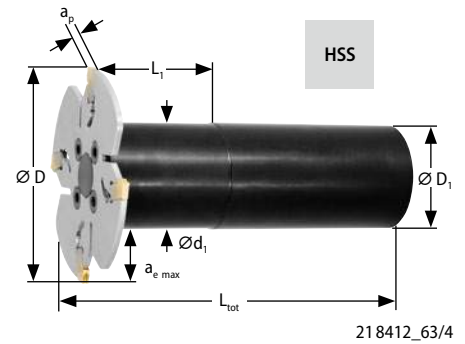
Garant Side / parting off milling cutter for clamped inserts

High-performance parting-off milling cutter system with choice of either collar and **low-cost steel blade** or collar and **high-precision temperature-resistant HSS blade**.

Application: For slitting and parting off milling. For high repetition accuracy in series production it is preferable to use the HSS blade.

Attention: Please order the assembly key No. 279940 separately.

Note: Side and parting-off milling cutters available up to $\varnothing D = 200$ mm.
HSS spare blades can be reordered as accessories.

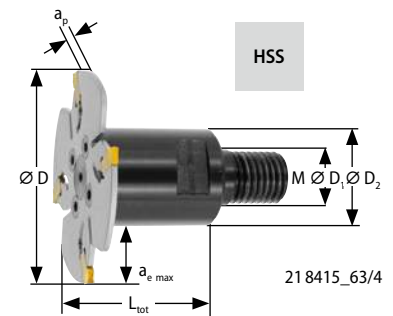


Side / parting off milling cutter with plain shank

Ø D / num- ber of teeth Z	21P 21 8408	21P 21 8410	21P 21 8412	21P 21 8414	a _{e max}	Ø d ₁	L ₁	L _{tot} a _p 1.5 mm	L _{tot} a _p 2.2 mm	Ø D ₅ h6
	Side / parting off milling cutter with plain shank									
mm	HSS width a _p = 1.5 mm	Steel width a _p = 1.5 mm	HSS width a _p = 2.2 mm	Steel width a _p = 2.2 mm	mm	mm	mm	mm	mm	mm
50/4	eShop	eShop	eShop	eShop	12.75	24.5	36	94.9	95.5	25
63/4	eShop	eShop	eShop	eShop	15.75	31.5	37	99.9	100.5	32

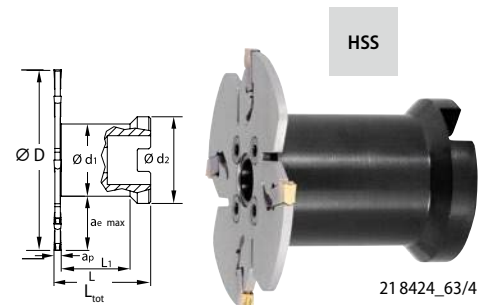
Side / parting off milling cutter with thread

Specially for use in deep cavities.



Ø D / number of effective cutting edges Z	21P 21 8415	21P 21 8416	21P 21 8417	21P 21 8418	a _{e max}	Ø D ₁ h6	L _{tot} a _p 1.5 mm	L _{tot} a _p 2.2 mm	Ø D ₂	Mounting thread M
	Side / parting off milling cutter with thread									
	HSS width a _p = 1.5 mm	Steel width a _p = 1.5 mm	HSS width a _p = 2.2 mm	Steel width a _p = 2.2 mm						
mm					mm	mm	mm	mm	mm	
50/4	eShop	eShop	eShop	eShop	12.75	12.5	31.4	32	25	M12
63/4	eShop	eShop	eShop	eShop	15.75	17	33.4	40	29	M16

Side / parting off milling cutter with collar



Ø D / number of teeth Z	21P	21P	21P	21P	21P	21P	a _{e max}	Ø d ₁	Ø d ₂	L ₁	L _{tot} a _p 1.5 mm	L _{tot} a _p 2.2 mm	L _{tot} a _p 3.1 mm	Mounting bore Ø
	21 8420	21 8422	21 8424	21 8426	21 8428	21 8430								
	Side / parting off milling cutter with collar													
mm	HSS width a _p = 1.5 mm	Steel width a _p = 1.5 mm	HSS width a _p = 2.2 mm	Steel width a _p = 2.2 mm	HSS width a _p = 3.1 mm	Steel width a _p = 3.1 mm	mm	mm	mm	mm	mm	mm	mm	mm
63/4	eShop	eShop	eShop	eShop	eShop	eShop	15.5	32	40	38	51.4	52	52.8	22
80/5	eShop	eShop	eShop	eShop	eShop	eShop	20	40	40	—	51.4	52	52.8	22
100/8	eShop	eShop	eShop	eShop	eShop	eShop	26	48	48	—	51.4	52	52.8	27
125/10	eShop	eShop	eShop	eShop	eShop	eShop	33.5	58	58	—	64.4	65	65.8	32
160/15	—	—	eShop	eShop	eShop	eShop	40	80	80	—	—	65	65.8	40

HSS

Ø D / number of teeth Z	21P	21 8440	21P	21 8442	21P	21 8444	Set of fastening screws
	Blade						
	HSS width a _p = 1.5 mm		HSS width a _p = 2.2 mm		HSS width a _p = 3.1 mm		
mm							
63/4	eShop		eShop		eShop		219985
80/5	eShop		eShop		eShop		219985
100/8	eShop		eShop		eShop		219985
125/10	eShop		eShop		eShop		219985
160/15	—		eShop		eShop		219985



21 8440_125/10

Garant Carbide inserts for side milling cutters No. 218408 – 218444 and parting-off blades No. 273560

Note: Standard application values for a_e max.

a_e / D	25%	20%	15%	10%
f. factor	1.0	1.15	1.25	1.5

**See page 861
for suitable
parting-off tools**

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
ALU	530	495	415																●				
ST900				230	190	170	135												●				
UNI				210	150	150	115												●				
INOX														110 120	90 100		145		●				

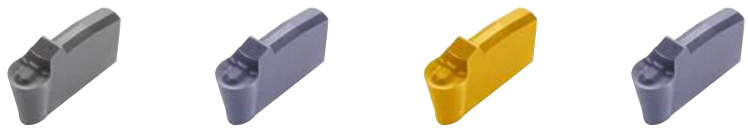
Cutter insert, neutral



Type		ALU	ST900	INOX	UNI	
21B 21 8450	Insert Width 1.5 mm	eShop	eShop	–	eShop	10
21B 21 8460	Insert Width 2.2 mm	eShop	eShop	eShop	eShop	10
21B 21 8470	Insert Width 3.1 mm	eShop	eShop	eShop	eShop	10
Corner radius (21 8450)	mm	0.15	0.15	–	0.15	
Corner radius (21 8460, 21 8470)	mm		0.2			
Type		HU7810	HB7535	HB7635	HB7535	
f _z	mm	0.13	0.1	0.07	–	
Tolerance a _n	mm		0 / + 0.3			

Cutter insert, full radius

Note:
21 8482/8484 – Suitable for side/parting off milling
cutters $a_p = 3.1$ mm.



Type		ALU	ST900	INOX	UNI	
21B 21 8478	Cutter insert Full radius width 1.5 mm	eShop	eShop	eShop	eShop	10
21B 21 8480	Cutter insert Full radius width 2.2 mm	eShop	eShop	eShop	eShop	10
21B 21 8482	Cutter insert Full radius width 3 mm	eShop	eShop	eShop	eShop	10
21B 21 8484	Cutter insert Full radius width 4 mm	eShop	eShop	eShop	eShop	10
Type		HU7810	HB7535	HB7635	HB7535	
f _z	mm	0.13	0.1	0.7	—	
Tolerance a _c	mm	0 / +0.3				

Garant Assembly key No. 27 9940 size 1–3

For side / parting off milling cutters.



27 9940 1-3



Garant Side milling cutters for screw-on indexable inserts

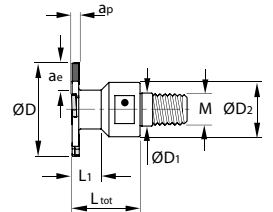
Side milling cutters of robust special steel for reduced vibration.

Application: For milling grooves and slots. For flat or non-flat slot base.

Note: Side milling cutters available up to $\varnothing D = 200$ mm.



21 8542_63



Side milling cutter with thread

Note:

21 8544 – Use GARANT torque screwdriver TQ No. **211750 size 2.2** with bit No. **674252 size IP15**.

21 8540/8542 – Use GARANT torque screwdriver TQ No. **211750 size 2.2** with bit No. **674252 size IP9**.

Ø D	210	210	210	Number of effective inserts Z _{eff}		Number of indexable inserts		a _e max	Ø D ₁ h6	L ₁	L _{tot}	Ø D ₂	Mounting thread M
	21 8540	21 8542	21 8544	Side milling cutter with thread									
				21 8540 21 8542	21 8544	21 8540 21 8542	21 8544						
mm	Width a _p = 4 mm	Width a _p = 5 mm	Width a _p = 6 mm					mm	mm	mm	mm	mm	
50	eShop	eShop	eShop	2	2	4	4	14	17	15	35	29	M16
63	eShop	eShop	eShop	4	3	8	6	14	17	—	35	29	M16
80	eShop	eShop	eShop	5	4	10	8	22.5	17	—	35	29	M16
ISO code indexable insert	SN..1102	SN..1103	SN..1203										
Set of insert screws	219948 (IP9; 2.0 Nm)	219949 (IP9; 2.0 Nm)	219950 (IP15; 2.2 Nm)										

Side milling cutter with collar

Attention:

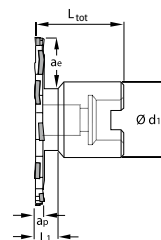
21 8568/8569 – To obtain a flat slot base, please use neutral, left-hand and right-hand indexable inserts, where the neutral insert is mounted on the middle insert range.

Note:

21 8560 – Use GARANT torque screwdriver TQ No. **211750 size 2.2** with bit No. **674252 size IP9**.

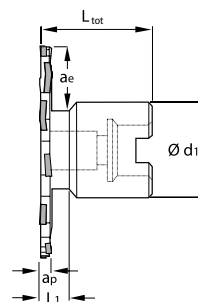
21 8562 – Use GARANT torque screwdriver TQ No. **211750 size 2.2** with bit No. **674252 size IP9**.

21 8564–8569 – Use GARANT torque screwdriver TQ No. **211750 size 2.2** with bit No. **674252 size IP15**.



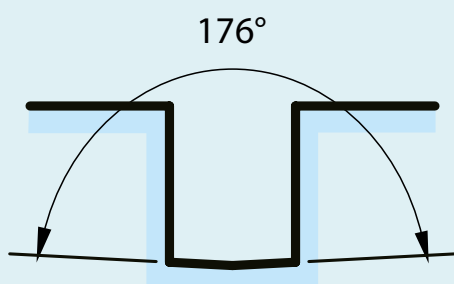
21 8560

Ø D	210	210	210	210	Number of effective inserts Z _{eff}		Number of indexable inserts		a _{e max}	Ø d ₁	L ₁	L _{tot}	Mounting bore Ø
	Side milling cutter with collar				21 8560 21 8562	21 8564 21 8565	21 8560 21 8562	21 8564 21 8565					
mm	Width a _p = 4 mm	Width a _p = 5 mm	Width a _p = 6 mm	Width a _p = 8 mm					mm	mm	mm	mm	mm
50	eShop	eShop	eShop	eShop	2	2	4	4	8.5	32	15	50	16
63	eShop	eShop	eShop	eShop	4	3	8	6	10.5	40	15	50	22
80	eShop	eShop	eShop	eShop	5	4	10	8	20	40	15	50	22
100	eShop	eShop	eShop	eShop	6	5	12	10	24.2	48	—	50	27
125	eShop	eShop	eShop	eShop	6	6	12	12	23.7	70	—	50	40
125L	eShop	eShop	eShop	eShop	6	6	12	12	29.7	59	—	50	32
160	eShop	eShop	eShop	eShop	8	8	16	16	41.2	70	—	50	40
ISO code indexable insert	SN.. 1102	SN.. 1103	SN.. 1203	SN.. 12045									
Set of insert screws	219948 (IP9; 2.0 Nm)	219949 (IP9; 2.0 Nm)	219950 (IP15; 2.2 Nm)	219978 (IP15; 2.2 Nm)									



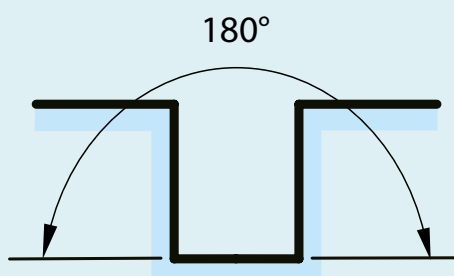
Ø D	210 21 8566	210 21 8567	210 21 8568	210 21 8569	Number of effective inserts Z_{eff}		Number of indexable inserts		$a_{e\ max}$	Ø d ₁	L ₁	L _{tot}	Mounting bore Ø
	Side milling cutter with collar				21 8566 21 8567	21 8568 21 8569	21 8566 21 8567	21 8568 21 8569	mm	mm	mm	mm	mm
mm	Width a _p = 10 mm	Width a _p = 12 mm	Width a _p = 14 mm	Width a _p = 16 mm									
50	eShop	eShop	—	—	2	—	4	—	8.5	32	15	50	16
63	eShop	eShop	—	—	3	—	6	—	10.5	40	15	50	22
80	eShop	eShop	eShop	eShop	4	2	8	6	20	40	15	50	22
100	eShop	eShop	—	—	5	—	10	—	24.2	48	—	50	27
125	eShop	eShop	eShop	eShop	6	4	12	12	23.7	70	—	50	40
125L	eShop	eShop	—	—	6	—	12	—	29.7	59	—	50	32
160	eShop	eShop	eShop	eShop	8	5	16	15	41.2	70	—	50	40
ISO code indexable insert	SN.. 1205	SN.. 1207	SN.. 1205	SN.. 1207									
Set of insert screws	219983 (IP15; 2.2 Nm)	219984 (IP15; 2.2 Nm)	219983 (IP15; 2.2 Nm)	219984 (IP15; 2.2 Nm)									

Garant Slot base



Non-flat slot base (176°).

Use of neutral indexable inserts.



Flat slot base (180°).

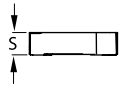
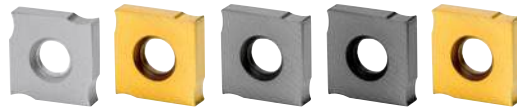
Use of left- and right-hand indexable inserts.

Garant Carbide indexable inserts for side milling cutters No. 218540 – 218569

Note: Standard application values for a_p max.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
ALU	800	650	500																				
ST900				200	180	170																	
ST1400						200	180	170															
INOX														120	100								
UNI					180	170	160							110	90								

Indexable inserts, neutral, for slot base 176° (not flat)



Type		ALU	ST900	ST1400	INOX	UNI		Insert thickness mm	for slot width a_p mm
21A 21 8571	SNHX 1102 neutral	eShop	eShop	eShop	eShop	eShop	10	2.3	4
21A 21 8581	SNHX 1103 neutral	eShop	eShop	eShop	eShop	eShop	10	2.7	5
21A 21 8591	SNHX 1203 neutral	eShop	eShop	eShop	eShop	eShop	10	3.2	6
21A 21 8601	SNHX 12045 neutral	eShop	eShop	eShop	eShop	eShop	10	4.5	8
21A 21 8611	SNHX 1205 neutral	eShop	eShop	eShop	eShop	eShop	10	5.4	10; 14
21A 21 8621	SNHX 1207 neutral	eShop	eShop	eShop	eShop	eShop	10	7	12; 16
Type		HU7710	HB7525	HB7525	HB7535	HB7525			
f_z	mm	0.1	0.08	0.13	0.13	—			
Chamfer width (21 8571, 21 8581)	mm	0.1	0.15	0.15	0.15	0.15			
Chamfer width (21 8591, 21 8601)	mm			0.25					
Chamfer width (21 8611)	mm	0.3	0.25	0.25	0.25	0.25			
Chamfer width (21 8621)	mm	0.45	0.25	0.25	0.25	0.25			

Indexable inserts, left and right, for slot base 180° (flat)

Note: To machine a flat slot base, left and right inserts must be mounted on the carrier.
The side facing away from the shank is equipped with left inserts.

Type		UNI		Insert thickness mm	for slot width a_p mm
21A 21 8573	SNHX 1102 left-hand	eShop	10	2.3	4
21A 21 8583	SNHX 1103 left-hand	eShop	10	2.7	5
21A 21 8593	SNHX 1203 left-hand	eShop	10	3.2	6
21A 21 8603	SNHX 12045 left-hand	eShop	10	4.5	8
21A 21 8613	SNHX 1205 left-hand	eShop	10	5.4	10; 14
21A 21 8623	SNHX 1207 left-hand	eShop	10	7	12; 16
Type		HB7835			
Chamfer width	mm	0.25			

Type		UNI		Insert thickness mm	for slot width a_p mm
21A 21 8575	SNHX 1102 right-hand	eShop	10	2.3	4
21A 21 8585	SNHX 1103 right-hand	eShop	10	2.7	5
21A 21 8595	SNHX 1203 right-hand	eShop	10	3.2	6
21A 21 8605	SNHX 12045 right-hand	eShop	10	4.5	8
21A 21 8615	SNHX 1205 right-hand	eShop	10	5.4	10; 14
21A 21 8625	SNHX 1207 right-hand	eShop	10	7	12; 16
Type		HB7835			
Chamfer width	mm	0.25			



21 8573



21 8575

Garant ISO carbide milling inserts / systems becoming obsolete

Milling inserts for indexable milling cutter No. 211870 - 211872

Type			ST1400	HART	UNI	
21A 21 1892	XDHW 060210	HB7720	eShop	—	—	10
21A 21 1894		HB7705	—	eShop	—	10
21A 21 1898		HB7535	—	—	eShop	10



21 1894



21 1908

Type			ST1400	HART	UNI	
21A 21 1902	XDHW 10T310	HB7720	eShop	—	—	10
21A 21 1904		HB7705	—	eShop	—	10
21A 21 1908		HB7535	—	—	eShop	10

Milling inserts for indexable milling cutter No. 213100



21 3450



21 3510



21 3520

Type			ST1400	INOX	UNI	
21A 21 3450	SPUN 120308 E	HU7730	eShop	—	—	10
21A 21 3510	SPUN 120308 S	HB7535	—	eShop	—	10
21A 21 3520	SPUN 120308 E	HB7720	—	—	eShop	10
21A 21 3530	SPKN 1203 EDER	HU7730	eShop	—	—	10
21A 21 3540	SPKN 1203 EDSR	HB7535	—	eShop	—	10
21A 21 3560	SPKN 1203 EDER	HB7720	—	—	eShop	10
21A 21 3600	SPLR 120308 S	HB7535	—	—	eShop	10

Milling inserts for indexable milling cutter No. 214800

Type			ALU	ST500	
21A 21 4940	MPHX 1104 PPFR	HU7710	eShop	—	10
21A 21 4960	MPHX 1104 PPER	HB7535	—	eShop	10



21 4940



21 4960

Milling inserts for indexable milling cutter No. 216000 - 6008

Type			ALU	ST1400	
21A 21 6012	ANGT 160605 PPFR	HU7710	eShop	—	10
21A 21 6015	ANGT 160605 PPTR	HB7830	—	eShop	10



21 6012



21 6015

Milling inserts for indexable milling cutter No. 216025 - 6032

Type			ALU	ST1400	
21A 21 6035	ANGT 100305 PDFR	HU7710	eShop	—	10
21A 21 6037	ANGT 100305 PDER	HB7830	—	eShop	10



21 6035



21 6037

Milling inserts for precision boring bar No. 217200

Type			UNI	
29W 21 7231	MPHX 060202 TN	HB7720	eShop	10



21 7231

Solid carbide	DIN 6527	Type N	f9				
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HAIMER MILL solid carbide milling cutter / HAIMER MILL solid carbide milling cutter SAFE-LOCK®

For **general-purpose use** in steel materials and high-alloy steels, especially stainless steel. With **cylindrical core** for optimised tool stiffness when milling slots. Reliable processes guaranteed when ramping and during circular interpolation milling thanks to **special end face geometry**.

22 0288/0290/0294 – With SAFE-LOCK pull-out protection to provide an additional form fit for the tool. In conjunction with SAFE-LOCK tool holders, it secures the tool to prevent it being pulled out.

Note: Tool holders with the SAFE-LOCK pull-out protection can be found under clamping technology.

22 0286 – For **HB** use order **No. 220287**.

22 0289 – For **HB** use order **No. 220291**.

22 0292 – For **HB** use order **No. 220293**.



22 0286



22 0288



22 0289



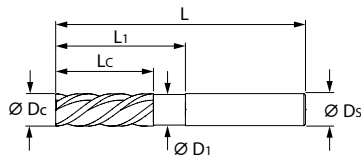
22 0290



22 0292



22 0294



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
22 0286–22 0294	480	480	350	275	255	210	190							95	75	35	155						

Ø f9 D _c	26X 22 0286	26X 22 0288	26X 22 0289	26X 22 0290	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°		
	HAIMER MILL end mill											
	SAFE-LOCK		SAFE-LOCK									
mm	AITiN	AITiN	AITiN	AITiN	mm	mm	mm	mm	mm	mm	mm	mm
2	–	–	–	–	7	9	1.9	58	6	0.04	0.011	0.013
3	–	–	–	–	8	10	2.9	58	6	0.06	0.017	0.02
4	–	–	–	–	11	15	3.8	58	6	0.08	0.022	0.026
5	–	–	–	–	13	18	4.8	58	6	0.1	0.028	0.033
6	–	–	–	–	13	20	5.7	58	6	0.12	0.033	0.039
8	–	–	–	–	19	26	7.6	64	8	0.16	0.044	0.052
10	–	–	–	–	22	30.5	9.5	73	10	0.2	0.055	0.065
12	–	–	–	–	26	36.5	11.4	84	12	0.24	0.066	0.078
16	–	–	–	–	32	42.5	15.2	93	16	0.32	0.088	0.104
20	–	–	–	–	38	52	19	105	20	0.4	0.11	0.13

Ø f9 D _c	26X 22 0292	26X 22 0294	L _c	L ₁	Ø D ₁	L	Ø D _s	Corner chamfer width at 45°		
	HAIMER MILL end mill									
	SAFE-LOCK									
mm	AITiN	AITiN	mm	mm	mm	mm	mm	mm	mm	mm
6	–	–	18	24	5.7	62	6	0.12	0.033	0.039
8	–	–	24	32	7.6	70	8	0.16	0.044	0.052
10	–	–	30	40	9.5	82	10	0.2	0.055	0.065
12	–	–	36	48	11.4	95	12	0.24	0.066	0.078
16	–	–	48	64	15.2	115	16	0.32	0.088	0.104
20	–	–	60	80	19	133	20	0.4	0.11	0.13

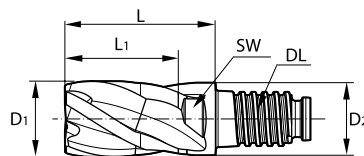


DUO-LOCK® interchangeable head system – milling heads for aluminium machining

Note: DUO-LOCK HAIMEER MILL PowerSeries:
First choice for applications with long overhangs and unstable clamping conditions.
For particularly smooth running on long overhangs it is preferable to use solid carbide extensions.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N						
22 0306/0307	240	240	120																				

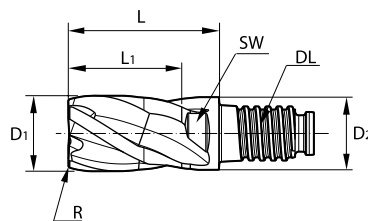
DUO-LOCK® HAIMEER MILL Power Series solid carbide milling head, corner chamfer



22 0306

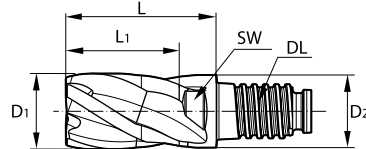
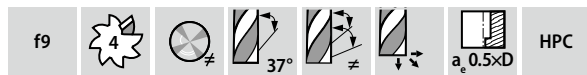
$\varnothing f9 D_1$	26°	22 0306	$\varnothing D_2$	L_1		DUO-LOCK interface	AF	recommended tightening torque			f_z
		DUO-LOCK HAIMEER MILL Power Series									
		HPC									
mm		uncoated	mm	mm	mm		mm	Nm	mm	mm	
10		—	9.6	15	20	DL10	8	20	0.2	0.03	
12		—	11.5	18	24	DL12	9.5	30	0.24	0.03	
16		—	15.5	24	32	DL16	13	60	0.32	0.04	
20		—	19.3	30	40	DL20	16	80	0.4	0.05	

DUO-LOCK® HAIMEER MILL Power Series solid carbide milling head, corner radius



22 0307

$\varnothing f9 D_1/R$	26°	22 0307	$\varnothing D_2$	L_1		DUO-LOCK interface	AF	recommended tightening torque			f_z
		DUO-LOCK HAIMEER MILL Power Series									
		HPC									
mm		uncoated	mm	mm	mm	mm	mm	Nm	mm	mm	
10/1,0		—	9.6	15	20	DL10	8	20	1	0.03	
10/1,5		—	9.6	15	20	DL10	8	20	1.5	0.03	
10/2,0		—	9.6	15	20	DL10	8	20	2	0.03	
12/1,0		—	11.5	18	24	DL12	9.5	30	1	0.03	
12/1,5		—	11.5	18	24	DL12	9.5	30	1.5	0.03	
12/2,0		—	11.5	18	24	DL12	9.5	30	2	0.03	
12/3,0		—	11.5	18	24	DL12	9.5	30	3	0.03	
12/4,0		—	11.5	18	24	DL12	9.5	30	4	0.03	
16/1,0		—	15.5	24	32	DL16	13	60	1	0.04	
16/2,0		—	15.5	24	32	DL16	13	60	2	0.04	
16/3,0		—	15.5	24	32	DL16	13	60	3	0.04	
16/4,0		—	15.5	24	32	DL16	13	60	4	0.04	
20/1,0		—	19.3	30	40	DL20	16	80	1	0.05	
20/2,0		—	19.3	30	40	DL20	16	80	2	0.05	

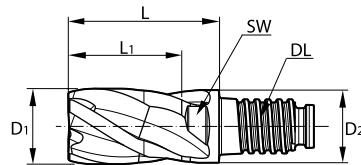
DUO-LOCK® HAIRER MILL Power Series solid carbide milling head, corner chamfer

22 0320

$\varnothing f9 D_1$	26°	22 0320	$\varnothing D_2$	L_1	Overall length L	DUO-LOCK interface	AF	recommended tightening torque	45°	f_z
		DUO-LOCK HAIRER MILL Power Series								
		HPC								
mm		AITiN	mm	mm	mm		mm	Nm	mm	mm
10		—	9.6	15	20	DL10	8	20	0.2	0.015
12		—	11.5	18	24	DL12	9.5	30	0.24	0.015
16		—	15.5	24	32	DL16	13	60	0.32	0.03
20		—	19.3	30	40	DL20	16	80	0.4	0.03

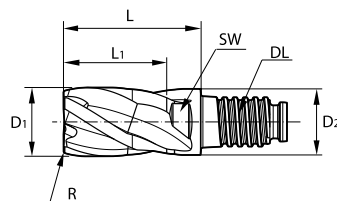
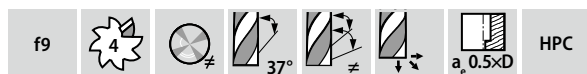
DUO-LOCK® HAIRER MILL solid carbide milling head, corner chamfer

22 0322



22 0323

Ø f9 D ₁	26°	22 0322	26°	22 0323	Z	Ø D ₂	L ₁	Overall length L		DUO-LOCK in- terface	AF	recommended tightening torque	 45°	 f _z < 900 N
	DUO-LOCK HAIRER MILL													
	HPC													
	22 0322	22 0323	22 0322	22 0323										
mm	AITiN	AITiN			mm	mm	mm	mm	mm	mm	Nm	mm	mm	
10	—	—	6	9.6	7.5	15	12,5	20	DL10	8	20	0.2	0.06	
12	—	—	6	11.5	9	18	15	24	DL12	9.5	30	0.24	0.065	
16	—	—	8	15.5	12	24	20	32	DL16	13	60	0.32	0.08	
20	—	—	10	19.3	15	30	25	40	DL20	16	80	0.4	0.09	

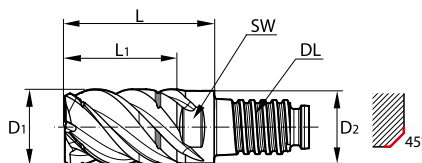
DUO-LOCK® HAIRER MILL Power Series solid carbide milling head, corner radius

22 0334

$\varnothing f9 D_1/R$	26°	22 0334	$\varnothing D_2$	L_1	Overall length L	DUO-LOCK interface	AF	recommended tightening torque	R	f_z
		DUO-LOCK HAIRER MILL Power Series								
		HPC								
mm		AITiN	mm	mm	mm		mm	Nm	mm	mm
10/1,0		—	9.6	15	20	DL10	8	20	1	0.03
10/1,5		—	9.6	15	20	DL10	8	20	1.5	0.03
10/2,0		—	9.6	15	20	DL10	8	20	2	0.03
12/1,0		—	11.5	18	24	DL12	9.5	30	1	0.03
12/1,5		—	11.5	18	24	DL12	9.5	30	1.5	0.03
12/2,0		—	11.5	18	24	DL12	9.5	30	2	0.03
12/3,0		—	11.5	18	24	DL12	9.5	30	3	0.03
12/4,0		—	11.5	18	24	DL12	9.5	30	4	0.03
16/1,0		—	15.5	24	32	DL16	13	60	1	0.04
16/2,0		—	15.5	24	32	DL16	13	60	2	0.04
16/3,0		—	15.5	24	32	DL16	13	60	3	0.04
16/4,0		—	15.5	24	32	DL16	13	60	4	0.04
20/1,0		—	19.3	30	40	DL20	16	80	1	0.05
20/2,0		—	19.3	30	40	DL20	16	80	2	0.05

DUO-LOCK® HAIMER MILL Power Series solid carbide milling head, corner chamfer

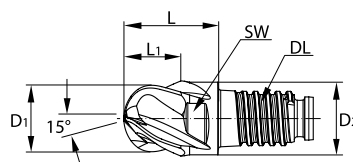
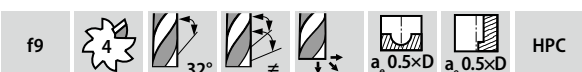
Note: h_{max} : The values stated in the table are maximum values.
 $a_{e_{max}} = 0.05 \times D$ for TPC machining.



22 0326

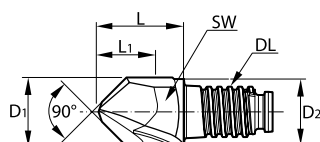
22 0327

$\varnothing h9 D_1$	26Y	22 0326	26Y	22 0327	$\varnothing D_2$	L_1	Overall length L	DUO-LOCK interface	AF	recommended tightening torque	h_{max}	TPC
DUO-LOCK HAIMER MILL Power Series												
		TPC										
mm		AITiN		AITiN	mm	mm	mm	mm	mm	Nm	mm	mm
10		—		—	9.6	15	—	20	—	20	0.3	0.026
12		—		—	11.5	18	—	24	—	30	0.3	0.028
16		—		—	15.5	24	48	32	56	60	0.5	0.035
20		—		—	19.3	30	60	40	70	80	0.6	0.039

DUO-LOCK® HAIMER MILL solid carbide milling head, full radius

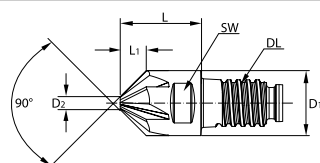
22 0348

$\varnothing f9 D_1$	26Y	22 0348	$\varnothing D_2$	L_1	Overall length L	DUO-LOCK interface	AF	recommended tightening torque	f_z	f_z
DUO-LOCK HAIMER MILL										
		HPC								
mm		AITiN	mm	mm	mm		mm	Nm	mm	mm
10		—	9.6	7.5	12.5	DL10	8	20	0.03	0.066
12		—	11.5	9	15	DL12	9.5	30	0.03	0.065
16		—	15.5	12	20	DL16	13	60	0.04	0.08
20		—	19.3	15	25	DL20	16	80	0.05	0.09

DUO-LOCK® HAIMER MILL solid carbide milling head, multi-functional

22 0353

$\varnothing f9 D_1$	26Y	22 0353	$\varnothing D_2$	L_1	Overall length L	DUO-LOCK interface	recommended tightening torque	AF	f_z
DUO-LOCK HAIMER MILL									
		90° HPC							
mm			mm	mm	mm		mm	Nm	mm
10		—	9.6	10	12.5	DL10	20	8	0.06
12		—	11.5	12	15	DL12	30	9.5	0.065
16		—	15.5	16	20	DL16	60	13	0.08
20		—	19.3	20	25	DL20	80	16	0.09

DUO-LOCK® HAIMER MILL solid carbide milling head, deburrer

22 0359

$\varnothing h6 D_1$	26Y	22 0359	$\varnothing D_2$	L_1	Overall length L	DUO-LOCK interface	recommended tightening torque	AF	f_z
DUO-LOCK HAIMER MILL									
		90° HPC							
mm			mm	mm	mm		mm	Nm	mm
10		—	2	4	12.5	DL10	20	8	0.06
12		—	2.4	4.8	15	DL12	30	9.5	0.065
16		—	3.2	6.4	20	DL16	60	13	0.08
20		—	4	8	25	DL20	80	16	0.09

DUO-LOCK® interchangeable head system – arbors

DUO-LOCK® extension, cylindrical, steel



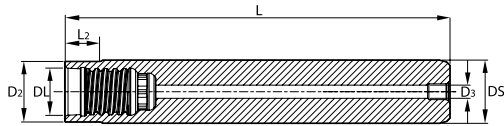
Coated for optimum shrinking in and out.



22 0370



22 0372



22 0374

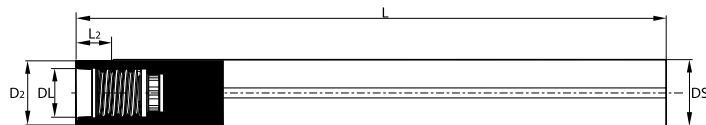
DUO-LOCK interface	26Y	22 0370	26Y	22 0372	26Y	22 0374	Ø D _s	Ø D ₂	L			L ₂	Recommended torque
	DUO-LOCK extension, cylindrical, steel, short			DUO-LOCK extension, cylindrical, steel, long									
	SAFE-LOCK	Plain shank	Plain shank										
					mm	mm	mm	mm	mm	mm	Nm		
DL10	—	—	—	—	10	9.6	55	—	100	5	20		
DL12	—	—	—	—	12	11.5	65	60	120	6	30		
DL16	—	—	—	—	16	15.5	70	65	160	8	60		
DL20	—	—	—	—	20	19.3	80	70	200	10	80		

DUO-LOCK® extension, solid carbide



Technically optimised.

Note: Special dimensions available on request.



22 0377

DUO-LOCK interface	10N 22 0377	$\varnothing D_1$	$\varnothing D_2$	L	L_2	Recommended torque
	DUO-LOCK extension, cylindrical, solid carbide					
	Plain shank					
DL10	—	mm	mm	mm	mm	Nm
DL12	—	10	9.6	77.5	37.5	20
DL16	—	12	11.5	93	45	30
DL20	—	16	15.5	108	60	60
		20	19.3	125	75	80

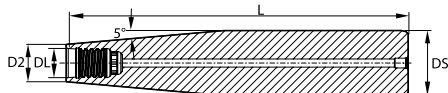
DUO-LOCK® extension, conical, steel



Coated for optimum shrinking in and out.

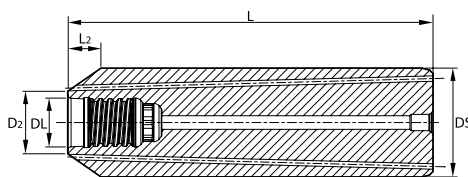


22 0376



22 0378

DUO-LOCK interface / Ø D _s	26Y	22 0376	26Y	22 0378	Ø D _s	Ø D ₂	L		Recommended torque
	DUO-LOCK extension, conical, steel, short								
	DUO-LOCK extension, conical, steel, long								
	SAFE-LOCK								
		Plain shank			mm	mm	22 0376 mm	22 0378 mm	Nm
DL10/12	—	—			12	9.6	65	120	20
DL10/16	—	—			16	9.6	90	160	20
DL10/20	—	—			20	9.6	115	200	20
DL12/16	—	—			16	11.5	80	160	30
DL12/20	—	—			20	11.5	105	200	30
DL16/20	—	—			20	15.5	80	200	60
DL16/25	—	—			25	15.5	115	250	60
DL20/25	—	—			25	19.3	95	250	80

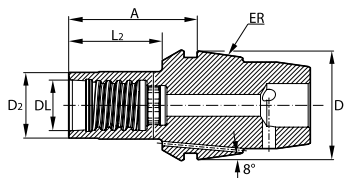
DUO-LOCK® extension, Heavy Duty with Cool Jet, steel

22 0380

DUO-LOCK interface	26Y	22 0380	$\varnothing D_1$	$\varnothing D_2$	L	L ₂	Recommended torque
		DUO LOCK extension Heavy Duty with Cool Jet steel					
		SAFE-LOCK	mm	mm	mm	mm	Nm
DL10		—	16	9.6	62.5	6	20
DL12		—	20	11.5	67	6	30
DL16		—	25	15.5	78	6	60
DL20		—	32	19.3	82	6	80

DUO-LOCK® ER colletsISO
15488-A

Note: HAIMER ER collets are incompatible with Centro P and HiRunER collet chucks.



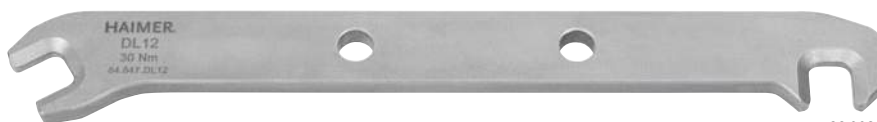
22 0386

DUO-LOCK interface	26Y	22 0386	26Y	22 0387	L ₂		A		$\varnothing D_2$	Recommended torque
		DUO-LOCK ER collet			22 0386	22 0387	22 0386	22 0387	mm	Nm
		ER 16		ER 20	mm	mm	mm	mm	mm	
DL10		—		—	5.3	5.48	12	13	9.6	20
DL12		—		—	—	6.48	—	14	11.5	30

DUO-LOCK interface	26Y	22 0388	26Y	22 0389	L ₂		A		$\varnothing D_2$	Recommended torque
		DUO-LOCK ER collet			22 0388	22 0389	22 0388	22 0389	mm	Nm
		ER 25		ER 32	mm	mm	mm	mm	mm	
DL10		—		—	5.5	5	13.5	14	9.6	20
DL12		—		—	6.5	6	14.5	15	11.5	30
DL16		—		—	5.5	8	13.5	17	15.5	60
DL20		—		—	—	10	—	19	19.3	80

DUO-LOCK® accessories**Note:**

22 9932 – Plug-in shank 9×12 mm. Suitable torque wrench can be ordered under No. 657094 size 100.



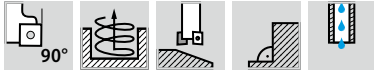
22 9930

Width across flats AF	mm	8	9,5	13	16
26Y 22 9930	DUO-LOCK hand wrench	—	—	—	—
L	mm	196	199	217	236
DUO-LOCK interface		DL10	DL12	DL16	DL20



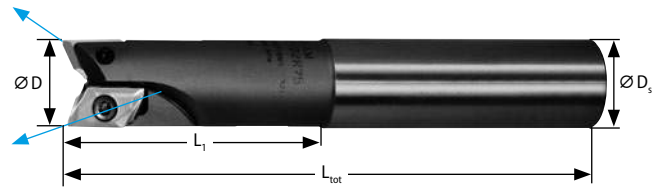
22 9932

Width across flats AF	mm	8	9,5	13	16
26Y 22 9932	DUO-LOCK plug-in adaptor for torque wrench	—	—	—	—
Recommended torque	Nm	20	30	60	80
DUO-LOCK interface		DL10	DL12	DL16	DL20
Pitch S	mm	16.6	16.9	16.8	17
Socket for plug-in head	mm	9×12			



KENAMETAL Shoulder mill 90° 5720VZ16 for indexable inserts ZDET 16M5

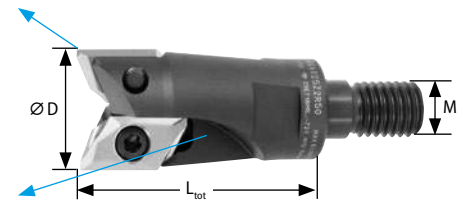
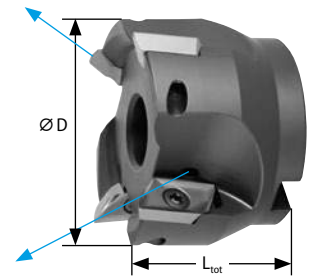
Milling body with plain shank, balanced to $G = 6.3$ at 30,000 rpm. Shell-type milling cutters and milling cutters with modular interfaces have to be balanced together with their holder before use in high-speed copy milling. The design allows all radii of indexable inserts up to $r_e = 6.0$ mm to be mounted without modification to the milling head and without length correction.



Ø D / number of teeth Z	28R	22 0800	maximum cutting depth a_p max	L_1	L_{tot}	Ø D _s h6	Insert screw
		Shoulder mill 90° 5720VZ16 Plain shank	mm	mm	mm	mm	
25/2		eShop	16	75	131	25	229900 (TP20; 6.0 Nm)
32/2		eShop	16	75	135	32	229900 (TP20; 6.0 Nm)
32/3		eShop	16	75	135	32	229900 (TP20; 6.0 Nm)

Ø D / number of teeth Z	28R	22 0803	maximum cutting depth a_p max	L_{tot}	Mounting bore Ø	Insert screw
		Shoulder mill 90° 5720VZ16 with bore	mm	mm	mm	
40/3		eShop	16	45	16	229900 (TP20; 6.0 Nm)
42/3		eShop	16	45	16	229900 (TP20; 6.0 Nm)
50/3		eShop	16	45	22	229900 (TP20; 6.0 Nm)
50/4		eShop	16	45	22	229900 (TP20; 6.0 Nm)
52/4		eShop	16	45	22	229900 (TP20; 6.0 Nm)
63/4		eShop	16	45	22	229900 (TP20; 6.0 Nm)
63/5		eShop	16	45	22	229900 (TP20; 6.0 Nm)
80/4		eShop	16	50	27	229900 (TP20; 6.0 Nm)
80/5		eShop	16	50	27	229900 (TP20; 6.0 Nm)

Ø D / number of teeth Z	28R	22 0806	maximum cutting depth a_p max	L_{tot}	Mounting thread M	Insert screw
		Shoulder mill 90° 5720VZ16 with threaded shank	mm	mm		
25/2		eShop	16	50	M12	229900 (TP20; 6.0 Nm)
32/2		eShop	16	50	M16	229900 (TP20; 6.0 Nm)
32/3		eShop	16	50	M16	229900 (TP20; 6.0 Nm)



KENAMETAL Indexable inserts ZDET 16.. for shoulder mill No. 220800 – 220806

Recommendation: When exchanging the indexable inserts, please also replace the screws. Spare screws are supplied with the indexable inserts.

Note: f_z for $a_e = 0.3 \times D$.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	Graphite GRP CRP	Uni				
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N					
22 0810–22 0832	1640	1370	1095																●	○	○	○

Type		ALU	
28E 22 0810	ZDET 16M503 PDFR-721	GH1	eShop
28E 22 0812	ZDET 16M504 FR-721	GH1	eShop
28E 22 0814	ZDET 16M508 FR-721	GH1	eShop
28E 22 0816	ZDET 16M512 FR-721	GH1	eShop
28E 22 0818	ZDET 16M516 FR-721	GH1	eShop
28E 22 0820	ZDET 16M520 FR-721	GH1	eShop
28E 22 0822	ZDET 16M525 FR-721	GH1	eShop
28E 22 0824	ZDET 16M530 FR-721	GH1	eShop
28E 22 0826	ZDET 16M532 FR-721	GH1	eShop
28E 22 0828	ZDET 16M540 FR-721	GH1	eShop
28E 22 0830	ZDET 16M550 FR-721	GH1	eShop
28E 22 0832	ZDET 16M560 FR-721	GH1	eShop
f_z for roughing up to $a_{p,max}$ 16 mm	mm		0.12 – 0.25
f_z for pre-finishing $a_p = 3$ mm	mm		0.05 – 0.15
f_z for finishing $a_p = 1$ mm	mm		0.02 – 0.1





LOGIQ4FEED high feed rate milling cutter for inserts XNMU040310..

Innovative high feed milling system for efficient roughing – especially for machining deep cavities, e.g. in tool and mould making, as well as in the aerospace industry.

The twisted shape indexable insert has an auxiliary cutting edge which guarantees a higher metal removal rate during oblique plunging.

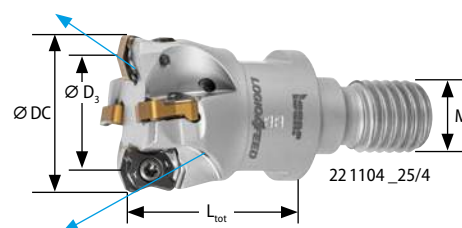
Spare part: Pack of insert screws No. **229695 2** (TX7; 0.9 Nm).



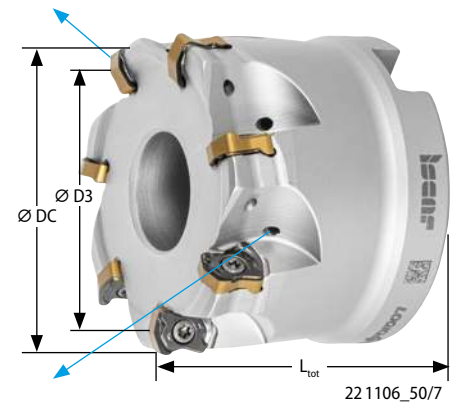
Ø D _c / number of effective cutting edges Z	19D	22 1100	Ø D ₃	L ₁	L _{tot}	Ø D ₅ h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		LOGIQ4FEED high feed rate indexable milling cutter Plain shank	mm	mm	mm	mm	mm	mm	mm	degrees	mm
16/2		—	8.6	30	120	16	24.6	31	0.8	4.3	6.6
20/3		—	12.6	50	140	20	32.6	39	0.8	2.7	10.6
25/4		—	17.6	60	150	25	42.6	49	0.8	1.8	15.6
32/5		—	24.6	120	205	32	56.6	63	0.8	1.2	22.6



Ø D _c / number of effective cutting edges Z	19D	22 1101	Ø D ₃	L ₁	L _{tot}	Ø D ₅ h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		LOGIQ4FEED high feed rate indexable milling cutter Weldon shank	mm	mm	mm	mm	mm	mm	mm	degrees	mm
16/2		—	8.6	50	110	20	24.6	31	0.8	4.3	6.6
20/3		—	12.6	60	120	20	32.6	39	0.8	2.7	10.6
25/4		—	17.6	80	140	25	42.6	49	0.8	1.8	15.6
32/5		—	24.6	80	150	32	56.6	63	0.8	1.2	22.6



Ø D _c / number of effective cutting edges Z	19D	22 1104	Ø D ₃	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		LOGIQ4FEED high feed rate indexable milling cutter with threaded shank	mm	mm		mm	mm	mm	degrees	mm
20/3		—	12.6	25	M10	32.6	39	0.8	2.7	10.6
25/4		—	17.6	30	M12	42.6	49	0.8	1.8	15.6
32/5		—	24.6	35	M16	56.6	63	0.8	1.2	22.6
35/5		—	27.6	35	M16	62.6	69	0.8	1.1	25.6
42/6		—	34.6	40	M16	76.6	83	0.8	0.8	32.6



Ø D _c / number of cutting edges Z	19D	22 1106 LOGIQ4FEED high feed rate indexable milling cutter with bore	Ø D ₃	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
			mm	mm	mm	mm	mm	mm	degrees	mm
32/5		—	24.6	40	16	56.6	63	0.8	1.2	22.6
40/6		—	32.6	40	16	72.6	79	0.8	0.9	30.6
42/6		—	34.6	40	16	76.6	83	0.8	0.8	32.6
50/7		—	42.6	40	22	92.6	99	0.8	0.7	40.6
52/7		—	44.6	40	22	96.6	103	0.8	0.7	42.6

LOGIQ4FEED milling inserts XNMU040310.. for high feed rate milling cutter

Double-sided indexable insert with 4 cutting edges. With auxiliary cutting edge.

Note: Standard application values for $a_e = 0.6$ to $1 \times D / a_{p \max} = 0.8$ mm.
The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Inconel ¹	GG(G)					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	S	K					
22 1201														110	90	30	25			●			
22 1202														130	100	30	25			●			
22 1204																30				●			
22 1205/1207														100	80	25	30			●			
22 1208																		200		●			
22 1209/1210				220	200	190	180							90	80					●		○	●
22 1211				200	180	170	160	140												●		○	●
22 1213														140	110	30	30			●			
22 1214														140	120	35	35			○		●	●



22 1211



22 1202



22 1204

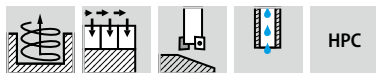


22 1208



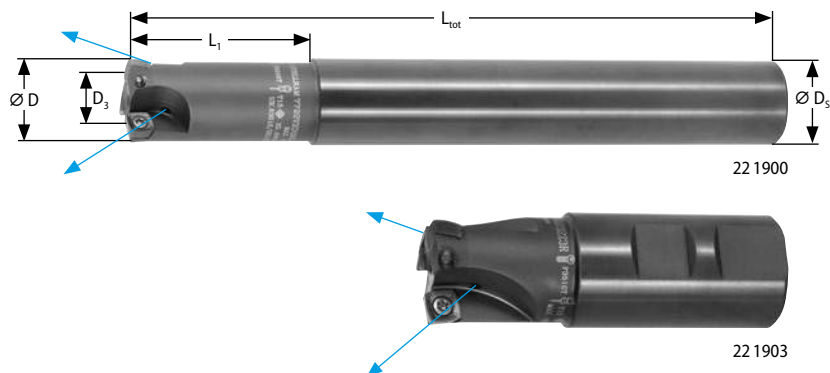
22 1209

Type			ST1400	INOX	S	GGG	UNI		a _{p max} mm
19A 22 1211	XNMU 040310T	IC830	—	—	—	—	—	10	0.8
19A 22 1201	XNMU 040310HP	IC830	—	—	—	—	—	10	0.8
19A 22 1202	XNMU 040310HP	IC840	—	—	—	—	—	10	0.8
19A 22 1213	XNMU 040310RM-HP	IC808	—	—	—	—	—	10	0.8
19A 22 1204	XNMU 040310HP	IC716	—	—	—	—	—	10	0.8
19A 22 1205	XNMU 040310HP	IC882	—	—	—	—	—	10	0.8
19A 22 1214	XNMU 040310HP	IC5820	—	—	—	—	—	10	0.8
19A 22 1207	XNMU 040310RM-HP	IC882	—	—	—	—	—	10	0.8
19A 22 1208	XNMU 040310T	IC810	—	—	—	—	—	10	0.8
19A 22 1209	XNMU 040310T	IC808	—	—	—	—	—	10	0.8
19A 22 1210	XNMU 040310RM-T	IC808	—	—	—	—	—	10	0.8
Programming radius at a _{p max}			mm	1.8					
f _z			mm	0.8	0.8	0.4	0.8	—	

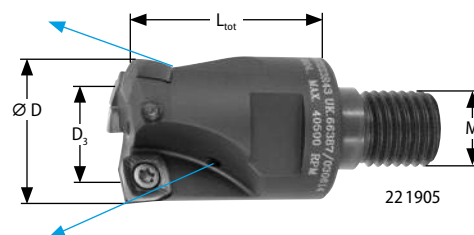


KENAMETAL High feed rate milling cutter 7792VX for extreme metal removal rates

Description: The unique design of the indexable inserts together with their approach angle in the milling body greatly reduces the radial forces and diverts them into the axial direction. Particularly thick indexable inserts with 4 cutting edges for the heaviest duties and high cost-effectiveness. The tool has particular advantages for face milling and milling deep pockets. With its ground wiper chamfer it is equally well suited also to plunge milling and finish milling operations.

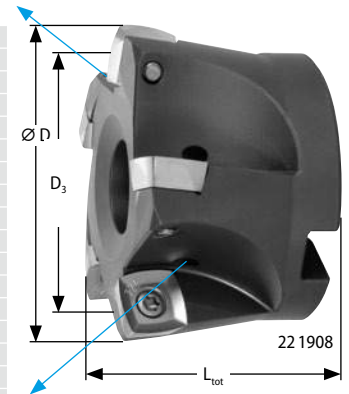


Ø D / number of teeth Z	22 1900		22 1903		Number of cutting ed- ges Z	Ø D ₃	maximum cutting depth a _{p max}	L ₁		L _{tot}		Ø D ₃ h6	Indexable insert size	Insert screw
	High feed rate milling cutter							22 1900	22 1903	22 1900	22 1903			
	7792VX													
mm	Plain shank	Weldon shank		mm	mm	mm	mm	mm	mm	mm				
16/2	eShop	—	2	5	0.9	25	—	188	—	16	06	229915 (T7; 0.8 Nm)		
20/3	eShop	—	3	9	0.9	32	—	204	—	20	06	229915 (T7; 0.8 Nm)		
25/2	eShop	eShop	2	10	1.5	50	40	200	96	25	09	229917 (T15; 2.1 Nm)		
25/3	eShop	—	3	10	1.5	50	—	200	—	25	09	229917 (T15; 2.1 Nm)		
25/4	eShop	—	4	14	0.9	40	—	210	—	25	06	229916 (T7; 0.8 Nm)		
32/2	eShop	—	2	11	2.5	70	—	250	—	32	12	229908 (T15; 3.1 Nm)		
32/3	eShop	eShop	3	17	1.5	70	40	250	100	32	09	229918 (T15; 2.1 Nm)		
32/3L	eShop	—	3	11	2.5	70	—	250	—	32	12	229908 (T15; 3.1 Nm)		
32/4	eShop	—	4	17	1.5	70	—	250	—	32	09	229918 (T15; 2.1 Nm)		
32/5	eShop	—	5	21	0.9	40	—	250	—	32	06	229916 (T7; 0.8 Nm)		
40/2	eShop	—	2	13	3.5	102	—	172	—	40	16	229920 (TP20; 7.6 Nm)		



Ø D / number of teeth Z	288	22 1905	Number of cutting edges Z	Ø D ₃	maximum cutting depth a _{p max}	L _{tot}	Mounting thread M	Indexable insert size	Insert screw
	High feed rate milling cutter								
	7792VX with threaded shank								
mm				mm	mm	mm			
16/2		eShop	2	5	0.9	25	M8	06	229915 (T7; 0.8 Nm)
20/2		eShop	2	9	0.9	35	M10	06	229915 (T7; 0.8 Nm)
20/3		eShop	3	9	0.9	35	M10	06	229915 (T7; 0.8 Nm)
25/2		eShop	2	10	1.5	35	M12	09	229917 (T15; 2.1 Nm)
25/3		(eShop)	3	10	0.9	35	M12	06	229916 (T7; 0.8 Nm)
25/3L		eShop	3	10	1.5	35	M12	09	229917 (T15; 2.1 Nm)
25/4		eShop	4	14	0.9	35	M12	06	229916 (T7; 0.8 Nm)
32/2		eShop	2	11	2.5	43	M16	12	229908 (T15; 3.1 Nm)
32/3		eShop	3	17	1.5	43	M16	09	229918 (T15; 2.1 Nm)
32/3L		eShop	3	11	2.5	43	M16	12	229908 (T15; 3.1 Nm)
32/4		eShop	4	17	1.5	43	M16	09	229918 (T15; 2.1 Nm)
32/5		eShop	5	21	0.9	43	M16	06	229916 (T7; 0.8 Nm)
35/3		eShop	3	20	1.5	43	M16	09	229918 (T15; 2.1 Nm)
35/3L		eShop	3	14	2.5	43	M16	12	229908 (T15; 3.1 Nm)
35/4		eShop	4	20	1.5	43	M16	09	229918 (T15; 2.1 Nm)
35/6		eShop	6	24	0.9	43	M16	06	229916 (T7; 0.8 Nm)
42/4		eShop	4	21	2.5	43	M16	12	229908 (T15; 3.1 Nm)
42/5		eShop	5	27	1.5	43	M16	09	229918 (T15; 2.1 Nm)

Ø D / number of teeth Z	28R	22 1908	Ø D ₃	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø	Indexable insert size	Insert screw
		High feed rate milling cutter						
		7792VX with bore						
mm			mm	mm	mm	mm		
40/3		eShop	25	1.5	32	16	09	229918 (T15; 2.1Nm)
40/4		eShop	25	1.5	32	16	09	229918 (T15; 2.1Nm)
40/4L		eShop	19	2.5	40	22	12	229919 (T15; 3.1 Nm)
40/5		(eShop)	25	1.5	32	16	09	229918 (T15; 2.1Nm)
42/4		eShop	21	1.5	32	16	09	229918 (T15; 2.1Nm)
42/5		eShop	27	1.5	32	16	09	229918 (T15; 2.1Nm)
50/4		eShop	29	2.5	40	22	12	229919 (T15; 3.1Nm)
50/5		eShop	35	1.5	40	22	09	229918 (T15; 2.1Nm)
50/6		eShop	35	1.5	40	22	09	229918 (T15; 2.1Nm)
50/6L		(eShop)	29	2.5	40	22	12	229919 (T15; 3.1 Nm)
52/3		eShop	31	2.5	40	22	12	229919 (T15; 3.1Nm)
52/4		eShop	31	2.5	40	22	12	229919 (T15; 3.1Nm)
52/5		eShop	31	2.5	40	22	12	229919 (T15; 3.1Nm)
63/4		eShop	42	2.5	40	22	12	229919 (T15; 3.1Nm)
63/5		eShop	42	2.5	40	22	12	229919 (T15; 3.1Nm)
63/5L		eShop	36	3.5	40	22	16	229920 (TP20; 7.6Nm)
63/7		eShop	42	2.5	40	22	12	229919 (T15; 3.1 Nm)
66/4		eShop	45	2.5	45	27	12	229919 (T15; 3.1Nm)
66/5		eShop	45	2.5	45	27	12	229919 (T15; 3.1Nm)
66/5L		(eShop)	51	1.5	50	27	09	229918 (T15; 2.1Nm)
80/5		eShop	59	2.5	50	27	12	229919 (T15; 3.1Nm)
80/6		(eShop)	53	3.5	50	27	16	229920 (TP20; 7.6Nm)
80/8		eShop	59	2.5	50	27	12	229919 (T15; 3.1Nm)
100/6		(eShop)	79	2.5	50	32	12	229919 (T15; 3.1Nm)
100/8		(eShop)	73	3.5	50	32	16	229920 (TP20; 7.6Nm)
100/9		(eShop)	79	2.5	50	32	12	229919 (T15; 3.1Nm)
125/8		(eShop)	104	2.5	63	40	12	229919 (T15; 3.1Nm)
125/10		(eShop)	98	3.5	63	40	16	229920 (TP20; 7.6Nm)
125/11		(eShop)	104	2.5	63	40	12	229919 (T15; 3.1Nm)
160/12		(eShop)	133	3.5	63	50	16	229920 (TP20; 7.6Nm)



KENNAMETAL Indexable inserts for high feed rate milling cutters No. 221900 – 221908

Particularly thick indexable inserts with ground wiper chamfer.

Note: Standard application values for a_e = 0.3×D.

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K							
GH2		800	600																		●	○		○
KCMP30				340	260	210	180	155													○	○	●	●
X500					230	180	140							200	170	60		●			●	○	●	●
X400				260	240	200	150	110														●	●	●
SP6519				280	250	185	150	130						210	160	50	220	●			○	○	●	●

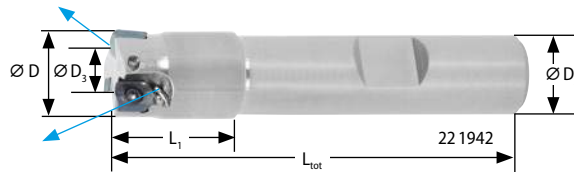
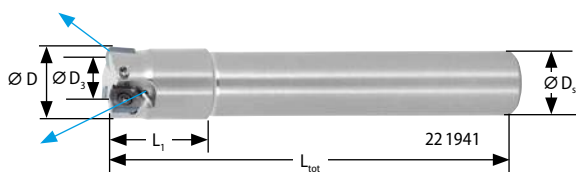


Indexable insert size			mm	06	09	12	16		f _z mm
28E	22 1920	X.LT...ER-D721	GH2	eShop	eShop	eShop	—	10	0.2 – 1.5
28F	22 1923	XDLW...SR-D	X500	—	eShop	eShop	—	10	0.3 – 2.5
28F	22 1925	X.LT...ER-D41	X400	eShop	eShop	eShop	eShop	10	0.2 – 1.8
28E	22 1921	X.LW...SR-D	KCMP30	—	eShop	—	—	10	0.2 – 3
28E	22 1922	X.LT...ER-D41	KCMP30	eShop	eShop	eShop	eShop	10	0.2 – 2.5
28E	22 1924	XDPT...ER-D41	KCMP30	—	eShop	eShop	—	10	0.2 – 2.5
28E	22 1928	X.LT...ER-D411	SP6519	eShop	eShop	eShop	—	10	0.2 – 2.5
28F	22 1930		X500	—	eShop	eShop	—	10	0.3 – 1.4
28E	22 1935	X.LT...ER-D41	SP6519	eShop	eShop	eShop	eShop	10	0.3 – 2.5
28E	22 1936	XDPT...ER-D41	SP6519	—	eShop	eShop	—	10	0.3 – 2.5
28F	22 1938	X.LT...ER-D41	X500	eShop	eShop	eShop	eShop	10	0.15 – 1
28F	22 1939	XDPT...ER-D41	X500	—	eShop	eShop	—	10	0.15 – 1
Type (22 1920)				ALU	ALU	ALU	—		
Type (22 1923)				—	ST900	ST900	—		
Type (22 1925, 22 1921, 22 1922, 22 1924)				ST1400					
Type (22 1928, 22 1930)				INOX; Ti	INOX; Ti	INOX; Ti	—		
Type (22 1935, 22 1936, 22 1938, 22 1939)				UNI					
Programming radius at a _{p max} (22 1920, 22 1923, 22 1925, 22 1921, 22 1922, 22 1924, 22 1935, 22 1936, 22 1938, 22 1939)				mm	1.37	2.01	2.5	4.18	
Programming radius at a _{p max} (22 1928, 22 1930)				mm	1.37	2.27	2.73	—	

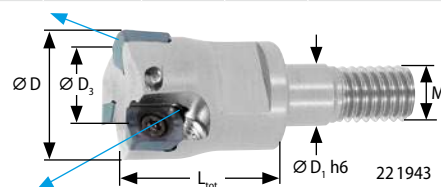


KYOCERA High feed rate indexable milling cutter MFH micro for indexable inserts LPGT 0102..

For extremely cost-effective machining due to high feed rates. Vibration is minimised by cutting force reduction.



Ø D / number of effective cutting edges Z	250 22 1941	250 22 1942	Number of cutting edges Z	Ø D3	maximum cutting depth $a_{p \max}$	L1	Ltot	Ø D5 h6	Circular interpolation milling Ø Dmin	Circular interpolation milling Ø Dmax	Ramping angle $\alpha_{\max}$	Ramping length L for $\alpha_{\max}$	Insert screw
mm	High feed rate milling cutter MFH micro			mm	mm	mm	mm	mm	mm	mm	degrees	mm	
	Plain shank	Weldon shank					22 1941 22 1942						
8/1	eShop	eShop	1	4	0.5	16	75	58	10	12	3.69	3.1	229722 (6IP; 0.6Nm)
10/2	eShop	eShop	2	6	0.5	20	80	60	10	16	2.25	5.1	229722 (6IP; 0.6Nm)
12/3	eShop	eShop	3	8	0.5	20	80	65	12	20	1.61	7.1	229722 (6IP; 0.6Nm)
14/3	eShop	eShop	3	10	0.5	20	80	65	12	24	1.26	9.1	229722 (6IP; 0.6Nm)
16/4	eShop	eShop	4	12	0.5	25	90	73	16	28	1.03	11.1	229722 (6IP; 0.6Nm)



Ø D / number of effective cutting edges Z	250 22 1943	Number of cutting edges Z	Ø D1 h6	Ø D3	maximum cutting depth $a_{p \max}$	Ltot	Mounting thread M	Circular interpolation milling Ø Dmin	Circular interpolation milling Ø Dmax	Ramping angle $\alpha_{\max}$	Ramping length L for $\alpha_{\max}$	Insert screw
mm	High feed rate milling cutter MFH micro with threaded shank		mm	mm	mm	mm		mm	mm	degrees	mm	
8/1	eShop	1	6.5	4	0.5	17	M6	12	14	3.69	3.1	229722 (6IP; 0.6Nm)
10/2	eShop	2	6.5	6	0.5	17	M6	16	18	2.25	5.1	229722 (6IP; 0.6Nm)
12/3	eShop	3	6.5	8	0.5	17	M6	20	22	1.61	7.1	229722 (6IP; 0.6Nm)
14/3	eShop	3	6.5	10	0.5	17	M6	24	26	1.26	9.1	229722 (6IP; 0.6Nm)
16/4	eShop	4	8.5	12	0.5	22	M8	28	30	1.03	11.1	229722 (6IP; 0.6Nm)

KYOCERA Milling inserts LPGT0102.. for high feed rate indexable milling cutter MFH micro

2-edge indexable insert.

Note: Standard application values for $a_e = 0.3 \times D / a_p = 0.3 \text{ mm}$.

Suitable for/ v _c [m/min]	 Alu plastics	 Alu cast	 Alu cast > 10% Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Inconel [®]	GG(G)						
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	S	K						
22 1945				200	180	160	140	100											180					
22 1948														160	120	60								
22 1949														240		30								

Type			ST1400	INOX	S		f _z mm
25A 22 1945	LPGT 010210 ER-GM	PR1825	eShop	—	—	1	0.4
25A 22 1948		PR1835	—	eShop	—	1	0.3
25A 22 1949		CA6535	—	—	eShop	1	0.25
Programming radius at a _{max}			mm		1.2		

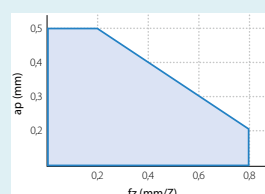


22 1945

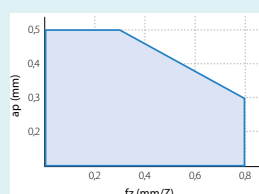
22 1948

22 1949

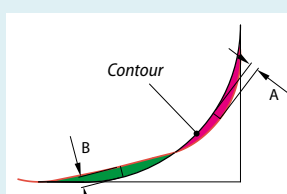
Application notes for the MFH micro



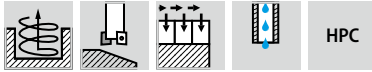
Ø 8 to 12 mm



Ø 14 to 16 mm

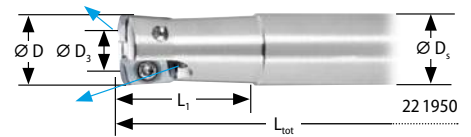


Programmed radius mm	Maximum machined contour mm (A)	Maximum unmachined contour mm (B)
1.0	0	0.21
1.2	0	0.17
1.5	0.08	0.1
2.0	0.28	0.01

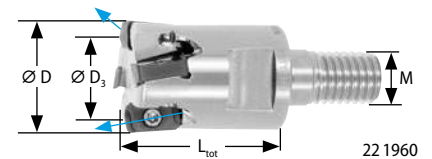


KYOCERA High feed rate indexable milling cutter MFH mini for inserts LOGU 0303..

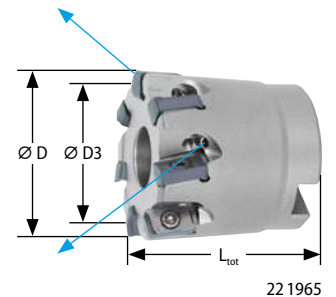
Ø D / number of teeth Z	250 22 1950	250 22 1955	Ø D ₃	maximum cutting depth a _{p max}	L ₁	L _{tot}	Ø D ₃ h6	Insert screw
	High feed rate milling cutter							
	MFH mini					22 1950 22 1955		
mm	Plain shank	Weldon shank	mm	mm	mm	mm	mm	
16/2	eShop	eShop	9	1	30	100	16	229713 (8IP; 1.2 Nm)
16/2L	eShop	—	9	1	50	150	—	229713 (8IP; 1.2 Nm)
20/3	eShop	eShop	13	1	50	130	20	229713 (8IP; 1.2 Nm)
20/3L	eShop	—	13	1	80	160	—	229713 (8IP; 1.2 Nm)
20/4	eShop	eShop	13	1	50	130	20	229713 (8IP; 1.2 Nm)
25/4	eShop	eShop	18	1	60	140	25	229713 (8IP; 1.2 Nm)
25/4L	eShop	—	18	1	100	180	—	229713 (8IP; 1.2 Nm)
25/5	eShop	eShop	18	1	60	140	25	229713 (8IP; 1.2 Nm)
32/5	eShop	eShop	25	1	70	150	32	229713 (8IP; 1.2 Nm)
32/5L	eShop	—	25	1	120	200	—	229713 (8IP; 1.2 Nm)



Ø D / number of teeth Z	250 22 1960	Ø D ₃	maximum cutting depth a _{p max}	L _{tot}	Mounting thread M	Insert screw
	High feed rate milling cutter					
	MFH mini with threaded shank					
mm		mm	mm	mm		
16/2	eShop	9	1	25	M8	229713 (8IP; 1.2 Nm)
20/3	eShop	13	1	30	M10	229713 (8IP; 1.2 Nm)
20/4	eShop	13	1	30	M10	229713 (8IP; 1.2 Nm)
25/4	eShop	18	1	35	M12	229713 (8IP; 1.2 Nm)
25/5	eShop	18	1	35	M12	229713 (8IP; 1.2 Nm)
28/4	eShop	21	1	35	M12	229713 (8IP; 1.2 Nm)
32/5	eShop	25	1	40	M16	229713 (8IP; 1.2 Nm)
32/6	eShop	25	1	40	M16	229713 (8IP; 1.2 Nm)
35/6	eShop	28	1	40	M16	229713 (8IP; 1.2 Nm)
40/5	eShop	33	1	40	M16	229713 (8IP; 1.2 Nm)
42/7	eShop	35	1	40	M16	229713 (8IP; 1.2 Nm)



Ø D / number of effective cutting edges Z	250 22 1965	Ø D ₃	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø	Insert screw
	High feed rate milling cutter					
	MFH mini with bore					
mm		mm	mm	mm	mm	
40/5	eShop	33	1	40	16	229713 (8IP; 1.2 Nm)
40/7	eShop	33	1	40	16	229713 (8IP; 1.2 Nm)
42/7	eShop	35	1	40	16	229713 (8IP; 1.2 Nm)
50/8	eShop	43	1	40	22	229713 (8IP; 1.2 Nm)
52/8	eShop	45	1	40	22	229713 (8IP; 1.2 Nm)
63/8	eShop	56	1	40	22	229713 (8IP; 1.2 Nm)



KYOCERA Milling insert LOGU 0303.. for high feed rate indexable milling cutter MFH mini

Double-sided indexable insert with 4 cutting edges. The convex cutting edge version of the insert ensures gentle entry of the cutting edge into the material.

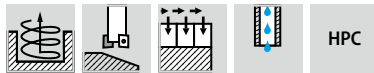
Note: Standard application values for $a_e = 0.3 \times D / a_{p \max} = 1 \text{ mm}$.

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si 	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Inconel ¹	GG(G)					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	S	K					
22 1971				200	180	160	140	100												○		●	●
22 1973														160	120	40				○		●	●
22 1975																		180		○		●	●
22 1976																	30			●		○	○

Type	ST1400	INOX	GG	S	f _z mm
25A 22 1971	PR1825	eShop	—	—	1 0.2 – 1.5
25A 22 1973	PR1835	—	eShop	—	1 0.2 – 1.9
25A 22 1975	PR1810	—	—	eShop	1 0.2 – 1.5
25A 22 1976	CA6535	—	—	eShop	1 0.2 – 0.8
Programming radius at a _{p max}	mm 1.6				



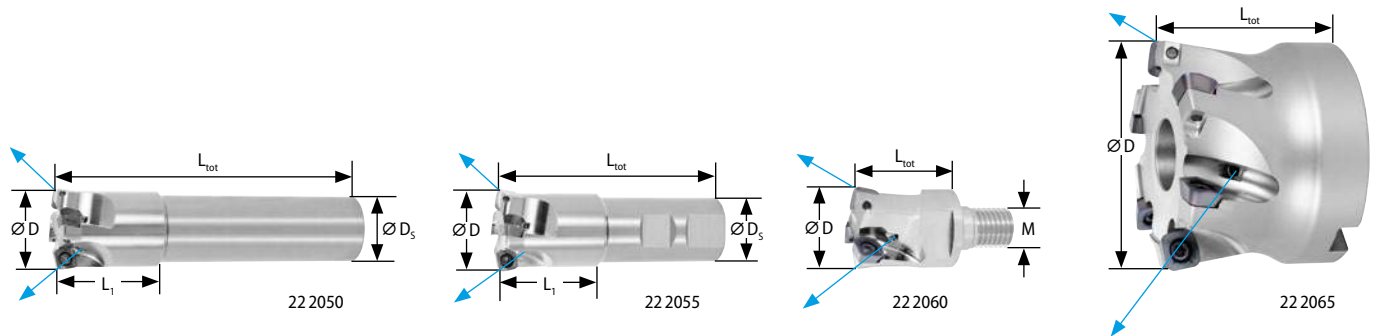
22 1976



KYOCERA MFH Harrier high feed rate indexable milling cutter for SOMT.. indexable inserts

Description: MFH Harrier high feed rate indexable face mills enable short machining times thanks to high feed rates and high cutting depths. The approach angle in combination with the convex cutting edges reduces the cutting forces and minimises the tendency to vibrate.

Application: For increased productivity in face milling, pocket milling and slot milling. Because the cutting forces are so low, large overhangs for plunge milling pose no problem.



Ø D / number of teeth Z	250	22 2050	250	22 2055	Number of cut- ting edges Z	maximum cut- ting depth a _{p max}	a _{p max} for LD ge- ometry	L ₁	L _{tot}		Ø D _s h6	Indexable insert size	Insert screw
	High feed rate milling cutter								22 2050	22 2055			
	MFH Harrier												
mm	Plain shank	Weldon shank				mm	mm	mm	mm	mm			
25/2	eShop	eShop			2	1.5	3.5	60	140	117	25	10	229717 (15IP; 3.5 Nm)
28/2	eShop	—			2	1.5	3.5	40	140	—	25	10	229717 (15IP; 3.5 Nm)
32/3	eShop	eShop			3	1.5	3.5	70	150	131	32	10	229717 (15IP; 3.5 Nm)
35/3	eShop	—			3	1.5	3.5	50	150	—	32	10	229717 (15IP; 3.5 Nm)
40/4	eShop	eShop			4	1.5	3.5	50	150	112	32	10	229717 (15IP; 3.5 Nm)
50/3	eShop	—			3	2	5	50	150	—	42	14	229719 (20 IP; 4.5 Nm)
63/4	eShop	—			4	2	5	50	150	—	42	14	229719 (20 IP; 4.5 Nm)
80/5	eShop	—			5	2	5	50	150	—	42	14	229719 (20 IP; 4.5 Nm)

Ø D / number of teeth Z	250	22 2060	Number of cutting edges Z	maximum cutting depth a _{p max}	a _{p max} for LD geometry	L _{tot}	Mounting thread M	Indexable insert size	Insert screw
	High feed rate milling cutter								
mm	MFH Harrier with threaded shank			mm	mm	mm			
25/2	eShop		2	1.5	3.5	35	M12	10	229717 (15IP; 3.5 Nm)
28/2	eShop		2	1.5	3.5	35	M12	10	229717 (15IP; 3.5 Nm)
32/3	eShop		3	1.5	3.5	40	M16	10	229717 (15IP; 3.5 Nm)
35/3	eShop		3	1.5	3.5	40	M16	10	229717 (15IP; 3.5 Nm)
40/4	eShop		4	1.5	3.5	40	M16	10	229717 (15IP; 3.5 Nm)

Ø D / number of teeth Z	250	22 2065	maximum cutting depth a _{p max}	a _{p max} for LD geometry	L _{tot}	Mounting bore Ø	Indexable insert size	Insert screw
	High feed rate milling cutter							
mm	MFH Harrier with bore		mm	mm	mm	mm		
50/4	eShop		1.5	3.5	50	22	10	229718 (15IP; 3.5 Nm)
50/5	eShop		1.5	3.5	50	22	10	229718 (15IP; 3.5 Nm)
52/4	eShop		1.5	3.5	50	22	10	229718 (15IP; 3.5 Nm)
52/5	eShop		1.5	3.5	50	22	10	229718 (15IP; 3.5 Nm)
63/5	eShop		1.5	3.5	50	22	10	229718 (15IP; 3.5 Nm)
63/6	eShop		1.5	3.5	50	22	10	229718 (15IP; 3.5 Nm)
63/5S	eShop		1.5	3.5	50	27	10	229718 (15IP; 3.5 Nm)
63/6S	eShop		1.5	3.5	50	27	10	229718 (15IP; 3.5 Nm)
80/7	eShop		1.5	3.5	63	27	10	229718 (15IP; 3.5 Nm)
63/5L	eShop		2	5	50	22	14	229719 (20 IP; 4.5 Nm)
63/5SL	eShop		2	5	50	27	14	229719 (20 IP; 4.5 Nm)
66/5L	eShop		2	5	50	22	14	229719 (20 IP; 4.5 Nm)
66/5SL	eShop		2	5	50	27	14	229719 (20 IP; 4.5 Nm)
80/6	eShop		2	5	63	27	14	229719 (20 IP; 4.5 Nm)
100/7	eShop		2	5	63	32	14	229719 (20 IP; 4.5 Nm)
125/7	eShop		2	5	63	40	14	229719 (20 IP; 4.5 Nm)

KYOCERA Milling inserts SOMT.. for MFH Harrier high feed rate indexable milling cutters

4-edge indexable inserts with convex cutting edges for low cutting forces.

Application:

22 2071–2076 – **FL geometry** is the first choice for general machining.

22 2079–2084 – **LD geometry** is also suitable for high cutting depths ($a_{p\max} = 5$ mm) at moderate feed rates. Do not use for helical, plunging or contour milling, or on steep walls.

22 2087–2092 – **FL geometry** (surface-oriented) is the first choice for roughing on lower-powered machines. Do not use for helical, plunging or contour milling, or on steep walls.

Note: Standard application values for $a_e = 0.3 \times D$.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si										INOX	INOX	Ti	Inconel*	GG(G)					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	S	K				
PR1825				200	180	160	140	100											○		●	●
PR1835													160	120	40				○		●	●
PR1810																	180		○		●	●
CA6535																30			○		●	●



22 2079_10



22 2076_14

Type		10	14	
25A 22 2071	SOMT.....20ER-GM	PR1825	eShop	1
25A 22 2073		PR1835	eShop	1
25A 22 2075		PR1810	eShop	1
25A 22 2076		CA6535	eShop	1
25A 22 2079	SOMT.....20ER-LD	PR1825	eShop	1
25A 22 2081		PR1835	eShop	1
25A 22 2083		PR1810	eShop	1
25A 22 2084		CA6535	eShop	1
25A 22 2087	SOMT.....ER-FL	PR1825	eShop	1
25A 22 2089		PR1835	eShop	1
25A 22 2091		PR1810	eShop	1
25A 22 2092		CA6535	eShop	1
Programming radius at $a_{p\max}$ (22 2071, 22 2073, 22 2075, 22 2076)	mm	3	3.5	
Programming radius at $a_{p\max}$ (22 2079, 22 2081, 22 2083, 22 2084)	mm	3.5	5	
Programming radius at $a_{p\max}$ (22 2087, 22 2089, 22 2091, 22 2092)	mm		3	
f_z (22 2071)	mm		0.2 – 2	
f_z (22 2073, 22 2089)	mm		0.5 – 1.8	
f_z (22 2075, 22 2091)	mm		0.5 – 2	
f_z (22 2076)	mm		0.5 – 1.2	
f_z (22 2079)	mm		0.03 – 2	
f_z (22 2081)	mm		0.06 – 1.8	
f_z (22 2083)	mm		0.06 – 2	
f_z (22 2084)	mm		0.03 – 1.2	
f_z (22 2087, 22 2092)	mm		0.2 – 1.2	

KYOCERA MFAH – highly efficient milling cutters for finish machining of aluminium

Wide range with different types of cutting edge
for a **wide variety of milling applications.**

Steel or hybrid body with through-coolant.

Low cutting forces minimise the formation of burrs
and chip abrasion, and ensure **high-quality machining results.**



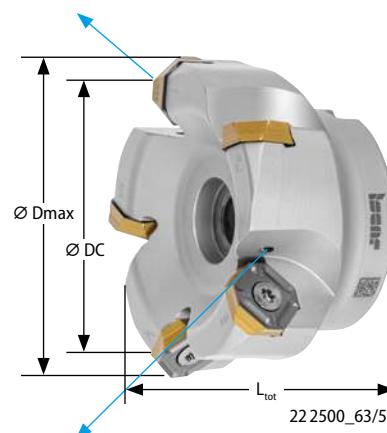


DOVEIQMILL face mill 50° for inserts SYHU0704..

Extremely stable face milling system. The indexable inserts are fixed by means of screw clamping and by additional fixing in a dovetail-like insert seating. The positive axial installation position of the plates results in a very soft cut and thus guarantees the best surface qualities. Maximum **cost-effectiveness** due to 8-cutter indexable inserts.

Spare part: Pack of insert screws No. **229695 4** (IP15; 4.8 Nm).

Ø D _c / number of effective cutting edges Z	19D 22 2500 DOVEIQMILL face mill with bore	maximum cutting depth a _{p max}	Ø D _{max}	L _{tot}	Mounting bore Ø
mm		mm	mm	mm	mm
50/4	—	4.6	59.4	40	22
50/5	—	4.6	59.4	40	22
63/5	—	4.6	72.4	40	22
63/7	—	4.6	72.4	40	22
80/6	—	4.6	89.4	50	27
80/8	—	4.6	89.4	50	27
100/7	—	4.6	109.4	50	32
100/10	—	4.6	109.4	50	32
125/9	—	4.6	134.4	63	40
125/12	—	4.6	134.4	63	40
160/11	—	4.6	169.4	63	40



DOVEIQMILL milling inserts SYHU0704.. for face mill 50°

Double-sided indexable insert with 8 cutting edges. Large flat chamfer for high surface qualities. Positive rake angle for optimum chip breaking.

Note: Standard application values for a_e = 0.6 to 1.0×D / a_{p max} = 4.6 mm.
The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	Y < 500 N	Y < 750 N	Y < 900 N	Y < 1100 N	Y < 1400 N	Y < 55 HRC	Y < 60 HRC	Y < 65 HRC	Y < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG < 300 N	GGG < 220 N	Uni	Oil	Water	Chips	Swarf
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	K					
22 2510	500	480	400																	●		
22 2511				200	170	160	140	130												○		●
22 2512				200	170	160	140	130												○		●
22 2513				220	190	160	140	130												○		●
22 2514				240	220	200	180	160												○		●
22 2515													120	110						○		●
22 2516													140	140						○		●
22 2517													140	130						○		●
22 2518															45					○		●
22 2519																300	220			○		●
22 2520/2521																270	220			○		●
22 2522				190	170	150	130						90	80				●		○		●



22 2510 22 2512 22 2513 22 2516 22 2518 22 2519 22 2520 22 2522

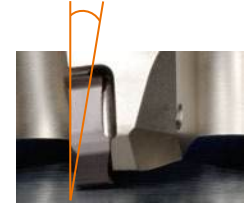
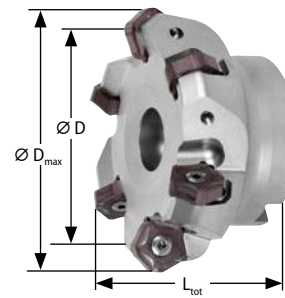
Type			ALU	ST900	ST1400	INOX	S	GG	GGG	UNI	
19A 22 2510	SYHU 0704ADN-P	IC28	—	—	—	—	—	—	—	—	10
19A 22 2511	SYHU 0704ADN	IC830	—	—	—	—	—	—	—	—	10
19A 22 2512	SYHU 0704ADN-MM	IC5400	—	—	—	—	—	—	—	—	10
19A 22 2513	SYHU 0704ADN-MM	IC830	—	—	—	—	—	—	—	—	10
19A 22 2514	SYHU 070400N-MM	IC830	—	—	—	—	—	—	—	—	10
19A 22 2515	SYHU 0704ADN	IC330	—	—	—	—	—	—	—	—	10
19A 22 2516	SYHU 0704ADN	IC840	—	—	—	—	—	—	—	—	10
19A 22 2517	SYHU 070400ADN	IC830	—	—	—	—	—	—	—	—	10
19A 22 2518	SYHU 070400AD	IC882	—	—	—	—	—	—	—	—	10
19A 22 2519	SYHU 0704ADTN	IC5100	—	—	—	—	—	—	—	—	10
19A 22 2520	SYHU 0704ADTN	IC810	—	—	—	—	—	—	—	—	10
19A 22 2521	SYHU 070400ADTN	IC810	—	—	—	—	—	—	—	—	10
19A 22 2522	SYHU 0704DN-MM	IC808	—	—	—	—	—	—	—	—	10
f _z		mm	0.25	0.2	0.18	0.16	0.15	0.25	0.25	—	



HPC

KYOCERA Indexable face mill 47.5° MFPN45 for PN.U 1205 milling inserts

High performance face milling cutter with double-sided pentagonal indexable inserts. The combination of approach angle, chip chamber design as well as the geometries and cutting angles of the indexable inserts ensure outstanding metal removal rates, chip clearance, working life, and low cutting forces, and hence high cost-effectiveness.



Low cutting force due to high axial rake (maximum +10°).

Ø D / number of teeth Z	250 22 2800 Indexable face mill 47.5° MFPN45	maximum cutting depth $a_{p\max}$	Ø D _{max}	L _{tot}	Mounting bore Ø	Insert screw	Shim	Clamp screw for shim
mm	with bore	mm	mm	mm	mm			
63/5	eShop	6	76	40	22	229700	—	—
63/6	eShop	6	76	40	22	229701	—	—
80/5	eShop	6	93	50	27	229700	229750	229702 (SW5; 6.0 Nm)
80/6	eShop	6	93	50	27	229700	—	—
100/8	eShop	6	113	50	32	229700	—	—
100/10	eShop	6	113	50	32	229701	—	—
125/10	eShop	6	138	63	40	229700	—	—
125/13	eShop	6	138	63	40	229701	—	—
160/8	eShop	6	173	63	40	229700	229750	229702 (SW5; 6.0 Nm)
160/12	eShop	6	173	63	40	229700	—	—
200/10	eShop	6	213	63	60	229700	229750	229702 (SW5; 6.0 Nm)
200/14	eShop	6	213	63	60	229700	—	—
250/12	eShop	6	263	63	60	229700	229750	229702 (SW5; 6.0 Nm)
250/16	eShop	6	263	63	60	229700	—	—

KYOCERA Indexable inserts PN... for indexable face mill No. 222800

22 2825/2826 – WIPER indexable inserts for the best surface quality. Only 1 wiper indexable insert per set.

Make sure it is fitted correctly!

Note: Standard application values for $a_e = 0.3 \times D$.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	Y < 500 N	Y < 750 N	Y < 900 N	Y < 1100 N	Y < 1400 N	Y < 55 HRC	Y < 60 HRC	Y < 65 HRC	Y < 67 HRC	Y < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
PR1525 / PR1535				200	180	180	140	140						150	140		180	●		○	○	●	●
PR1510														240	220	40	180			○	○	●	●
CA6535														150	140		180			○	○	●	●
TN100M				200	180	180	140	140									180			○	○	●	●



Type			ST1400	INOX	GG	S	UNI	
25A 22 2805	PNMU 1205 ANER-GM	PR1525	eShop	—	—	—	—	10
25A 22 2806	PNMU 1205 ANER-SM	PR1525	eShop	—	—	—	—	1
25A 22 2807	PNMU 1205 ANER-GH	PR1525	eShop	—	—	—	—	1
25A 22 2812	PNMU 1205 ANER-SM	PR1535	—	eShop	—	—	—	1
25A 22 2814	PNMU 1205 ANER-GM	PR1510	—	—	eShop	—	—	1
25A 22 2815	PNMU 1205 ANER-GH	PR1510	—	—	eShop	—	—	1
25A 22 2818	PNEU 1205 ANER-GL	PR1510	—	—	eShop	—	—	1
25A 22 2819	PNMU 1205 ANER-SM	CA6535	—	—	—	eShop	—	1
25A 22 2822	PNEU 1205 ANER-GL	PR1525	—	—	—	—	eShop	1
25A 22 2825	PNEU 1205 ANER-Wiper	TN100M	eShop	—	—	—	—	1
25A 22 2826	PNEU 1205 ANER-Wiper	PR1525	eShop	—	—	—	—	1
f _r (22 2805, 22 2812, 22 2814, 22 2819)	mm		0.11 – 0.38	0.07 – 0.27	0.11 – 0.44	0.06 – 0.15	—	
f _r (22 2806, 22 2815, 22 2818)	mm		0.07 – 0.27	—	0.06 – 0.25	—	—	
f _r (22 2807)	mm		0.2 – 0.65	—	—	—	—	

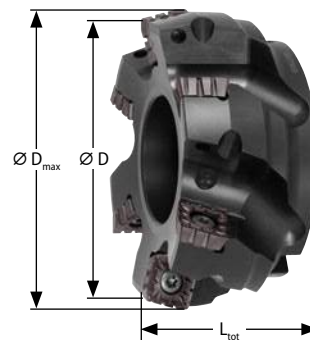


HPC

KYOCERA Indexable face mill 75° MSRS (Monster Square) for milling inserts SPMT 1806

Cutter head with normal and close-pitch cutter spacing.

Application: Cutting depths up to 12 mm and high feed rates for highly efficient roughing. The innovative notched indexable inserts reduce the cutting pressure, which in turn significantly reduces the tendency to vibrate. This allows a larger cutting width and a significantly increased rate of metal removal.



Ø D / number of teeth Z	25P 22 4000 Indexable face mill 75° MSRS	maximum cutting depth $a_{p\max}$	Ø D _{max}	L _{tot}	Mounting bore Ø	suitable indexable insert	Insert screw	Case	Screw for cartridge
mm	with bore	mm	mm	mm	mm				
80/4	eShop	12	87	50	27	SP. 1806	229703 (T25; 7.5 Nm)	229765	229704
80/6	eShop	12	87	50	27	SP. 1806	229703 (T25; 7.5 Nm)	—	—
100/4	eShop	12	107	50	32	SP. 1806	229703 (T25; 7.5 Nm)	229765	229704
100/6	eShop	12	107	50	32	SP. 1806	229703 (T25; 7.5 Nm)	—	—
125/6	eShop	12	132	60	40	SP. 1806	229703 (T25; 7.5 Nm)	229765	229704
125/8	eShop	12	132	60	40	SP. 1806	229703 (T25; 7.5 Nm)	—	—
160/8	eShop	12	167	60	40	SP. 1806	229703 (T25; 7.5 Nm)	229765	229704
160/10	eShop	12	167	60	40	SP. 1806	229703 (T25; 7.5 Nm)	—	—
200/10	eShop	12	207	60	60	SP. 1806	229703 (T25; 7.5 Nm)	229765	229704
200/12	eShop	12	207	60	60	SP. 1806	229703 (T25; 7.5 Nm)	—	—
250/12	eShop	12	257	60	60	SP. 1806	229703 (T25; 7.5 Nm)	229765	229704
250/14	eShop	12	257	60	60	SP. 1806	229703 (T25; 7.5 Nm)	—	—
315/14	eShop	12	322	60	60	SP. 1806	229703 (T25; 7.5 Nm)	229765	229704
315/16	eShop	12	322	60	60	SP. 1806	229703 (T25; 7.5 Nm)	—	—

KYOCERA Indexable inserts for indexable face mill 75° MSRS (Monster Square)

Special indexable insert geometry ensures reduced cutting forces and improved chip breaking. All types with **wiper cutters** for high feed rates.

Application:

22 4012/4013 – **NB2 / NB3:** General application

22 4018/4019/4030/4031 – **NB2T / NB3T:** Ideal for **interrupted cutting**, high cutting speeds and high feed rates.

22 4024/4025 – **NB2P / NB3P:** For **reduced cutting forces**. Specially for large overhangs and thin workpieces.

Note: The milling cutters are alternately equipped with equal numbers of indexable inserts of forms NB2 and NB3. Comply with the assignment instructions on the cutter.
Standard application values for $a_e = 1 \times D$.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	< 900 N	> 900 N	> 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
PR1835				200	180	180	160	160												○	○	●	●
PR1810																	180			○	○	●	●

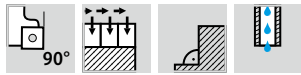


22 4013



22 4030

Type			ST1400	GG		Application
25A 22 4012	SPMT 1806 EDER-NB2	PR1835	eShop	—	1	Standard
25A 22 4013	SPMT 1806 EDER-NB3	PR1835	eShop	—	1	Standard
25A 22 4018	SPMT 1806 EDSR-NB2T	PR1835	eShop	—	10	Roughing
25A 22 4019	SPMT 1806 EDSR-NB3T	PR1835	eShop	—	10	Roughing
25A 22 4024	SPMT 1806 EDER-NB2P	PR1835	eShop	—	1	soft-cutting
25A 22 4025	SPMT 1806 EDER-NB3P	PR1835	eShop	—	1	soft-cutting
25A 22 4030	SPMT 1806 EDSR-NB2T	PR1810	—	eShop	1	Roughing
25A 22 4031	SPMT 1806 EDSR-NB3T	PR1810	—	eShop	1	Roughing
f _t (22 4012, 22 4013, 22 4018, 22 4019, 22 4030)	mm		0.06 – 0.25	0.06 – 0.15		
f _t (22 4024, 22 4031)	mm		0.06 – 0.3	0.06 – 0.25		
f _t (22 4025)	mm		0.06 – 0.15	—		

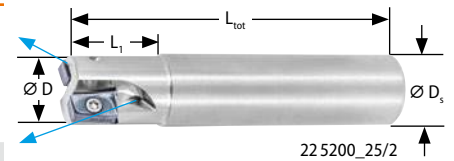


KYOCERA 90° indexable milling cutter MEW for milling inserts LOMU...

Cost-efficient due to 4 cutting edges.

22 5200 Size 16/2L – Without internal cooling.

Ø D / number of teeth Z	250 22 5200 Indexable milling cutter 90° MEW	maximum cutting depth $a_{p \max}$	L_1	L_{tot}	Ø D _s h6	Indexable insert size	Insert screw
mm	Plain shank	mm	mm	mm	mm		
16/2	eShop	10	26	100	16	10	229713 (8IP; 1.2 Nm)
16/2L	eShop	10	23	100	12	10	229713 (8IP; 1.2 Nm)
20/2L	eShop	10	40	150	20	10	229713 (8IP; 1.2 Nm)
20/3	eShop	10	30	110	20	10	229713 (8IP; 1.2 Nm)
25/3	eShop	10	32	120	25	10	229713 (8IP; 1.2 Nm)
25/3L	eShop	10	29	120	20	10	229713 (8IP; 1.2 Nm)
30/4L	eShop	10	32	130	25	10	229713 (8IP; 1.2 Nm)
32/4	eShop	10	40	130	32	10	229713 (8IP; 1.2 Nm)
32/4L	eShop	10	32	130	25	10	229713 (8IP; 1.2 Nm)
40/5L	(eShop)	10	50	150	32	10	229713 (8IP; 1.2 Nm)
50/5L	(eShop)	10	40	120	32	10	229713 (8IP; 1.2 Nm)
25/2	eShop	15	32	120	25	15	229714 (15IP; 3.5 Nm)
25/2L	eShop	15	29	120	20	15	229714 (15IP; 3.5 Nm)
32/2L	eShop	15	32	130	25	15	229714 (15IP; 3.5 Nm)
32/3	eShop	15	32	130	32	15	229714 (15IP; 3.5 Nm)
40/3L	(eShop)	15	50	150	32	15	229714 (15IP; 3.5 Nm)
40/4L	(eShop)	15	50	150	32	15	229714 (15IP; 3.5 Nm)
50/4L	(eShop)	15	40	120	32	15	229714 (15IP; 3.5 Nm)

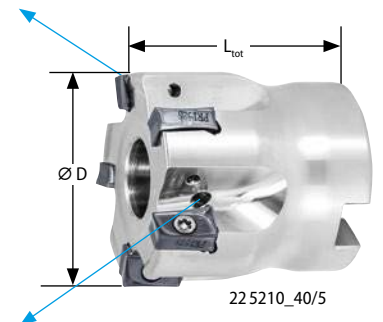


22 5200_25/2



22 5200_16/2L

Ø D / number of teeth Z	250 22 5210 Indexable milling cutter 90° MEW	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore Ø	Indexable insert size	Insert screw
mm	with bore	mm	mm	mm		
32/4	eShop	10	35	16	10	229713 (8IP; 1.2 Nm)
40/5	eShop	10	40	16	10	229713 (8IP; 1.2 Nm)
50/5	eShop	10	40	22	10	229713 (8IP; 1.2 Nm)
63/6	eShop	10	40	22	10	229713 (8IP; 1.2 Nm)
40/4	eShop	15	40	16	15	229714 (15IP; 3.5 Nm)
50/4	eShop	15	40	22	15	229714 (15IP; 3.5 Nm)
63/5	eShop	15	40	22	15	229714 (15IP; 3.5 Nm)
80/6	eShop	15	50	27	15	229714 (15IP; 3.5 Nm)



22 5210_40/5

KYOCERA Indexable inserts LOMU.. for indexable milling cutter No. 225200 / 225210

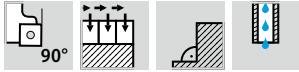
MEGACOAT-coated indexable inserts with 4 edges – due to double-sided version. The high axial rake angle up to a maximum of 10° significantly reduces the cutting force.

Note: Standard application values for $a_c = 0.3 \times D$.

Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
PR1525				200	180	160	140	140						160	150					○	○	●	●
PR1535														170	160	50				○	○	●	●
PR1510																50	180			○	○	●	●

Indexable insert size	10	15		f_z mm
25A 22 5220 LOMU...04ER-GM PR1525	eShop	eShop	10	0.06 – 0.25
25A 22 5225 LOMU...08ER-GM PR1525	eShop	eShop	10	0.06 – 0.25
25A 22 5226 LOMU...12ER-GM PR1525	eShop	eShop	1	0.06 – 0.25
25A 22 5227 LOMU...08ER-GH PR1525	eShop	eShop	1	0.06 – 0.3
25A 22 5235 LOMU...08ER-SM PR1525	eShop	eShop	1	0.06 – 0.15
25A 22 5237 PR1535	eShop	eShop	1	0.06 – 0.15
25A 22 5240 LOMU...08ER-GM PR1510	eShop	eShop	1	0.06 – 0.25
Type (22 5220, 22 5225, 22 5226, 22 5227)	ST1400			
Type (22 5235, 22 5237)	INOX			
Type (22 5240)	GG			





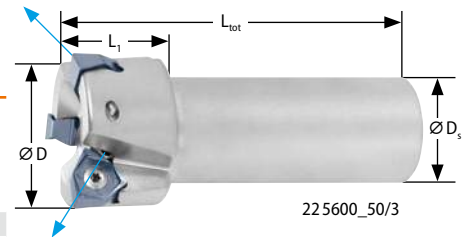
KYOCERA 90° indexable milling cutter MFWN for indexable inserts WNMU 0806..

Milling cutter with double-sided indexable inserts.

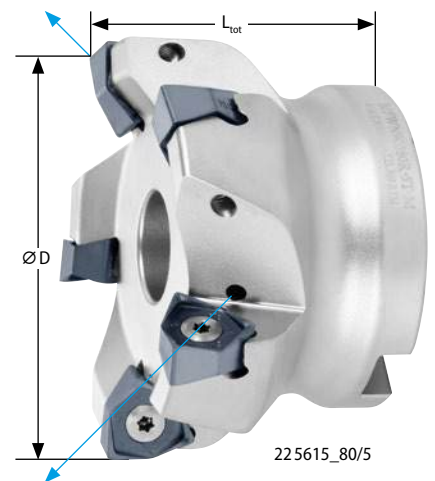
The combination of approach angle, chip chamber design as well as the geometries and cutting angles of the indexable inserts ensure outstanding metal removal rates, chip clearance, working life, and low cutting forces, and hence high cost-effectiveness.

Size 160/8–250/14 – Without internal cooling.

Ø D / number of teeth Z	250	22 5600	maximum cutting depth $a_{p \max}$	L_1	L_{tot}	Ø D _s h6	Insert screw
mm		Indexable milling cutter 90° MFWN	mm	mm	mm	mm	
		Plain shank					
50/3		eShop	8	30	110	32	229700 (T15; 4.2 Nm)
63/4		eShop	8	30	110	32	229700 (T15; 4.2 Nm)
80/5		eShop	8	30	110	32	229700 (T15; 4.2 Nm)



Ø D / number of teeth Z	250	22 5615	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore Ø	Insert screw	Shim
mm		Indexable milling cutter 90° MFWN	mm	mm	mm		
		with bore					
50/4		eShop	8	40	22	229700 (T15; 4.2 Nm)	–
63/3		eShop	8	40	22	229700 (T15; 4.2 Nm)	229751
63/4		eShop	8	40	22	229700 (T15; 4.2 Nm)	–
63/5		eShop	8	40	22	229700 (T15; 4.2 Nm)	–
80/4		eShop	8	50	27	229700 (T15; 4.2 Nm)	229751
80/5		eShop	8	50	27	229700 (T15; 4.2 Nm)	–
80/7		eShop	8	50	27	229701 (T15; 3.5 Nm)	–
100/5		(eShop)	8	50	32	229700 (T15; 4.2 Nm)	229751
100/7		eShop	8	50	32	229700 (T15; 4.2 Nm)	–
100/9		(eShop)	8	50	32	229701 (T15; 3.5 Nm)	–
125/6		(eShop)	8	63	40	229700 (T15; 4.2 Nm)	229751
125/8		eShop	8	63	40	229700 (T15; 4.2 Nm)	–
125/12		(eShop)	8	63	40	229701 (T15; 3.5 Nm)	–
160/8		(eShop)	8	63	40	229700 (T15; 4.2 Nm)	229751
160/10		(eShop)	8	63	40	229700 (T15; 4.2 Nm)	–
160/14		eShop	8	63	40	229701 (T15; 3.5 Nm)	–
200/10		(eShop)	8	63	60	229700 (T15; 4.2 Nm)	229751
200/12		(eShop)	8	63	60	229700 (T15; 4.2 Nm)	–
250/12		(eShop)	8	63	60	229700 (T15; 4.2 Nm)	229751
250/14		(eShop)	8	63	60	229700 (T15; 4.2 Nm)	–



KYOCERA Indexable inserts WNMU.. for indexable milling cutter No. 225600 / 225615

MEGACOAT-coated indexable inserts with **6 edges** – due to double-sided version. The high axial rake angle up to a maximum of 13° significantly reduces the cutting force.

22 5627–5630 – Ground version for significantly better surface quality.

Application:

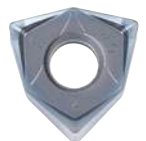
22 5621 – The **GH geometry** is the first choice for roughing applications.

22 5620/5626 – The **GM geometry** is the first choice for general machining.

22 5623/5625 – The **SM geometry** has a highly positive rake and cuts smoothly.

22 5627–5630 – The **GL geometry** is suitable for good surface finishes thanks to the ground version and flat cutting edge.

Note: Standard application values for $a_e = 0.3 \times D$.



22 5620_ST1400

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	H	M	M	S	K						
PR1525				200	180	160	140	140							160	150			●		○	○	●	●
PR1535															160	150					○	○	●	●
PR1510																	50	180			○	○	●	●
CA6535															240	200	40				○	○	●	●

Type			ST1400	INOX	GG	S	UNI		f_z mm
25A 22 5620	WNMU 080608 EN-GM	PR1525	eShop	–	–	–	–	10	0.1 – 0.3
25A 22 5621	WNMU 080608 EN-GH	PR1525	eShop	–	–	–	–	1	0.2 – 0.4
25A 22 5623	WNMU 080608 EN-SM	PR1525	–	eShop	–	–	–	1	0.06 – 0.2
25A 22 5625	WNMU 080608 EN-SM	PR1535	–	eShop	–	–	–	1	0.06 – 0.2
25A 22 5626	WNMU 080608 EN-GM	PR1510	–	–	eShop	–	–	1	0.1 – 0.3
25A 22 5627	WNMU 080608 EN-GM	PR1510	–	–	eShop	–	–	1	0.06 – 0.2
25A 22 5628	WNEU 080608 EN-GL	CA6535	–	–	–	eShop	–	1	0.06 – 0.1
25A 22 5630	WNEU 080608 EN-GL	PR1525	–	–	–	–	eShop	1	0.06 – 0.15



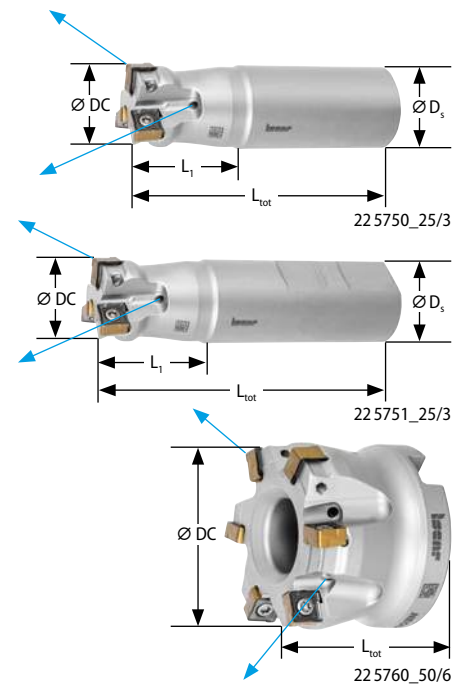
NEODO face / shoulder mill for inserts SZ.U0804..

Highly efficient milling system for facing and milling 90° shoulders. For roughing and pre-finishing especially of steel and cast iron materials. Cost-effective due to 8 cutting edges per indexable insert. Extremely stable embedding for the inserts in a dovetail-shaped insert seating.

Spare part: Pack of insert screws No. **229696 3** (IP9; 2.0 Nm).

Ø D _c / number of effective cutting edges Z	19D	22 5750	19D	22 5751	maximum cutting depth a _{p max}	L ₁	L _{tot}	Ø D _s h6
		NEODO indexable face / shoulder mill						
mm		Plain shank		Weldon shank	mm	mm	22 5750 mm	22 5751 mm
25/3		—		—	5	35	120	95
32/4		—		—	5	45	130	110

Ø D _c / number of effective cutting edges Z	19D	22 5760	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø
		NEODO indexable face / shoulder mill			
mm		with bore	mm	mm	mm
32/4		—	5	32	16
40/5		—	5	35	16
40/6		—	5	35	16
50/6		—	5	40	22
50/8		—	5	40	22
63/7		—	5	40	22
63/10		—	5	40	22
80/8		—	5	50	27
80/12		—	5	50	27
100/10		—	5	50	32
100/14		—	5	50	32
125/12		—	5	50	40
125/18		—	5	50	40



NEODO milling inserts SZ.U for face / shoulder mill

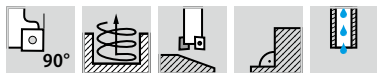
Double-sided indexable insert with 8 helical cutting edges. Special cutting edge geometry for smooth cutting to reduce power consumption during machining.

Note: Standard application values for $a_e = 0.3$ to $1 \times D / a_{p \max} = 5.0$ mm.
The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG	GGG					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	K					
22 5800/5804				200	180	170	150	140												○	●	●	●
22 5801				180	170	150	140	130												●	●	●	●
22 5802				160	150	140	120	110												○	●	●	●
22 5803				190	180	170	150	140												○	●	●	●
22 5805				200	190	180	170	150												○	●	●	●
22 5806														140	120					○	●	●	●
22 5807																45				○	●	●	●
22 5808/5809																	300	240		○	●	●	●
22 5810/5811																	280	260		○	●	●	●
22 5812				180	170	150	140							90	80					○	●	●	●
22 5813				170	160	140	130							90	80					○	●	●	●

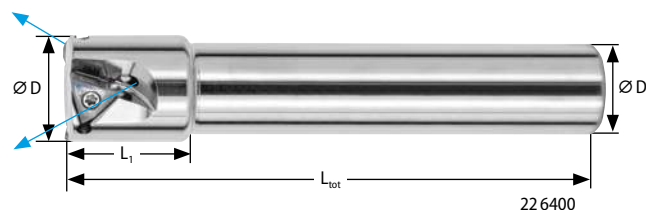


Type	ST900	ST1400	INOX	S	GG	GGG	UNI	
19A 22 5800 SZMU 080408PNRMM IC5600	—	—	—	—	—	—	—	10
19A 22 5801 SZMU 080412PNRMM IC808	—	—	—	—	—	—	—	10
19A 22 5802 SZMU 080412PNRMM IC845	—	—	—	—	—	—	—	10
19A 22 5803 SZMU 080412PNRMM IC5400	—	—	—	—	—	—	—	10
19A 22 5804 SZMU 080408PNRMM IC5600	—	—	—	—	—	—	—	10
19A 22 5805 SZMU 080408PNRMM IC830	—	—	—	—	—	—	—	10
19A 22 5806 SZMU 080408PNRHP IC830	—	—	—	—	—	—	—	10
19A 22 5807 SZHU 080408PNR IC882	—	—	—	—	—	—	—	10
19A 22 5808 SZMU 080408PNTR IC5100	—	—	—	—	—	—	—	10
19A 22 5809 SZMU 080412PNTR IC5100	—	—	—	—	—	—	—	10
19A 22 5810 SZMU 080408PNTR IC810	—	—	—	—	—	—	—	10
19A 22 5811 SZMU 080412PNTR IC810	—	—	—	—	—	—	—	10
19A 22 5812 SZMU 080408PNRMM IC808	—	—	—	—	—	—	—	10
19A 22 5813 SZMU 080412PNRMM IC830	—	—	—	—	—	—	—	10
f _z	mm	0.25	0.2	0.15	0.12	0.25	0.25	—



KYOCERA MEV 90° indexable milling cutter for indexable inserts TOMT060508

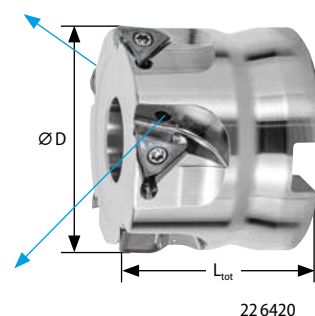
High-performance milling cutter with newly developed triangular indexable insert for corner and slot milling and ramping with lower cutting forces and increased stability.



Ø D / number of teeth Z	250	22 6400	maximum cutting depth	L _i	L _{tot}	Ø D _i h6	Insert screw
	Indexable milling cutter 90° MEV		a _{p max}				
mm	Plain shank		mm	mm	mm	mm	
20/2	eShop		6	26	110	16	229723 1 (10IP; 2.0 Nm)
20/2L	eShop		6	40	150	20	229723 1 (10IP; 2.0 Nm)
25/3	eShop		6	29	120	20	229723 1 (10IP; 2.0 Nm)
25/2L	eShop		6	50	170	25	229723 1 (10IP; 2.0 Nm)
32/4	eShop		6	32	130	25	229723 1 (10IP; 2.0 Nm)
32/2L	eShop		6	65	200	32	229723 1 (10IP; 2.0 Nm)
40/5	eShop		6	50	150	32	229723 1 (10IP; 2.0 Nm)
50/5	eShop		6	40	120	32	229723 1 (10IP; 2.0 Nm)

Ø D / number of teeth Z	22 6410	maximum cutting depth	L _{tot}	Mounting thread M	Insert screw
	Indexable milling cutter 90° MEV	a _{p max}			
mm	with threaded shank	mm	mm		
20/3	eShop	6	30	M10	229723 1 (10IP; 2.0 Nm)
25/3	eShop	6	35	M12	229723 1 (10IP; 2.0 Nm)
32/4	eShop	6	40	M16	229723 1 (10IP; 2.0 Nm)

Ø D / number of teeth Z	250	22 6420	maximum cutting depth $a_{p \max}$	L_{tot}	Mounting bore Ø	Insert screw
mm		Indexable milling cutter 90° MEV with bore	mm	mm	mm	
32/4		eShop	6	35	16	229723 1 (10IP; 2.0 Nm)
40/5		eShop	6	40	16	229723 1 (10IP; 2.0 Nm)
50/5		eShop	6	40	22	229723 1 (10IP; 2.0 Nm)



**KYOCERA Indexable inserts TOMT060508 for 90° indexable milling cutters MEV
No. 226400 / 226410 / 226420**

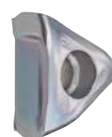
Improved chip evacuation with unique chip breaker design for the indexable inserts. The maximum axial rake angle of 17° ensures low cutting forces.

Application:

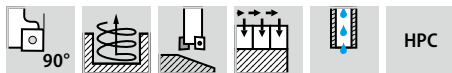
22 6430/6436/6442 –The GM geometry is the 1st choice for general machining.

22 6433/6439/6445 – The SM geometry is the 1st Choice for lower cutting forces.

Suitable for/ v _c [m/min]		Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	Ti	Graphite GRP CRP	Uni					
ISO code		N	N	N	P	P	P	P	P	H	H	H	H	H	< 900 N	> 900 N	> 850 N	N						
PR1525					200	180	160	140	140						M	M	S	N						
PR1535															200	160								
CA6535																	40							



Type			ST1400	INOX	S	
25A 22 6430	TOMT 060508ER-GM	PR1525	eShop	—	—	1
25A 22 6433	TOMT 060508ER-SM	PR1525	eShop	—	—	1
25A 22 6436	TOMT 060508ER-GM	PR1535	—	eShop	—	1
25A 22 6439	TOMT 060508ER-SM	PR1535	—	eShop	—	1
25A 22 6442	TOMT 060508ER-GM	CA6535	—	—	eShop	1
25A 22 6445	TOMT 060508ER-SM	CA6535	—	—	eShop	1
f _z (22 6430, 22 6436, 22 6442)	mm		0.08 – 0.25	0.08 – 0.2	0.08 – 0.2	
f _l (22 6433, 22 6439, 22 6445)	mm		0.08 – 0.2	0.08 – 0.15	0.08 – 0.15	

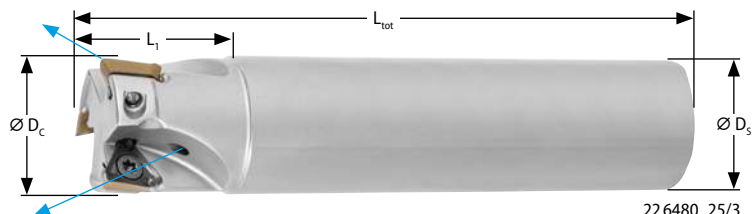


HELI3MILL shoulder mill 90° for inserts TP..1003.. and TD..1505..

Reliable shoulder milling system for a wide range of applications. Versions in two system sizes with cutting edge lengths in 10 and 15 mm. Optimally supported Trigon indexable inserts in the seat ensure true 90° shoulders. Ideally suited for circular interpolation milling operations and ramping.

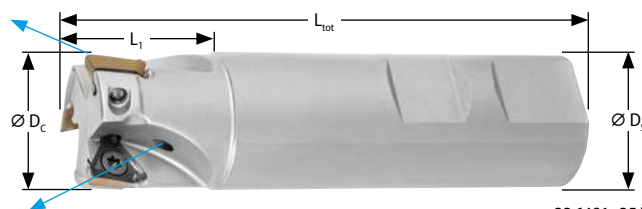
HELI3MILL shoulder mill 90° for TP..1003..

Spare part: Pack of indexable insert screws No. **229695 1** (TX10; 3.2 Nm).



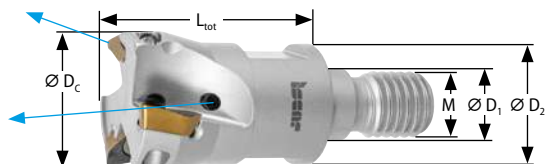
22 6480_25/3

Ø D _c / number of effective cutting edges Z	19D	22 6480	L ₁	L _{tot}	Ø D _s h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		HELI3MILL shoulder mill								
mm		Plain shank	mm	mm	mm	mm	mm	mm	degrees	mm
25/3		—	25	120	25	46.4	49	3.4	2.9	20
25/4		—	25	120	25	46.4	49	3.4	2.9	20
32/4L		—	40	200	32	60.4	63	3.3	2.1	27



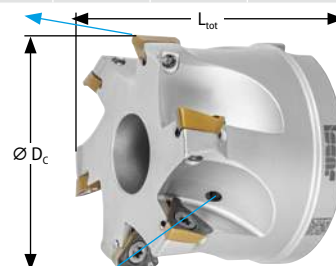
22 6481_25/3

Ø D _c / number of effective cutting edges Z	19D	22 6481	L ₁	L _{tot}	Ø D _s h6	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		HELI3MILL shoulder mill								
mm		Weldon shank	mm	mm	mm	mm	mm	mm	degrees	mm
25/3		—	25	95	25	46.4	49	3.4	2.9	20
32/4		—	30	110	32	60.4	63	3.3	2.1	27



22 6484_25/3

Ø D _c / number of effective cutting edges Z	19D	22 6484	L _{tot}	Mounting thread M	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		HELI3MILL shoulder mill							
mm		with threaded shank	mm		mm	mm	mm	degrees	mm
25/3		—	35	M12	46.4	49	3.4	2.9	20
32/4		—	35	M16	60.4	63	3.3	2.1	27



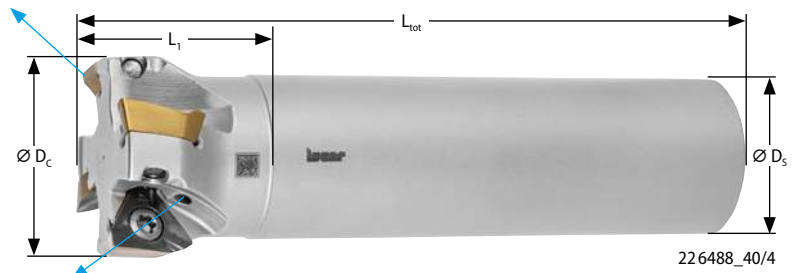
22 6486_50/6

Ø D _c / number of effective cutting edges Z	19D	22 6486	L _{tot}	Mounting bore Ø	Circular interpolation milling Ø D _{min}	Circular interpolation milling Ø D _{max}	Circular interpolation milling a _p	Ramping angle α _{max}	Ramping length L for α _{max}
		HELI3MILL shoulder mill							
mm		with bore	mm	mm	mm	mm	mm	degrees	mm
40/5		—	40	16	76.4	79	3.2	1.6	35
50/4		—	40	22	96.4	99	3.1	1.2	45
50/6		—	40	22	96.4	99	3.1	1.2	45
63/6		—	45	22	122.4	125	2.9	0.9	58
63/6S		—	45	27	122.4	125	2.9	0.9	58
63/7		—	45	22	122.4	125	2.9	0.9	58
63/7S		—	45	27	122.4	125	2.9	0.9	58
80/11S		—	50	27	156.4	159	3.4	0.8	75

HELI3MILL shoulder mill 90° for TD..1505..**Spare part:**

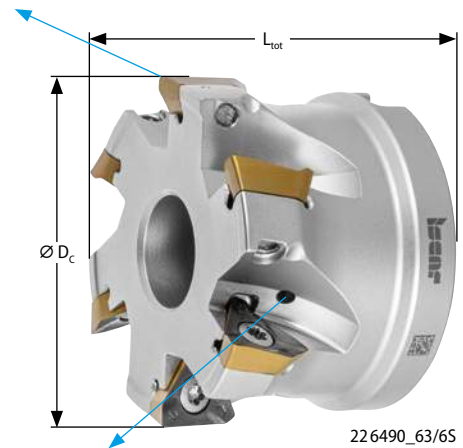
Size 40/4–50/5 – Pack of insert screws No. **229696 1**
(IP20; 9.0 Nm).

Size 63/5–125/9 – Pack of insert screws No. **229696 2**
(IP20; 9.0 Nm).



22 6488_40/4

$\varnothing D_c$ / number of effective cutting edges Z	19D	22 6488	L_1	L_{tot}	$\varnothing D_s$ h6	Circular interpolation milling $\varnothing D_{min}$	Circular interpolation milling $\varnothing D_{max}$	Circular interpolation milling a_p	Ramping angle α_{max}	Ramping length L for α_{max}
mm		HELI3MILL shoulder mill	mm	mm	mm	mm	mm	mm	degrees	mm
		Plain shank								
40/4		—	30	130	32	75	79	4	2.1	33
50/4		—	40	130	32	95	99	3.9	1.6	43



22 6490_63/65

$\varnothing D_c$ / number of effective cutting edges Z	19D	22 6490	L_{tot}	Mounting bore $\varnothing$	Circular interpolation milling $\varnothing D_{min}$	Circular interpolation milling $\varnothing D_{max}$	Circular interpolation milling a_p	Ramping angle α_{max}	Ramping length L for α_{max}
mm		HELI3MILL shoulder mill	mm	mm	mm	mm	mm	degrees	mm
		with bore							
40/4		—	40	16	75	79	4	2	33
50/4		—	40	22	95	99	3.9	1.6	43
50/5		—	40	22	95	99	3.9	1.6	43
63/5		—	45	22	121	125	3.8	1.2	56
63/5S		—	45	27	121	125	3.8	1.2	56
63/6		—	45	22	121	125	3.8	1.2	56
63/6S		—	45	27	121	125	3.8	1.2	56
80/5		—	50	27	155	159	3.7	0.9	73
80/6		—	50	27	155	159	3.7	0.9	73
80/7		—	50	27	155	159	3.7	0.9	73
100/6		—	50	32	195	199	3.6	0.7	93
100/8		—	50	32	195	199	3.6	0.7	93
125/7		—	63	40	245	249	3.3	0.5	118
125/9		—	63	40	245	249	3.3	0.5	118

- Quick application-related tool selection.
- Available to order directly from the Hoffmann Group eShop.
- Manufacturer and standard-related tool selection.
- Cutting data - direct selection.
- Tool information for reliable engineering.

You can find optimum cutting data, machining strategy and NC programs for your machine programming in the ThreadScout.





HELI3MILL milling inserts TP..1003.. and TD..1505.. for 90° shoulder mill

Trigon indexable insert with 3 helical cutting edges. Axial and radial positive cutting edge design. For effective and precise machining of 90° shoulders.

Note: The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K						
22 6499	640	560	320																				
22 6501/6502/6504 6518–22 6561/6571				300	280	260	240	220															
22 6503				320	280	260	240	220															
22 6506/6574				200	180	160	160	150															
22 6507/6508														140	110								
22 6509/6563/6564																50							
22 6511–22 6517/ 6582–22 6589/6597				220	200	170	150							110	90			●					
22 6562/6576/6577														130	110								
22 6573				220	200	170	160	150															
22 6579/6596																	240						
22 6581				240	220	200	180							110	90			●					

HELI3MILL milling inserts TP..1003..

22 6514 – With knuckle form profile for roughing.

Note: Standard application values for $a_e = 0.3$ to $1 \times D / a_p \text{ max} = 8.0 \text{ mm}$.

Type		ALU	ST900	ST1400	INOX	S	GGG	UNI	
19A 22 6499	TPCR 1003PDR-P	IC28	–	–	–	–	–	–	10
19A 22 6501	TPKT 100304PDR	IC808	–	–	–	–	–	–	10
19A 22 6502	TPKT 1003PDR	IC808	–	–	–	–	–	–	10
19A 22 6503	TPKT 1003PDR	IC5400	–	–	–	–	–	–	10
19A 22 6504	TPCT 1003PDR	IC808	–	–	–	–	–	–	10
19A 22 6518	TPKT 100310PDR	IC808	–	–	–	–	–	–	10
19A 22 6506	TPKT 1003PDR	IC845	–	–	–	–	–	–	10
19A 22 6507	TPCT 1003PDR	IC830	–	–	–	–	–	–	10
19A 22 6508	TPKR 100304PDR-HM	IC830	–	–	–	–	–	–	10
19A 22 6509	TPKT 1003PDR	IC882	–	–	–	–	–	–	10
19A 22 6596	TPKT 1003PDR	IC810	–	–	–	–	–	–	10
19A 22 6511	TPKT 100304PDR	IC830	–	–	–	–	–	–	10
19A 22 6512	TPKT 1003PDR-MP	IC830	–	–	–	–	–	–	10
19A 22 6513	TPKT 1003PDR	IC830	–	–	–	–	–	–	10
19A 22 6514	TPKT 1003PDR-FW	IC830	–	–	–	–	–	–	10
19A 22 6597	TPKT 100312PDR	IC830	–	–	–	–	–	–	10
19A 22 6516	TPKT 100316PDR	IC830	–	–	–	–	–	–	10
19A 22 6517	TPKT 100320PDR	IC830	–	–	–	–	–	–	10
f_z	mm	0.25	0.15	0.13	0.1	0.1	0.15	–	



22 6499



22 6506



22 6511

HELI3MILL milling inserts TD..1505..

22 6582 – With knuckle form profile for roughing.

Note: Standard application values for $a_e = 0.3$ to $1 \times D / a_p \text{ max} = 13.0 \text{ mm}$.

22 6579 – Standard application values for $a_e = 0.3 \times D$. Exactly 90° up to $a_p = 10 \text{ mm}$.

22 6582 – When mounted, the tool diameter D_c increases by approx. 1 mm.

Type		ST900	ST1400	INOX	S	GGG	UNI	
19A 22 6560	TDKT 1505PDR	IC808	–	–	–	–	–	10
19A 22 6571	TDCT 1505PDR	IC808	–	–	–	–	–	10
19A 22 6561	TDKT 150512-PDR	IC808	–	–	–	–	–	10
19A 22 6573	TDKT 1505PDR	IC830	–	–	–	–	–	10
19A 22 6574	TDKT 1505PDR	IC845	–	–	–	–	–	10
19A 22 6562	TDKT 150504PDR	IC830	–	–	–	–	–	10
19A 22 6576	TDCT 1505PDR	IC830	–	–	–	–	–	10
19A 22 6577	TDKR 150508PDRHM	IC830	–	–	–	–	–	10
19A 22 6563	TDKT 1505PDR	IC882	–	–	–	–	–	10
19A 22 6564	TDCT 1505PDR	IC882	–	–	–	–	–	10
19A 22 6579	TDKT 1505PDR	IC810	–	–	–	–	–	10
19A 22 6581	TDKT 1505PDR-MP	IC830	–	–	–	–	–	10
19A 22 6582	TDKT 1505PDR-FW	IC830	–	–	–	–	–	10
19A 22 6583	TDKT 150516-PDR	IC830	–	–	–	–	–	10
19A 22 6584	TDKT 150520-PDR	IC830	–	–	–	–	–	10
19A 22 6586	TDKT 150524-PDR	IC830	–	–	–	–	–	10
19A 22 6588	TDKT 150532-PDR	IC830	–	–	–	–	–	10
19A 22 6589	TDKT 150540-PDR	IC830	–	–	–	–	–	10
f_z	mm	0.25	0.21	0.2	0.15	0.21	–	



22 6560

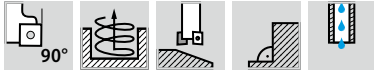


22 6563



22 6579

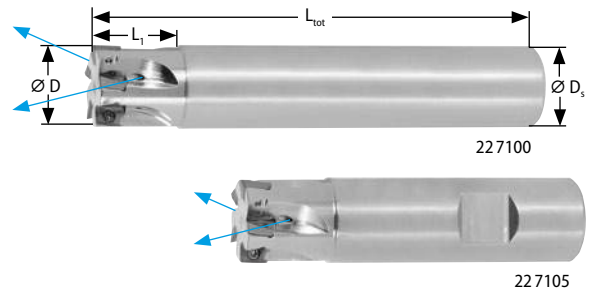
NEW



KYOCERA 90° indexable milling cutter MECX for indexable inserts BDMT 0703..

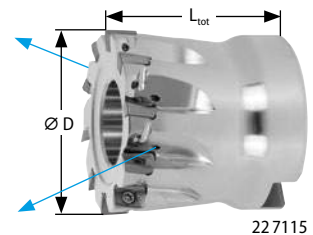
Description:

22 7100/7105 – Very close spacing provides improved productivity even under more unstable machining conditions. Low cutting forces and high stability for low tendency to vibrate. Permits various milling tasks such as milling shoulders and ramps etc.



Ø D / number of teeth Z	250 22 7100	250 22 7105	maximum cutting depth $a_{p\max}$	L_1	L_{tot}		Ø D _s h6	Insert screw
	Indexable milling cutter 90° MECX				22 7100	22 7105		
mm	Plain shank	Weldon shank	mm	mm	mm	mm	mm	
8/1	eShop	—	6	16	80	—	10	229706 (T6; 0.45 Nm)
10/1	eShop	—	6	17	80	—	10	229706 (T6; 0.45 Nm)
12/2	eShop	—	6	18	80	—	12	229706 (T6; 0.45 Nm)
14/2L	eShop	—	6	18	80	—	12	229706 (T6; 0.45 Nm)
16/3	eShop	eShop	6	20	100	68	16	229707 (T6; 0.45 Nm)
16/4	eShop	eShop	6	20	100	68	16	229707 (T6; 0.45 Nm)
17/3L	eShop	—	6	20	100	—	16	229707 (T6; 0.45 Nm)
18/3L	eShop	—	6	20	100	—	16	229707 (T6; 0.45 Nm)
20/4L	eShop	—	6	20	110	—	16	229707 (T6; 0.45 Nm)
20/5	eShop	eShop	6	20	110	81	20	229707 (T6; 0.45 Nm)
25/5L	eShop	—	6	25	120	—	20	229707 (T6; 0.45 Nm)
25/7	eShop	eShop	6	25	120	88	25	229707 (T6; 0.45 Nm)
26/5L	eShop	—	6	25	120	—	25	229707 (T6; 0.45 Nm)
32/8	eShop	—	6	30	130	—	32	229707 (T6; 0.45 Nm)

Ø D / number of teeth Z	250 22 7115	maximum cutting depth $a_{p\max}$	L_{tot}	Mounting bore Ø	Insert screw
	Indexable milling cutter 90° MECX				
mm	with bore	mm	mm	mm	
32/8	eShop	6	40	16	229707 (T6; 0.45 Nm)
40/10	eShop	6	40	22	229707 (T6; 0.45 Nm)



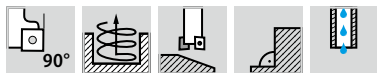
KYOCERA Indexable inserts BDMT 0703.. for indexable milling cutters No. 227100 – 227115

Note: Standard application values for $a_e = 0.3 \times D$. Exactly 90° up to $a_p = 4$ mm.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
PR1825				200	180	180	140	140						180	180					○	○	●	●
PR1835														160	160	50				○	○	●	●
PR1810																	180			○	○	●	●

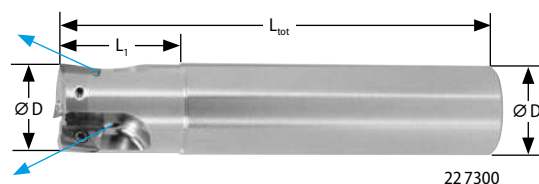


Type	ST1400	INOX	GG	
NEW 25A 22 7138 BDMT 070302 ER-JT PR1825	eShop	—	—	10
NEW 25A 22 7139 BDMT 070304 ER-JT PR1825	eShop	—	—	10
NEW 25A 22 7140 BDMT 070308 ER-JT PR1825	eShop	—	—	10
NEW 25A 22 7151 BDMT 070302 ER-JS PR1835	—	eShop	—	10
NEW 25A 22 7152 BDMT 070304 ER-JS PR1835	—	eShop	—	10
NEW 25A 22 7153 BDMT 070308 ER-JS PR1835	—	eShop	—	10
25A 22 7158 BDMT 070302 ER-JT PR1810	—	—	eShop	1
25A 22 7159 BDMT 070304 ER-JT PR1810	—	—	eShop	1
25A 22 7160 BDMT 070308 ER-JT PR1810	—	—	eShop	1
f_z	mm	0.07 – 0.11	0.05 – 0.08	0.09 – 0.16



KYOCERA 90° indexable milling cutter MEC11T for indexable inserts BD. T 11T3..

Description: MEC11T mill type with higher stability due to lower number of cutters than MECX. This enables higher feed rates per cutter.



22 7300



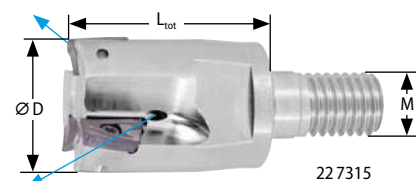
22 7305

Note:

22 7300 Size 16/2L – Without internal cooling.

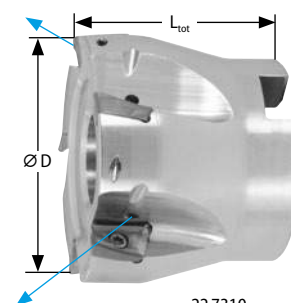
Ø D / number of teeth Z	250	22 7300	250	22 7305	maximum cutting depth a _{p max}	L ₁	L _{tot}		Ø D ₅ h6	Insert screw
	Indexable milling cutter 90° MEC11T						22 7300	22 7305		
	mm	Plain shank	Weldon shank	mm						
16/2		eShop		eShop	10	25	100	68	16	229708 (T8; 1.2 Nm)
16/2L		eShop		eShop	10	23	100	68	12	229708 (T8; 1.2 Nm)
18/2L		eShop		eShop	10	23	100	68	16	229708 (T8; 1.2 Nm)
20/2XL		eShop		—	10	30	170	—	18	229708 (T8; 1.2 Nm)
20/3		eShop		—	10	30	110	—	20	229708 (T8; 1.2 Nm)
20/3L		eShop		eShop	10	26	110	68	16	229708 (T8; 1.2 Nm)
22/2XL		eShop		—	10	30	170	—	20	229708 (T8; 1.2 Nm)
22/3L		eShop		—	10	26	110	—	20	229708 (T8; 1.2 Nm)
24/3L		eShop		—	10	29	120	—	20	229708 (T8; 1.2 Nm)
25/3		eShop		eShop	10	32	120	88	25	229708 (T8; 1.2 Nm)
25/3L		eShop		—	10	29	120	—	20	229708 (T8; 1.2 Nm)
30/4L		eShop		—	10	32	130	—	25	229708 (T8; 1.2 Nm)
32/4		eShop		—	10	40	130	—	32	229708 (T8; 1.2 Nm)
32/4L		eShop		—	10	32	130	—	25	229708 (T8; 1.2 Nm)
40/5L		eShop		—	10	50	150	—	32	229708 (T8; 1.2 Nm)
50/5L		eShop		—	10	50	150	—	32	229708 (T8; 1.2 Nm)

Ø D / number of teeth Z	250	22 7315	maximum cutting depth a _p	L _{tot}	Mounting thread M	Insert screw
	Indexable milling cutter 90° MEC11T		max			
mm	with threaded shank		mm	mm		
16/2	eShop		10	25	M8	229708 (T8; 1.2 Nm)
20/2	eShop		10	30	M10	229708 (T8; 1.2 Nm)
20/3	eShop		10	30	M10	229708 (T8; 1.2 Nm)
25/3	eShop		10	35	M12	229708 (T8; 1.2 Nm)
32/4	eShop		10	40	M16	229708 (T8; 1.2 Nm)

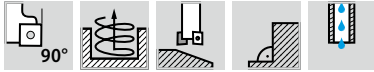


22 7315

Ø D / number of teeth Z	250	22 7310	maximum cutting depth a _p	L _{tot}	Mounting bore Ø	Insert screw
		Indexable milling cutter 90° MEC11T	max			
mm		with bore	mm	mm	mm	
40/5		eShop	10	40	16	229708 (T8; 1.2 Nm)
50/5		eShop	10	40	22	229708 (T8; 1.2 Nm)
63/6		eShop	10	40	22	229708 (T8; 1.2 Nm)
80/7		eShop	10	50	27	229708 (T8; 1.2 Nm)
100/9		eShop	10	55	32	229708 (T8; 1.2 Nm)
125/11		eShop	10	63	40	229708 (T8; 1.2 Nm)

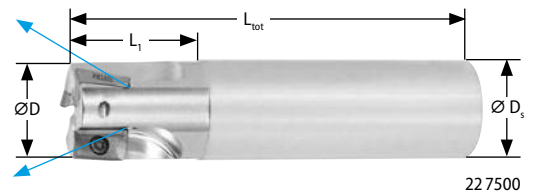


22 7310



KYOCERA 90° indexable milling cutter MEC17 for indexable inserts BD.T 1704..

Long cutting edges permit exceptionally large cutting depths.
Small number of cutting edges.



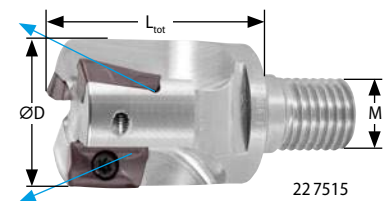
22 7500



22 7505

Ø D / number of teeth Z	250	22 7500	250	22 7505	maximum cutting depth $a_{p\max}$	L_1	L_{tot}		Ø D _s h6	Insert screw
	Indexable milling cutter 90° MEC17						22 7500	22 7505		
	mm	Plain shank	Weldon shank	mm						
25/2		eShop		eShop	15.7	36	120	92	25	229709 (T15; 3.5 Nm)
25/2L		eShop		—	15.7	36	120	—	20	229709 (T15; 3.5 Nm)
32/3		eShop		eShop	15.7	40	130	100	32	229709 (T15; 3.5 Nm)
32/3L		eShop		—	15.7	40	130	—	25	229709 (T15; 3.5 Nm)
40/4L		eShop		—	15.7	50	150	—	32	229709 (T15; 3.5 Nm)
50/4L		eShop		—	15.7	50	150	—	32	229709 (T15; 3.5 Nm)

Ø D / number of teeth Z	250	22 7515	maximum cutting depth $a_{p\max}$	L_{tot}	Mounting thread M	Insert screw
	Indexable milling cutter 90° MEC17					
mm	with threaded shank		mm	mm		
25/2	eShop		15.7	35	M12	229709 (T15; 3.5 Nm)
32/3	eShop		15.7	40	M16	229709 (T15; 3.5 Nm)

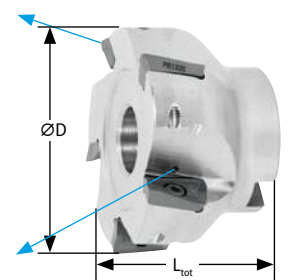


22 7515

Note:

Size 160/12 – Without internal cooling.

Ø D / number of teeth Z	250	22 7510	maximum cutting depth $a_{p\max}$	L_{tot}	Mounting bore Ø	Insert screw
	Indexable milling cutter 90° MEC17					
mm	with bore		mm	mm	mm	
40/4	eShop		15.7	40	16	229709 (T15; 3.5 Nm)
50/4	eShop		15.7	40	22	229709 (T15; 3.5 Nm)
63/5	eShop		15.7	40	22	229709 (T15; 3.5 Nm)
80/6	eShop		15.7	50	27	229709 (T15; 3.5 Nm)
100/7	(eShop)		15.7	55	32	229709 (T15; 3.5 Nm)
125/9	(eShop)		15.7	63	40	229709 (T15; 3.5 Nm)
160/12	(eShop)		15.7	63	40	229709 (T15; 3.5 Nm)



22 7510

KYOCERA Inserts BD.T 11T3.. for indexable milling cutters MEC11T No. 227300 – 227315 and inserts BD.T 1704..for indexable milling cutters No. 227500 – 227515

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
GW25	700	500	250																				
PR1825				200	180	180	140	140						180	180					○	○	●	●
PR1535														160	160	50				○	○	●	●
CA6535														240	220	30				○	○	●	●
PR1810																50	180			○	○	●	●

Milling inserts BD.T 11T3..

Note: Standard application values for $a_e = 0.3 \times D$.
Exactly 90° up to $a_p = 5.5$ mm.



Type			ALU	ST1400	INOX	S	GG	
25A 22 7325	BDGT 11T302 FR-JA	GW25	eShop	—	—	—	—	1
25A 22 7326	BDGT 11T304 FR-JA	GW25	eShop	—	—	—	—	1
25A 22 7327	BDGT 11T308 FR-JA	GW25	eShop	—	—	—	—	1
25A 22 7343	BDMT 11T302 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7344	BDMT 11T304 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7345	BDMT 11T308 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7346	BDMT 11T312 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7347	BDMT 11T316 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7348	BDMT 11T320 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7349	BDMT 11T324 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7351	BDMT 11T331 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7358	BDMT 11T302 ER-JS	PR1535	—	—	eShop	—	—	1
25A 22 7359	BDMT 11T304 ER-JS	PR1535	—	—	eShop	—	—	1
25A 22 7360	BDMT 11T308 ER-JS	PR1535	—	—	eShop	—	—	1
25A 22 7361	BDMT 11T302 ER-JS	CA6535	—	—	—	eShop	—	1
25A 22 7362	BDMT 11T304 ER-JS	CA6535	—	—	—	eShop	—	1
25A 22 7363	BDMT 11T308 ER-JS	CA6535	—	—	—	eShop	—	1
25A 22 7366	BDMT 11T308 ER-JT	PR1810	—	—	—	—	eShop	1
f_z		mm	0.05 – 0.33	0.07 – 0.11	0.07 – 0.11	0.06 – 0.1	0.09 – 0.16	

Milling inserts BD.T 1704..

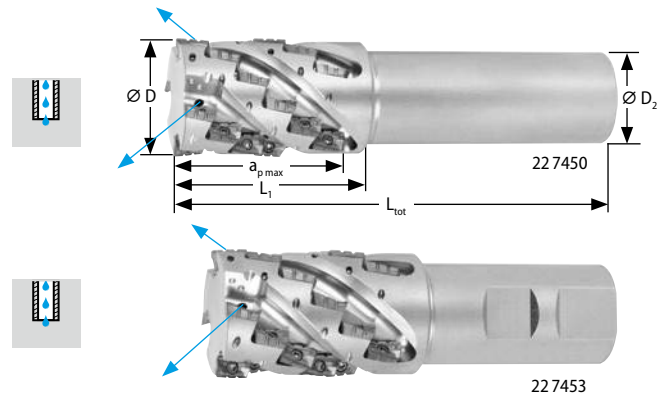
Note: Standard application values for $a_e = 0.3 \times D$.
Exactly 90° up to $a_p = 9$ mm.



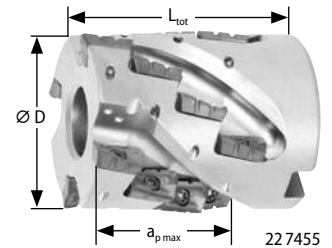
Type			ALU	ST1400	INOX	S	GG	
25A 22 7526	BDGT 170404 FR-JA	GW25	eShop	—	—	—	—	1
25A 22 7527	BDGT 170408 FR-JA	GW25	eShop	—	—	—	—	1
25A 22 7530	BDGT 170420 FR-JA	GW25	eShop	—	—	—	—	1
25A 22 7533	BDGT 170431 FR-JA	GW25	eShop	—	—	—	—	1
25A 22 7550	BDMT 170404 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7551	BDMT 170408 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7552	BDMT 170412 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7553	BDMT 170416 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7554	BDMT 170420 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7555	BDMT 170424 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7558	BDMT 170431 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7559	BDMT 170440 ER-JT	PR1825	—	eShop	—	—	—	1
25A 22 7560	BDMT 170404 ER-JS	PR1535	—	—	eShop	—	—	1
25A 22 7561	BDMT 170408 ER-JS	PR1535	—	—	eShop	—	—	1
25A 22 7564	BDMT 170404 ER-JS	CA6535	—	—	—	eShop	—	1
25A 22 7565	BDMT 170408 ER-JS	CA6535	—	—	—	eShop	—	1
25A 22 7568	BDMT 170408 ER-JT	PR1810	—	—	—	—	eShop	1
f_z		mm	0.05 – 0.33	0.09 – 0.22	0.09 – 0.13	0.07 – 0.13	0.09 – 0.27	



KYOCERA 90° indexable milling cutter MECH11 for indexable inserts BDMT 11T308



Ø D / Z _{eff}	250	22 7450	250	22 7453	Number of effective inserts Z _{eff}	Number of indexable inserts	maximum cutting depth a _{p max}	L ₁	L _{tot}	Ø D ₂ h ₆	Insert screw
		90° indexable milling cutter MECH11									
mm		Plain shank	Weldon shank				mm	mm	22 7450	22 7453	
25/2		eShop	eShop		2	8	37	46	120	104	229708 (T8; 1.2 Nm)
32/2		eShop	eShop		2	10	46	55	140	117	229708 (T8; 1.2 Nm)
32/4		eShop	eShop		4	20	46	55	140	117	229708 (T8; 1.2 Nm)
40/4		eShop	eShop		4	24	55	64	150	126	229708 (T8; 1.2 Nm)
50/4		—	eShop		4	28	64	75	—	147	229708 (T8; 1.2 Nm)



Ø D / Z _{eff}	250	22 7455	Number of effective inserts Z _{eff}	Number of indexable inserts	maximum cutting depth a _{p max}	L _{tot}	Mounting bore Ø	Insert screw
		90° indexable milling cutter MECH11						
mm		with bore			mm	mm	mm	
40/4		eShop	4	16	37	50	16	229708 (T8; 1.2 Nm)
50/6		eShop	6	30	46	63	22	229708 (T8; 1.2 Nm)

KYOCERA Indexable inserts BDMT 11T308 for indexable milling cutter No. 227450 – 227455

Note: The milling cutters are alternately equipped with equal numbers of indexable inserts shape N2 and N3. Please fit the inserts as marked on the body. Standard application values for a_e = 0.3×D.

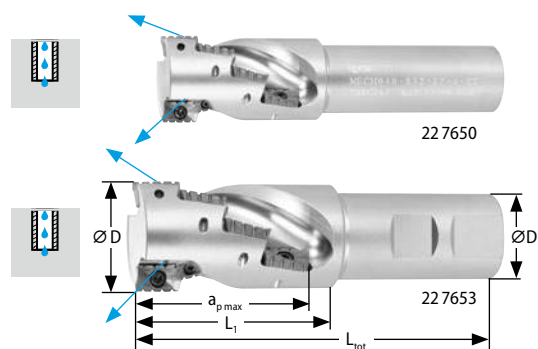
Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G) > 180 N	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
22 7472/7473				180	180	180	140	140												○	○	●	●
22 7482/7483																	180			○	○	●	●



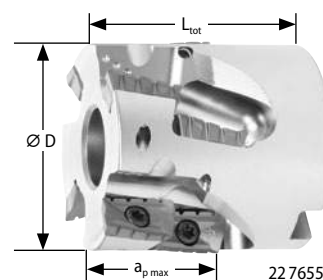
Type	ST1400	GG	
25A 22 7472 BDMT 11T308 ER-N2 PR1825	eShop	—	1
25A 22 7473 BDMT 11T308 ER-N3 PR1825	eShop	—	1
25A 22 7482 BDMT 11T308 ER-N2 PR1810	—	eShop	1
25A 22 7483 BDMT 11T308 ER-N3 PR1810	—	eShop	1
f _z mm	0.09 – 0.16	0.09 – 0.2	



KYOCERA 90° indexable milling cutter MECH17 for indexable inserts BDMT 170408



$\varnothing D / Z_{\text{eff}}$	250	22 7650	250	22 7653	Number of effective inserts Z_{eff}	Number of indexable inserts	maximum cutting depth $a_{p \text{ max}}$	L_1	L_{tot}	$\varnothing D_s$ h6	Insert screw
		90° indexable milling cutter MECH17									
mm		Plain shank		Weldon shank			mm	mm	mm	mm	
40/2		eShop		eShop	2	8	59	73	160	32	229709 (T15; 3.5 Nm)
50/4		—		eShop	4	20	74	88	—	161	229709 (T15; 3.5 Nm)



$\varnothing D / Z_{\text{eff}}$	250	22 7655	Number of effective inserts Z_{eff}	Number of indexable inserts	maximum cutting depth $a_{p \text{ max}}$	L_{tot}	Mounting bore $\varnothing$	Insert screw
		90° indexable milling cutter MECH17						
mm		with bore			mm	mm	mm	
50/4		eShop	4	8	30	52	22	229709 (T15; 3.5 Nm)
50/4L		eShop	4	16	59	78	22	229709 (T15; 3.5 Nm)
63/4		eShop	4	12	45	70	27	229709 (T15; 3.5 Nm)
80/6		eShop	6	24	59	85	32	229709 (T15; 3.5 Nm)
100/6		eShop	6	24	59	85	40	229709 (T15; 3.5 Nm)

KYOCERA Indexable inserts BDMT 170408 for indexable milling cutters No. 227650 – 227655

Note: The milling cutters are alternately equipped with equal numbers of indexable inserts shape N3 and N4. Please fit the inserts as marked on the body. Standard application values for $a_e = 0.3 \times D$.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	K	N					
22 7672/7673				180	180	180	140	140									180			○	○	●	●
22 7682/7683																				○	○	●	●



Type	ST1400		GG		
25A 22 7672	BDMT 170408 ER-N3	PR1825	eShop	—	1
25A 22 7673	BDMT 170408 ER-N4	PR1825	eShop	—	1
25A 22 7682	BDMT 170408 ER-N3	PR1810	—	eShop	1
25A 22 7683	BDMT 170408 ER-N4	PR1810	—	eShop	1
f_z	mm		0.09 – 0.16		0.09 – 0.2

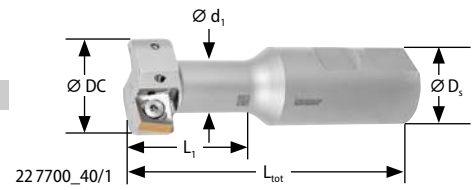


HELISLOT slot and side milling cutter for inserts XNMU130608 and XNMU090408

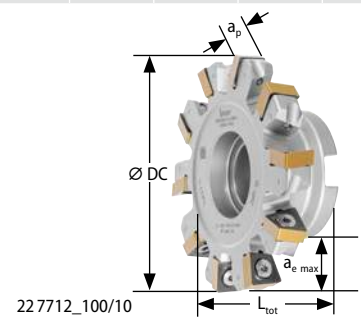
Economical machining of grooves and T-slots. Achieve different slot widths with only one insert size thanks to the insert seat concept with staggered teeth formation. Square inserts with positive rake angle for efficient and gentle machining. Very reliable process thanks to optimised insert support in the seat.

HELISLOT full slot milling cutter for XNMU130608

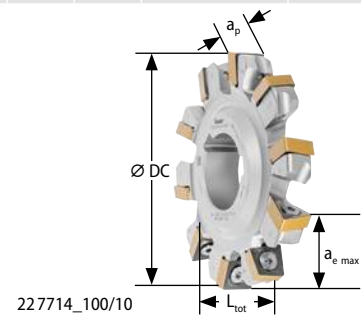
Spare part: Pack of insert screws No. **229697 1** (IP15; 4.8 Nm).



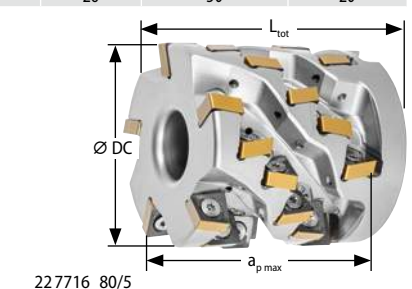
$\varnothing D_c / Z_{eff}$	19D 22 7700	Number of effective inserts Z_{eff}	Number of indexable inserts	Slot depth a_p	$\varnothing d_1$	L_1	L_{tot}	$\varnothing D_s$ h6
mm	HELISLOT T-slot milling cutter Weldon shank			mm	mm	mm	mm	mm
40/1	—	1	2	18	21	47	120	32
48/2	—	2	4	22	27	58	130	32



$\varnothing D_c / Z_{eff}$	19D 22 7712	Number of effective inserts Z_{eff}	Number of indexable inserts	$a_{e\ max}$	L_1	L_{tot}	Mounting bore $\varnothing$	Slot width a_p
mm	HELISLOT side milling cutter with flange			mm	mm	mm	mm	mm
100/10	—	10	10	26	26.5	40	27	14
125/12	—	12	12	33	30.5	45	32	14
125/6	—	6	12	33	30.5	45	32	16
160/7	—	7	14	45	44	60	40	18
200/8	—	8	16	53	—	63	40	20



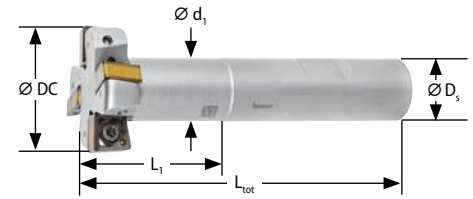
$\varnothing D_c / Z_{eff}$	19D 22 7714	Number of effective inserts Z_{eff}	Number of indexable inserts	$a_{e\ max}$	L_{tot}	Mounting bore $\varnothing$	Slot width a_p
mm	HELISLOT side milling cutter without flange			mm	mm	mm	mm
100/10	—	10	10	23	18	32	14
125/12	—	12	12	33	18	40	14
125/6	—	6	12	33	20	40	16
160/7	—	7	14	50.5	20	40	16
200/8	—	8	16	59	26	50	20



$\varnothing D_c / Z_{eff}$	19D 22 7716	Number of effective inserts Z_{eff}	Number of indexable inserts	maximum cutting depth $a_{p\ max}$	L_{tot}	Mounting bore $\varnothing$
mm	HELISLOT shoulder mill with bore			mm	mm	mm
63/3	—	3	18	69	80	27
80/5	—	5	30	69	85	32

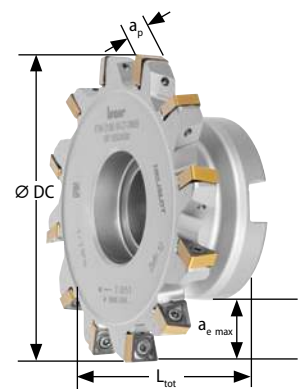


22

HELISLOT full slot milling cutter for XNMU090408**Spare part:** Pack of insert screws No. **229695 3** (TX9; 2.0 Nm).

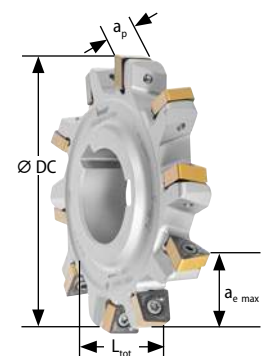
227718_31,7/16

$\varnothing D_c / \varnothing D_s h_6$	19D	22 7718	Number of effective inserts Z_{eff}	Number of indexable inserts	Slot depth a_p	$\varnothing d_1$	L_1	L_{tot}	$\varnothing D_s h_6$
mm		HELISLOT T-slot milling cutter Weldon shank			mm	mm	mm	mm	mm
31,7/16		—	2	4	9.9	15.5	35	85	16
31,7/20		—	2	4	10.8	16	41	95	20
31,7/25		—	2	4	10.8	16	41	105	25
31,7/25S		—	2	4	13.8	16	41	105	25
31,7/32		—	2	4	13.8	16	45	110	32



227720_100/6

$\varnothing D_c / Z_{eff}$	19D	22 7720	Number of effective inserts Z_{eff}	Number of indexable inserts	$a_{e\ max}$	L_1	L_{tot}	Mounting bore $\varnothing$	Slot width a_p
mm		HELISLOT side milling cutter with flange			mm	mm	mm	mm	mm
80/10		—	10	10	22.5	27	40	22	10
80/5		—	5	10	22.5	27	40	22	12
100/12		—	12	12	26	25	40	27	10
100/6		—	6	12	26	25	40	27	12
125/14		—	14	14	33	31	45	32	10
125/7		—	7	14	33	31	45	32	12
160/18		—	18	18	45	35	50	40	10
160/9		—	9	18	45	35	50	40	12



227722_80/5

$\varnothing D_c / Z_{eff}$	19D	22 7722	Number of effective inserts Z_{eff}	Number of indexable inserts	$a_{e\ max}$	L_{tot}	Mounting bore $\varnothing$	Slot width a_p
mm		HELISLOT side milling cutter without flange			mm	mm	mm	mm
80/10		—	10	10	20	14	27	10
80/5		—	5	10	20	16	27	12
100/12		—	12	12	25	14	32	10
100/6		—	6	12	25	16	32	12
125/14		—	14	14	34	14	40	10
125/7		—	7	14	34	16	40	12
160/18		—	18	18	51	14	40	10
160/9		—	9	18	51	16	40	12



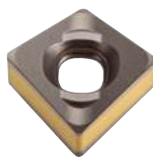
HELISLOT milling inserts XNMU130608 and XNMU090408 for slot and side milling cutters

Double-sided indexable insert with 8 helical cutting edges. Very robust design, special insert thickness. Very reliable process due to positive installation position in the insert seat. Excellent chip control and evacuation.

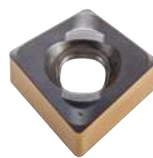
Note: Standard application values for a_e max
The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.

Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si										INOX	INOX	Ti	GG	GGG	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	K	K					
22 7739				200	180	160	150	140												●			
22 7741/7782				300	260	220	200	170												○			●
22 7742				220	200	170	160	140												●			●
22 7743																				●			●
22 7744										50	50	45	45	130	100					●			●
22 7745																45				○			●
22 7746																	340 300	260 240		●			●
22 7747				240	210	190	180						90	80					●	●			●
22 7783													130	100	50					●			
22 7784				240	210	190	180						90	80					●	●			

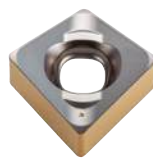
HELISLOT milling inserts XNMU130608



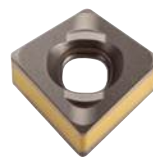
22 7739



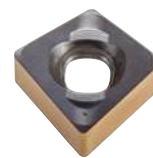
22 7742



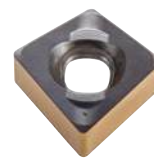
22 7744



22 7745



22 7746



22 7747

Type			ST900	ST1400	INOX	S	GG	GGG	UNI	
19A 22 7739	XNMU 130608PNN-PL	IC845	—	—	—	—	—	—	—	10
19A 22 7741		IC5400	—	—	—	—	—	—	—	10
19A 22 7742	XNMU 130608PNN-MM	IC830	—	—	—	—	—	—	—	10
19A 22 7743		IC330	—	—	—	—	—	—	—	10
19A 22 7744		IC380	—	—	—	—	—	—	—	10
19A 22 7745	XNMU 130608PNTN	IC5100	—	—	—	—	—	—	—	10
19A 22 7746		IC810	—	—	—	—	—	—	—	10
19A 22 7747	XNMU 130608PNN-MM	IC808	—	—	—	—	—	—	—	10
f_z		mm	0.15	0.1	0.1	0.15	0.15	0.15	—	

HELISLOT milling inserts XNMU090408



22 7782



22 7783



22 7784

Type			ST900	INOX	UNI	
19A 22 7782	XNMU 090408-PNTN	IC5400	—	—	—	10
19A 22 7783		IC830	—	—	—	10
19A 22 7784		IC808	—	—	—	10
f_z		mm	0.15	0.1	—	



New products – Machining – turning

NEW

We use this symbol to tag new items
in our range of catalogue products



Page **727 / 736 / 754**
HOLEX Pro lever lock toolholders, expansion of the range



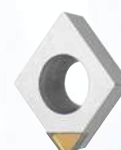
Pages **730 – 806**
GARANT HB7010-2 / HB7020-2 / HB7035-2



Pages **731 – 757**
KYOCERA PR115S



Page **769**
HOLEX carbide boring bars set



Page **817**
GARANT MCD chipbreaker NU



Pages **808 – 809**
GARANT Master Mute mono boring bars



Page **810**
GARANT Master Mute
HSK-T / PSC shank mountings



Page **811**
GARANT Master Mute boring bar shanks



Pages **811 – 812**
GARANT Master Mute
exchangeable cutting heads for
negative indexable inserts



Pages **812 – 813**
GARANT Master Mute
exchangeable cutting heads for
positive indexable inserts



Page **814**
GARANT Master Mute
exchangeable cutting heads
for diamond burnishing



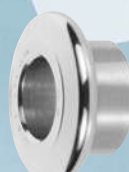
Page **844**
GARANT threading inserts type BF



Page **855**
HOLEX threading inserts



Page **903 / 906 / 907**
ZEUS knurl forming tools / cut knurling tools,
for sliding headstock lathes (Swiss type lathes)



Page **909**
ZEUS burnishing rollers



Page **909**
ZEUS holder for burnishing roller

Machining – Turning

ECOROLL

ISEN

KYOCERA

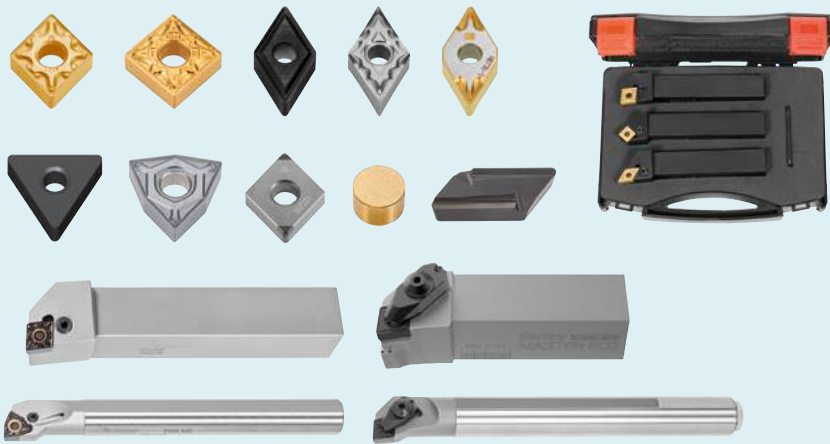
SIMIEK

HOLEX

The whole catalogue range of these brands
is available from the Hoffmann Group – just request it!



25



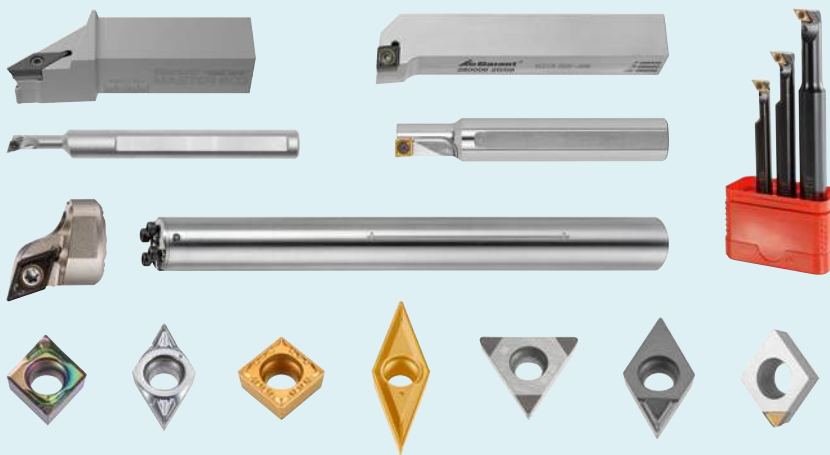
Garant

ISEN

KYOCERA

HOLEX

Negative rake inserts
(carbide, CBN,
ceramic),
toolholders,
boring bars

712 –
763

Garant

ISEN

KYOCERA

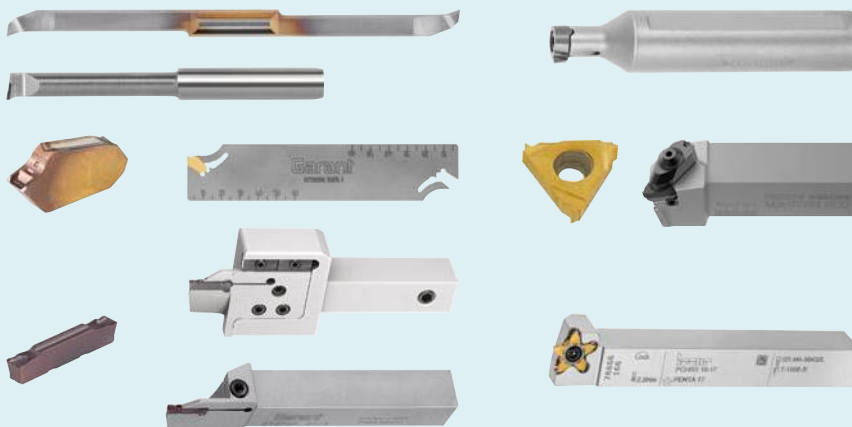
KENNAMETAL

SWISS TOOLS

HOLEX

Positive
inserts
(carbide, CBN, MCD,
PCD),
toolholders,
boring bars,
vibration-damping
tools, interchangeable
cutting heads,
precision turning
range,
turning and drilling
tools

26

764 –
827

Garant

ISEN

SIMIEK

HOLEX

Mini turning tools,
micro turning tools,
thread turning tools,
groove turning tools
for retaining rings,
parting off and
grooving tools,
axial face grooving
tools

27

828 –
902

Garant

ZSL

ECOROLL

duMONT

HOLEX

Knurling tools,
smooth rolling tools,
labelling tools, keyway
broaching tools and
profile slotting tools,
broaches,
profile broaching
tools, radial turning
tools, turning tool
blanks,
turning tools

29

903 –
931

Garant

HOLEX

Turning type key



HB 7130-2					
H	B	7	1	30	2
Technology	Coating	Classification	Application range of materials	Application conditions	Version
C Cermet	B Coated	7 GARANT	0 P	05	
H Tungsten carbide	U Uncoated	8 GARANT	1 M	10	
P PCD		9 GARANT	2 O	15	
M MCD		Z GARANT	3 N	20	
B CBN		G HOLEX	4 S	25	
O Ceramic		X HOLEX	2 H	30	
		T HOLEX	.. UNI	35	
				40	

Tool materials for turning



ISO turning

Garant

Cermet

Cermet grade for precision finishing and finishing of steel, stainless steel and cast iron. Uncoated.

P (Steel)					M (Inox)				K GG(G)				N (Alu)				S (Ti)				H (HRC)		
P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	N30	S01	S10	S20	S30	H10	H20	H30
CU7010					CU7010				CU7010														
CB7010					CB7010				CB7010														
HB725-1					HB725-1				HB725-1				HB725-1				HB725-1						
HB730-1					HB730-1				HB730-1				HB730-1				HB730-1						
HB7010-2																							
HB7020-2																							
HB7035-2																							
HB7120-1																							
HB7130-2																							
HB7140-2																							
HB7210-1																							
													HU7305-1										
													HU7310										
													HU7310-1										
													HB7310										
													HU7315-1										
													HB7315-1										
					HB7415-1												HB7415-1						

Tool materials for turning



ISO turning

Garant

	P (Steel)					M (Inox)				K GG(G)				N (Alu)				S (Ti)				H (HRC)		
	P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	N30	S01	S10	S20	S30	H10	H20	H30
PCD																								
Polycrystalline diamond, fine grain. Very good cutter sharpness, wear resistance and toughness.																		PCD	PCD					
MCD																								
Monocrystalline diamond. Extremely sharp cutting edges and extremely high contour accuracy. Low tendency to brittle fracture.																		MCD	MCD					
CBN																								
General-purpose CBN grade for hardened materials. Excellent toughness properties.																							BU7220	
Ceramic																								
Aluminium oxide silicon carbide whisker ceramic. Grade for general machining of heat-resistant alloys. Uncoated.																				KU7415				
Coated aluminium oxide titanium carbide ceramic. Grade for general machining of hardened materials and grey cast iron. Coated.										KB7205													KB7205	



Tungsten carbide

	P (Steel)					M (Inox)				K GG(G)				N (Alu)				S (Ti)				H (HRC)		
	P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	N30	S01	S10	S20	S30	H10	H20	H30
General-purpose tool material grade. Particularly good for general machining of steel and stainless steel. Substrate with submicron grain size. PVD coating.						IC807	IC807			IC807										IC807		IC807		
Grade for continuous cutting conditions in steel machining. High speed machining. Hard substrate with a cobalt-enriched layer. CVD coating.						IC8150	IC8150			IC8150														
Grade for general machining of steel. Hard substrate with a cobalt-enriched layer. CVD coating.						IC8250	IC8250																	
Grade for continuous cutting conditions in stainless steel machining. Hard substrate with a cobalt-enriched layer. CVD coating.							IC6015													IC6015				
Grade for slightly interrupted cutting conditions in stainless steel machining. High flexibility. CVD coating.							IC6025													IC6025				



Cermet

	P (Steel)					M (Inox)				K GG(G)				N (Alu)				S (Ti)				H (HRC)		
	P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	N30	S01	S10	S20	S30	H10	H20	H30
Cermet grade for continuous cutting conditions in steel and cast iron machining. High speed machining. CVD coating.						CCX				CCX														
Cermet grade for general machining of steel and stainless steel. PVD coating.						PV720	PV720																	
Tungsten carbide																								
Grade for continuous cutting conditions in steel machining. Optimised heat and wear resistance. High speed machining. TiCN + Al ₂ O ₃ + TiN (CVD coating).						CA510																		
Grade for continuous and slightly interrupted cutting conditions in steel machining. Optimised heat and wear resistance. TiCN + Al ₂ O ₃ (CVD coating).						CA115P																		
Grade for continuous and strongly interrupted cutting conditions in steel machining. High flexibility. TiCN + Al ₂ O ₃ (CVD coating).						CA125P																		
Grade for general machining of stainless steel. PVD coating.						PR1725	PR1725																	
Grade for general machining of stainless steel. TiCN + Al ₂ O ₃ + TiN (CVD coating).							CA6525																	
Grade for general machining of stainless steel, heat-resistant alloys and titanium alloys. PVD coating.							PR1535													PR1535				
Grade for continuous and slightly interrupted cutting conditions in cast iron machining. TiCN + Al ₂ O ₃ (CVD coating).										CA315														
Grade for continuous cutting conditions in aluminium and cast iron machining. Tough, fine-grain substrate. Uncoated.																				KW10				
Grade for continuous cutting conditions in aluminium machining. Excellent surface quality due to reduced galling. DLC coating.																				PDL010				
Grade for general machining of heat-resistant alloys. TiAlN + AlTiCrN (PVD coating).																					PR1155			
Grade for continuous cutting conditions when machining titanium alloys. Uncoated.																				SW05				



Grooving and parting off

Garant

Cermet

Cermet grade for general machining of steel.
Good cutting edge stability. Uncoated.

CU7025

Tungsten carbide

General-purpose tool material grade for grooving and groove turning.
PVD coating.

HB7010

HB7010

HB7010

HB7010

General-purpose tool material grade.
TiN + Al₂O₃ + TiCN (PVD coating).

HB7020

HB7020

HB7020

HB7020

Grade for grooving and groove turning for steel and cast iron.
TiN + Al₂O₃ + TiCN (CVD coating).

HB7035

HB7035

Grade for grooving and groove turning for steel and cast iron.
TiN + Al₂O₃ + TiCN (CVD coating).

HB7215

HB7215

Grade for grooving and groove turning in steel.
TiCN (PVD coating).

HB9035

Grade for groove turning and grooving in steel and stainless steel.
High wear resistance and long working life.

HB9635

Grade for groove turning and grooving in stainless steel.
Outstanding wear resistance. PVD coating.

HB9140

Grade for grooving and groove turning in cast materials.
Outstanding cutting edge stability. Uncoated.

HU915

Grade for grooving and groove turning for aluminium materials.
Outstanding wear resistance and cutting edge stability.
Uncoated.

HU7310

Grade for grooving and groove turning for aluminium materials.
Outstanding cutting edge stability. Uncoated.

HU9310

Grade for grooving and groove turning for aluminium materials.
Tough, fine-grain substrate. Uncoated.

HU9315

HU9315

HOLEX

Tungsten carbide

Grade for general machining
of steel and stainless steel.

HBX25

HBX25

Grade for general machining
of steel and stainless steel.

HBG25

HBG25

Groove turning

Garant

Cermet

Cermet grade for general machining of steel.
Good cutting edge stability. Uncoated.

CU7025

Tungsten carbide

Grade for general machining of steel.
Extremely high wear resistance. PVD coating.

HB7010

General-purpose tool material grade.
TiAlN (PVD coating).

HB7020

Grade for general machining of steel and cast iron.
Al₂O₃ + TiCN + TiN (CVD coating).

HB7215

Grade for general machining of aluminium.
Outstanding wear resistance and cutting edge stability.
Uncoated.

HU7310

Grade for general machining of aluminium, non-ferrous metals and
cast aluminium. CVD-diamond coating.

HU7310

PCD

Polycrystalline diamond, fine grain.
Very good cutter sharpness, wear resistance and toughness.

PCD

CBN

General-purpose CBN grade for hardened materials.
Excellent toughness properties.

CBN825



Tool materials for turning



Groove machining



	P (Steel)					M (Inox)				K GG(G)				N (Alu)				S (Ti)				H (HRC)		
	P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	N30	S01	S10	S20	S30	H10	H20	H30
Tungsten carbide																								
General-purpose tool material grade. Substrate with increased wear resistance. TiAlN + TiN (PVD coating).																								
Grade for interrupted and unstable cutting conditions. Substrate with increased toughness. TiAlN + TiN (PVD coating).																								
Grade for stable and unstable cutting conditions. Substrate with increased toughness. CVD coating.																								
General-purpose tool material grade. Substrate with increased wear resistance. TiAlN + AlTiN + TiN (PVD coating).																								
Grade for interrupted and unstable cutting conditions. Substrate with increased toughness. AlTiN + TiN (PVD coating).																								
Grade for stable and unstable cutting conditions. Substrate with increased toughness. CVD coating.																								
General-purpose tool material grade. Substrate with increased toughness. TiAlN + TiN (PVD coating).																								
General-purpose tool material grade. Substrate with increased wear resistance. TiAlN (PVD coating).																								

Thread machining

Garant

	P (Steel)					M (Inox)				K GG(G)				N (Alu)				S (Ti)				H (HRC)		
	P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	N30	S01	S10	S20	S30	H10	H20	H30
Tungsten carbide																								
Grade for continuous cutting conditions. TiAlN + Al ₂ O ₃ + TiCN (coating).																								
Grade for continuous cutting conditions. Multi-purpose micro-grain substrate. AlTiN (PVD coating).																								
General-purpose tool material grade. Optimised edge toughness and wear resistance.																								
Grade for general machining of stainless steel. TiAlN (PVD coating).																								
Grade for general machining of aluminium. Mirror finish polished for good chip evacuation and high-quality surfaces. Uncoated.																								

HOLEX

	P (Steel)					M (Inox)				K GG(G)				N (Alu)				S (Ti)				H (HRC)		
	P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	N30	S01	S10	S20	S30	H10	H20	H30
Tungsten carbide																								
Grade for general machining of steel and stainless steel.																								

"4-in-1" drilling and turning tool

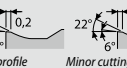
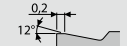
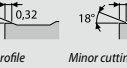
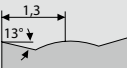
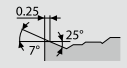
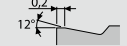
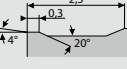
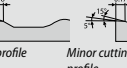
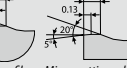
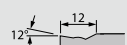
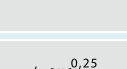
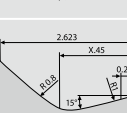
Garant

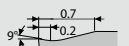
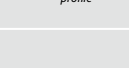
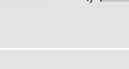
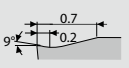
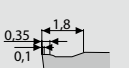
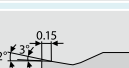
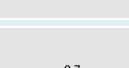
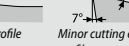
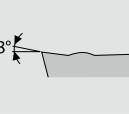
	P (Steel)					M (Inox)				K GG(G)				N (Alu)				S (Ti)				H (HRC)		
	P01	P10	P20	P30	P40	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	N30	S01	S10	S20	S30	H10	H20	H30
Tungsten carbide																								
General-purpose tool material grade. First choice for low-alloyed steel. PVD coating.																								
General-purpose tool material grade. First choice for low-alloyed steel. PVD coating.																								
Grade for general machining of steel. Specially for external and internal machining. CVD coating.																								
Grade for general machining of stainless steel. Fine-grain substrate. PVD coating.																								
Grade for general machining of stainless steel. Tough medium-grain substrate. PVD coating.																								
Grade for general machining of aluminium. Outstanding wear resistance and cutting edge stability. Uncoated.																								
Grade for general machining of aluminium. Outstanding wear resistance and cutting edge stability. PVD coating.																								

Garant

Chip breaker selection – ISO indexable turning inserts



Negative			
Application	Chip breaker	Geometry	Characteristics
P	Finishing	WSS	 Wiper geometry for finishing of general and alloy steels. Higher feed rates with the same surface quality.
		SS	 Specially for finishing of general and alloy steels. For high feed rates at low cutting depths.
	Medium	WSM	 Wiper geometry for medium machining of general and alloy steels. Higher feed rates with the same surface quality.
		SM	 Medium machining of general and alloy steel grades. Positive primary chamfer for smooth cutting.
		SM spec. KNUX	 Machining of carbon steel and alloy steels.
	Roughing	SG	 Roughing operations on general and alloy steels. Large flute combined with a wide, flat primary chamfer for high feed rates.
	Coarse machining	SR	 Rough machining of low-tensile steels. The positive primary chamfer and curved cutting edge reduce the cutting resistance.
M	Finishing	VS	 Light to medium machining of stainless steels. Also for difficult to machine materials. Sharp cutting edges for a soft cutting action.
	Medium	VM	 Distinctive chip evacuation geometry coupled with slightly positive cutting angle give the best chip evacuation. Main application in stainless steels.
		VM spec. KNUX	 Machining of stainless steels.
	Roughing	VG	 For rough machining of stainless steels. Sturdy cutting edge version.
O	Medium	GM	 High cutting edge stability for a wide range of applications in cast materials.
	Roughing	Cast iron	 Stable cutting edge and wide protective chamfer for medium rough machining of castings.
N	Medium	AM1	 For finishing to medium roughing of aluminium. Positive chip-breaker geometry.
S	Finishing	TIS	 Finish machining of difficult-to-machine materials such as nickel-based alloys or titanium.
	Medium	TIM	 Medium machining of heat-resistant alloys. Positive cutting angle and large flute permit targeted chip evacuation.
UN	Medium	UM1	 Chip breakers for medium machining. For general use over a wide range of materials.
		XUM	 Open and positive chip breaker for soft cutting and optimum chip formation.

Positive			
Application	Chip breaker	Geometry	Characteristics
P	Fine finishing	SF	 For precision finishing in steels. Positive rake geometry for soft cutting.
		WSS	 Wiper geometry for finishing of steels and stainless steels. Higher feed rates with the same surface quality.
	Finishing	SS	 Finishing operations on general, alloy and stainless steels. Smooth cut due to sharp cutting edge profile.
		WSM	 Wiper geometry for medium machining of general and alloy steels. Higher feed rates with the same surface quality.
	Medium	SM	 First choice for medium machining of carbon steel, alloy and stainless steels. Combination of sharp cutting edges and stability.
		VF	 For precision finishing in stainless steels. Positively designed geometry for soft cutting.
	Finishing	VS	 For light and medium operations in stainless steels. Heavily profiled surface for unobstructed swarf evacuation. Sharp cutting edges.
M	Medium	VM	 For medium and pre-machining of stainless steels. Strong cutting edges and positive rake angle.
O	Medium	GM	 High cutting edge stability for a wide range of applications in cast materials.
N	Fine finishing	AF	 Positive rake geometry specially for non-ferrous metals and plastics.
		AF	 Positive rake geometry specially for non-ferrous metals and plastics.
	Medium	AM	 Aluminium machining. Large rake angle and special surface geometry permit excellent chip clearance and low cutting forces.
S	Finishing	TIS	 Exceptionally well suited for use on high temperature materials.
UN	Medium	UM1	 Chip breakers for medium machining. Universally applicable in a wide range of materials.
		XUM	 Open and positive chip breaker for soft cutting and optimum chip formation.



KYOCERA Chip breaker selection – ISO indexable turning inserts



Negative				Positive					
Application	Chip breaker	Geometry	Characteristics	Application	Chip breaker	Geometry	Characteristics		
P	Finishing	WP		Finishing with wiper geometry. For twice the feed rate without compromising the surface quality.	P	Fine finishing	MP-CF		Suitable for small cutting depths (0.02 mm – 0.2 mm).
		WQ		Wiper geometry for finish machining with double the feed rate without affecting the surface quality.		Finishing	WP		Finishing with wiper geometry. For good chip clearance at high feed rates. Reduces the surface wear rate.
		PP		Stable chip control in a wide feed range thanks to 3-stage point structure. Low cutting force.			MFP-SKS		Stable chip clearance thanks to base and chip breaker surfaces. For finishing from 0.2 mm – 1.5 mm.
	Finishing – Medium	PQ		For finishing up to light cuts. Good chip clearance.			PP		Stable tool life due to special cutting edge design with improved strength.
		HQ		Wide chip clearance area due to 3D rake angle and double overhang geometry.		Finishing – Medium	HQ		Chip breaker for medium machining.
	Medium	PS		Extremely stable due to large contact area.	M		Fine finishing	MFP-PF	
		PG		Chip breaker with stable edges for general machining.		Finishing	MFP-SKS		Stable chip clearance thanks to base and chip breaker surfaces. For finishing from 0.2 mm – 1.5 mm.
		PMG		For medium machining (wide range of applications). The chip evacuation prevents crater wear and promotes a long tool life.			MQ		Good chip evacuation when used for internal turning. The swarf is small and tightly rolled so it does not lodge in the toolholder.
	Roughing	PH		For roughing steels. Suitable for heavily interrupted cutting and workpieces with casting skin.	K	Finishing – Medium	GK		Good chip clearance due to chip breaker and chip diverter.
	Coarse machining	PX		Roughing at high feed rates. The chip breaker requires only low cutting force.	N	Finishing	AP		Good chip clearance. Sharp cutting edge for excellent surface quality. Chip breaker polished.
M	Finishing	MQ		Large rake angle, round cutting edge design. Low cutting force and good chip clearance.		Finishing – Medium	AH		Sharp cut and good chip clearance with low cutting force. Low tendency to edge build-up due to polished rake faces.
	Medium	MS		First-class sharp cutting edges due to positive rake geometry. Particularly stable cutting edge.	S		Finishing	MQ	
K	Medium	KG		Chip breaker with positive chisel edge for smooth to interrupted cutting.					
N	Medium	AH		Polished chip breaker. Very good chip clearance and low tendency to edge build-up.					
S	Finishing	MQ		Large rake angle, round cutting edge design. Low cutting force and good chip clearance.					
	Medium	MU		Large rake angle reduces the cutting forces. Low burr formation due to reduced damage due to formation of notches.					
	Coarse machining	SX		Highly efficient roughing thanks to unique cutting edge design. Shim insert necessary!					

Garant

HOLEX

Selection of chip breakers, ISO indexable turning inserts

Member HMC Group
ISCAR

Negative			
Application	Chip breaker	Geometry	Characteristics
P	Finishing	F3P	Double-sided indexable insert with positive rake angle to reduce cutting forces when finishing steel.
	Medium	M3P	Double-sided indexable insert for medium machining of steel with reinforced cutting edge to increase tool life.
M	Finishing	F3M	Double-sided indexable insert with positive rake angle for finishing stainless steel. The unique insert geometry with a wavy surface prevents chipping.
	Medium	M3M	Double-sided indexable insert for medium machining of stainless steel with reinforced cutting edge to increase tool life.

Positive			
Application	Chip breaker	Geometry	Characteristics
P	Finishing	F3P	Chip breaker with positive rake angle for fine and finish machining of steel.
	Medium	M3P	Chip breaker with reinforced cutting edge and positive rake angle for medium machining of steel.
M	Finishing	F3M	Chip breaker with positive rake angle for finish machining stainless steels, also suitable for superalloys and exotic materials.
	Medium	M3M	Chip breaker with reinforced cutting edge and positive rake angle for medium machining of stainless steel.

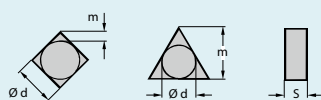
HOLEX

Negative			
Application	Chip breaker	Geometry	Characteristics
P	Finishing	PF	Soft-cutting geometry for finish machining of steels.
	Medium	PM	Reliable chip clearance for medium machining of steels.
	Roughing	PR	Stable cutting edge version for roughing machining of steels.
M	Finishing	MF	Soft-cutting geometry for finish machining of stainless steels.
	Medium	MM	Reliable chip clearance for medium machining of stainless steels.
	Roughing	MR	Stable cutting edge version for roughing machining of stainless steels.

Positive			
Application	Chip breaker	Geometry	Characteristics
P	Finishing	PF	Soft-cutting geometry for finish machining of steels.
	Medium	PM	Reliable chip clearance for medium machining of steels.
M	Finishing	MF	Soft-cutting geometry for finish machining of stainless steels.
	Medium	MM	Reliable chip clearance for medium machining of stainless steels.



ISO code / factory standard, indexable turning inserts



Form, indexable insert		
C	Rhombus 80°	
D	Rhombus 55°	
G	Rhombus 45°	
K	Rhomboid 55°	
R	Round	
S	Square 90°	
T	Triangle 60°	
V	Rhombus 35°	
W	Trigon 80°	
X/Z	Special shape	

Main clearance angle	
A	3°
B	5°
C	7°
D	15°
G	30°
N	0°
P	11°
O	further clearance angles

Tolerance* (factory standard)			
	Tolerance with radius m mm	Tolerance in circle Ø d mm	Thickness tolerance S mm
A	± 0.005	± 0.025	± 0.025
C	± 0.013	± 0.025	± 0.025
E	± 0.025	± 0.025	± 0.025
F	± 0.005	± 0.013	± 0.025
G	± 0.025	± 0.025	± 0.13
H	± 0.013	± 0.013	± 0.025
J	± 0.005	± 0.05 up to ± 0.15	± 0.025
K	± 0.013	± 0.05 up to ± 0.15	± 0.025
L	± 0.025	± 0.05 up to ± 0.15	± 0.025
M	± 0.08 up to ± 0.20	± 0.05 up to ± 0.15	± 0.13
N	± 0.08 up to ± 0.20	± 0.05 up to ± 0.15	± 0.025
P*	± 0.04	± 0.04	± 0.04
U	± 0.13 up to ± 0.38	± 0.08 up to ± 0.25	± 0.13

Fastening and chip breaker			
	Hole configuration	Chip breaker	Insert type
A	Cylindrical hole	none	
B	Cylindrical hole + Countersink (70 ≈ 90°)	none	
C			
F	-	double-sided	
G	Cylindrical hole	double-sided	
H	Cylindrical hole + Countersink (70 ≈ 90°)	single-sided	
J		double-sided	
M	Cylindrical hole	single-sided	
N	-	none	
Q	Cylindrical hole + Countersink (40 ≈ 60°)	none	
R	-	single-sided	
T	Cylindrical hole + Countersink (40 ≈ 60°)	single-sided	
U		double-sided	
W		none	
X	-	-	Special design

C

N

M

G

12

04

08

P

F

N

Inner circle Ø for insert size									
Inner circle (mm)	C	D	G	K	R	S	T	V	W
3.970	03					03	06		02
4.100	S4								
4.920			55						
5.000					05				03
5.560	05						09		
6.000					06				
6.350	06	07				06	11	11	04
7.000					07				
7.940	08	09				07	13		05
8.000					08	08			
8.200							14		
9.525	09	11		16		09	16	16	06
10.000					10				
11.000						11			
12.000					12				07
12.700	12	15				12	22	22	08
14.290									09
15.875	16	19				15	27		10
16.000					16				
19.050	19	23				19	33		
20.000					20				
21.000									13
22.225	22	27				22	38		
25.000					25				
25.400	25	31				25	44		
26.194									17
31.750	32	38				31	55		
32.000					32				

Thickness	
mm	
S4	1.16
01	1.59
T1	1.98
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35

Corner radius	
mm	
00	without
01	0.1
02	0.2
03	0.3
04	0.4
05	0.5
06	0.6
08	0.8
10	1.0
12	1.2
15	1.5
16	1.6
20	2.0
24	2.4

Adjustment angle	
A	45°
D	60°
E	75°
F	85°
M O	Round
P	90°
Z	special

Cutting edge version	
F	sharp-edged
E	honed
T	chamfered
S	chamfered and honed

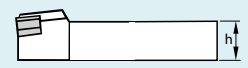
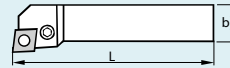
Direction of machining	
R	right-hand
L	left-hand
N	neutral

ISO code / factory standard toolholder



Toolholder for external turning

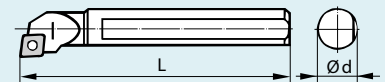
Standards: DIN ISO 5610 / *factory standard



P	C	L	N	R	25	25	M	16	
Clamping system	Form, indexable insert	Tool type	Clearance angle, indexable insert	Direction of machining	Shank		Tool length L	Cutting length	
					Height mm	Width mm	mm	mm	
C		A 90°	B 5°	R	08	08	D 60	C 	
D		B 75°	C 7°		10	10	E 70	D 	
M*		D 45°	D* 15°		12	12	F 80	G 	
P		E* 60°	E* 20°		16	16	H 100	K 	
S		F 90°	F* 25°	L	20	20	K 125	K 	
		G 90°	N 0°		25	25	M 150	R 	
		H 107.5°	P 11°		32	32	N* 160	S 	
		J 93°			40	40	P 170	T 	
		K 75°		N	50	50	R 200	V 	
		L 95°					S 250	W 	
		M* 30°					T* 300		
		N 63°					U* 350		
		P* 62.5°				X Special length			
		Q* 15°							
		R 75°							
		S 45°							
		T 60°							
		U* 93°							
		V 72.5°							
		χ* Special versions							

Toolholder for internal turning (boring bars)

Standards: DIN 8024 / DIN 8025-1 / ISO 5609-1 / *Manufacturer's standard



A		16		M		S		C		L		C		R		09	
Shank type		Ø d		Tool length L		Clamping system		Form, indexable insert		Adjustment angle		Clearance angle, indexable insert		Direction of machining		Cutting length	
			mm		mm												mm
A	Steel shank with through coolant supply	04	4	F	80	D*		C		F		B		R		C	
		05	5	G	90			D		J*			D				
AH*	HSS shank with through coolant supply	06	6	H	100	M		G*		K		C		L		G	
		08	8	J	110					L		D				K	
C	Carbide shank	10	10	K	125	P		K		O*		E				R	
		12	12	L*	140			P		F		S					
		16	16	M	150			R		N		T					
E	Carbide shank with through coolant supply	20	20	Q	180	S		S		U		P				V	
		25	25	R	200			T		V*						W	
S	Steel shank	32	32	S	250			V		X*							
		40	40	T	300			U		Z*							
		40	40	U	350			W		95*							
		50	50	X	Special length												



Toolholder



Toolholder for external machining								
ISO code toolholder	DCLNR/L	MCLNR/L	PCBNR/L	PCKNR/L	PCLNR/L	PCSNR/L	DDJNR/L	
Article number	25 0002 – 25 0039	25 0006 – 25 0007	25 0020 – 25 0021	25 0022 – 25 0023	25 0000 – 25 0045	25 0024 – 25 0025	25 0608 – 25 0631	
Shank size square mm	20 – 32	20 – 32	16 – 32	16 – 32	16 – 32	16 – 32	20 – 32	
Approach angle Degrees	95	95	75	75	95	45	93	
Variants with internal cooling	●	–	–	–	●	–	●	
Toolholder page	726 – 727	727	728	728	726 – 728	729	735 – 736	
suitable indexable insert								
Indexable insert Carbide / ceramic								
ISO code	CNMA / CNMG / CNMM	CNMA / CNMG / CNMM	CNMA / CNMG / CNMM	CNMA / CNMG / CNMM	CNMA / CNMG / CNMM	CNMA / CNMG / CNMM	DNMG	
Article number	25 0058 – 25 0498	25 0058 – 25 0498	25 0050 – 25 0498	25 0050 – 25 0498	25 0050 – 25 0504	25 0050 – 25 0498	25 0652 – 25 0787	
Insert size	12 / 16	12 / 16	09 / 12 / 16	09 / 12 / 16	09 / 12 / 16 / 19	09 / 12 / 16	11 / 15	
Indexable insert page	730 – 734	730 – 734	730 – 734	730 – 734	730 – 734	730 – 734	737 – 740	

Toolholder



Toolholder for external machining								
ISO code toolholder	PSSNR/L	MTJNR/L	MVJNR/L	MVPNRL	MVVNN	DWLNR/L	MWLNR/L	
Article number	25 1112 – 25 1117	25 1404 – 25 1407	25 1696 – 25 1707	25 1708 – 25 1709	25 1712	25 1914 – 25 1915	25 1912 – 25 1923	
Shank size square mm	16 – 32	20 – 32	20 – 32	20 – 32	20 – 32	20 – 25	20 – 32	
Approach angle Degrees	45	93	93	62.5	72.5	95	95	
Version with internal cooling	●	●	●	–	–	●	●	
Toolholder page	742 – 743	746	749	749	750	753	753 – 754	
suitable indexable insert								
Indexable insert Tungsten carbide								
ISO code	SNMG	TNMG	VNMG	VNMG	VNMG	WNGG / WNMA / WNMG	WNGG / WNMA / WNMG	
Article number	25 1142 – 25 1390	25 1432 – 25 1565	25 1732 – 25 1829	25 1732 – 25 1829	25 1732 – 25 1829	25 1962 – 25 2226	25 1962 – 25 2226	
Insert size	12 / 15	16 / 22	16	16	16	08	08	
Indexable insert page	743 – 746	747 – 748	751 – 752	751 – 752	751 – 752	755 – 758	755 – 758	

Toolholder



Toolholder for external machining								
ISO code toolholder	SDNCN	SRDCN	SRGCR/L	SSDCN	SSSCR/L	STGCR/L	STJCR/L	
Article number	26 0300 – 26 0301	26 0611	26 0606 – 26 0607	26 0711	26 0706 – 26 0707	26 0906 – 26 0907	26 0904 – 26 0905	
Shank size square mm	8 – 25	16 – 25	16 – 25	12 – 25	8 – 25	16 – 25	10 – 16	
Approach angle Degrees	62.5	45	90	45	45	90	93	
Version with internal cooling	–	–	–	–	–	–	–	
Toolholder page	775 – 776	786	786	787	787	789	789	
suitable indexable insert								
Indexable insert Tungsten carbide								
ISO code	DCGT / DCMT	RCGT / RCMT / RCGX / RCMX	RCGT / RCMT / RCGX / RCMX	SCGT / SCMT	SCGT / SCMT	TCGT / TCMT	TCGT / TCMT	
Article number	26 0351 – 25 0508	26 0620 – 25 0650	26 0620 – 25 0640	26 0742 – 25 0795	26 0742 – 25 0795	26 0950 – 25 1019	26 0950 – 25 1012	
Insert size	07 / 11	06 / 08 / 10 / 12	06 / 08 / 10	09 / 12	09 / 12	11 / 16	11	
Indexable insert page	782 – 785	786	786	788	788	791	791	



Toolholder for external machining

	PDJNR/L	PDNNR/L	CKJNR/L	CRDNN	CRSNR/L	PSBNR/L	PSDNN	PSKNR/L
	25 0610 – 25 0633	25 0612 – 25 0613	25 1008 – 25 1009	25 5798	25 5795 – 25 5796	25 1106 – 25 1107	25 1114	25 1110 – 25 1111
	16 – 32	16 – 32	20 – 32	25 – 32	25 – 32	20 – 32	16 – 25	20 – 32
	93	63	93	45	45	75	45	75
	●	–	–	–	–	–	–	–
	735 – 736	737	741	763	763	742	743	742

suitable indexable insert

	DJNR	DJNR	CKNR	CRDNN	CRSNR/L	PSBNR/L	PSDNN	PSKNR/L
	DJNR	DJNR	CKNR	CRDNN	CRSNR/L	PSBNR/L	PSDNN	PSKNR/L
	25 0652 – 25 0787	25 0652 – 25 0787	25 1030 – 25 1038	25 5770 – 25 5870	25 1030 – 25 1038	25 1142 – 25 1390	25 1142 – 25 1390	25 1142 – 25 1390
	11 / 15	11 / 15	16	12	12	12 / 15	12 / 15	12 / 15
	737 – 740	737 – 740	741	763	763	743 – 745	743 – 745	743 – 745



Toolholder for external machining

	PWJNR/L	SCACR/L	SCLCR/L	SCRCR/L	SCSCR/L	SDACR/L	SDHCR/L	SDJCR/L
	25 1910 – 25 1925	26 0014 – 26 0015	26 0006 – 26 0049	26 0004 – 26 0005	26 0000 – 26 0001	26 0298 – 26 0299	26 0306 – 26 0307	26 0290 – 26 0309
	16 – 32	8 – 16	8 – 25	20 – 32	8 – 25	8 – 16	10 – 25	8 – 25
	95	90	95	93	45	90	107.5	93
	●	–	●	–	–	–	–	●
	753 – 754	765	764 – 765	765	766	776	775	774 – 775

suitable indexable insert

	WNGG / WNMA / WNMG	CCGT / CCMT	CCGT / CCMT	CCGT / CCMT	CCGT / CCMT	DCGT / DCMT	DCGT / DCMT	DCGT / DCMT
	WNGG / WNMA / WNMG	CCGT / CCMT	CCGT / CCMT	CCGT / CCMT	CCGT / CCMT	DCGT / DCMT	DCGT / DCMT	DCGT / DCMT
	25 1952 – 25 2226	26 0050 – 25 0213	26 0050 – 25 0221	26 0050 – 25 0221	26 0050 – 25 0221	26 0351 – 25 0508	26 0351 – 25 0508	26 0351 – 25 0508
	06 / 08	06 / 09	06 / 09 / 12	06 / 09 / 12	06 / 09 / 12	07 / 11	07 / 11	07 / 11
	755 – 758	770 – 773	770 – 773	770 – 773	770 – 773	782 – 785	782 – 785	782 – 785



Toolholder for external machining

	SVHBR/L	SVJBR/L	SVVBN	SVHCR/L	SVJCR/L	SVLCR/L	SVVCN
	26 1106 – 26 1107	26 1108 – 26 1123	26 1111	26 1298 – 26 1309	26 1136 – 26 1313	26 1306 – 26 1307	26 1317
	12 – 25	12 – 25	12 – 25	16 – 25	16 – 25	8 – 12	8 – 25
	107.5	93	72.5	107.5	93	95	72.5
	–	●	–	●	●	–	–
	792	792	793	796 – 797	796 – 798	797	–

suitable indexable insert

	VBGT / VBMT	VBGT / VBMT	VBGT / VBMT	VCMT / VCMT	VCMT / VCMT	VCMT / VCMT	VCMT / VCMT
	VBGT / VBMT	VBGT / VBMT	VBGT / VBMT	VCMT / VCMT	VCMT / VCMT	VCMT / VCMT	VCMT / VCMT
	26 1142 – 25 1259	26 1142 – 25 1259	26 1142 – 25 1259	26 1364 – 25 1476	26 1364 – 25 1476	26 1360 – 25 1362	26 1360 – 25 1476
	11 / 16	11 / 16	11 / 16	11 / 16	11 / 16	07	07 / 11 / 16
	795 – 796	795 – 796	795 – 796	805 – 806	805 – 806	804	804 – 806



Garant

HOLEX

Overview – boring bars for internal machining

Boring bar



Boring bars for internal machining

ISO code toolholder	DCLNR/L	PCKNR/L	PCLNR/L	PDUNR/L	CKUNR/L	PTFNR/L	MVPNR/L	
Item number	25 0034 – 25 0035	25 0042 – 25 0043	25 0036 – 25 0037	25 0626 – 25 0627	25 1016 – 25 1017	25 1416 – 25 1417	25 1720 – 25 1721	
Shank size Ø	25 – 32	25 – 32	16 – 50	20 – 50	25 – 32	25 – 40	25 – 40	
Setting angle	95	75	95	93	93	90	117,5	
Minimum pre-drill Ø D _{min}	29,5 – 38	32 – 40	20 – 63	25 – 63	36 – 40	32 – 50	32 – 50	
Boring bar page	729	730	729	737	741	747	750	

suitable indexable insert

Indexable insert
Tungsten carbide

ISO code	CNMA / CNMG / CNMM	CNMA / CNMG / CNMM	CNMA / CNMG / CNMM	DNMG	KNUX	TNMA / TNMG	VNMG	
Item number	25 0058 – 25 0493	25 0058 – 25 0493	25 0050 – 25 0504	25 0652 – 25 0787	25 1030 – 25 1038	25 1432 – 25 1565	25 1732 – 25 1829	
Indexable insert size	12	12	09 / 12 / 16	11 / 15	16	16 / 22	16	
Indexable insert page	730 – 734	730 – 734	730 – 734	737 – 740	741	747 – 748	751 – 752	

Boring bar



Boring bars for internal machining

ISO code toolholder	SDQCR/L	SDUCR/L	SDXCR/L	SGLCR/L	SGLPR/L	SGSPR/L	SSSCR/L	
Item number	26 0320 – 26 0341	26 0318 – 26 0343	26 0344 – 26 0345	26 8732 – 26 8736	26 8722 – 26 8736	26 8802 – 26 8806	26 0722 – 26 0723	
Shank size Ø	4 – 40	4 – 40	8 – 25	10 – 12	6 – 12	12	16 – 25	
Setting angle	107,5	93	93	95	95	45	45	
Minimum pre-drill Ø D _{min}	12 – 40	8 – 18	9,2 – 31,5	9,15 – 15,52	9,15 – 15,52	10,72	20 – 32	
Boring bar page	776 / 778 / 780	777 – 779 / 781	781	823	823	823	787	

suitable indexable insert

Indexable insert
Carbide

ISO code	DCGT / DCMT	DCGT / DCMT	DCGT / DCMT	GPCT	GPCT	GPCT	SCGT / SCMT	
Item number	26 0350 – 26 0508	26 0350 – 26 0508	26 0350 – 26 0508	26 8590 – 26 8600	26 8560 – 26 8570	26 8560 – 26 8570	26 0742 – 26 0791	
Indexable insert size	04 / 07 / 11	04 / 07 / 11	04 / 07 / 11	06	S5	S5	09	
Indexable insert page	782 – 785	782 – 785	782 – 785	823	823	823	788	

Boring bar



Boring bars for internal machining

ISO code toolholder	SVLCR/L	SVOCR/L	SVQCR/L	SVUCR/L	SVVCR/L	SVXCR/L	SV95CR/L	
Item number	26 1332 – 26 1347	26 1376 – 26 1379	26 1344 – 26 1345	26 1318 – 26 1349	26 1336 – 26 1353	26 1356 – 26 1369	26 1342 – 26 1355	
Shank size Ø	8 – 16	8 – 20	16 – 40	16 – 40	8 – 25	8 – 16	8 – 16	
Setting angle	95	140	107,5	93	72,5	113	95	
Minimum pre-drill-Ø D _{min}	9,2 – 19,5	8 – 24	21 – 49	20 – 49	10,2 – 19,5	9,2 – 19,5	9,2 – 19,5	
Boring bar page	799 / 803	799 / 802	802	800 – 801 / 803	800 / 804	799 / 802	800 / 804	

suitable indexable insert

Indexable insert
Carbide

ISO code	VCGT / VCMT	VCGT / VCMT	VCGT / VCMT	VCGT / VCMT	VCGT / VCMT	VCGT / VCMT	VCGT / VCMT	
Item number	26 1358 – 26 1362	26 1358 – 26 1472	26 1358 – 26 1476	26 1358 – 26 1476	26 1358 – 26 1476	26 1358 – 26 1362	26 1358 – 26 1362	
Indexable insert size	05 / 07	05 / 07 / 11	11 / 16	11 / 16	05 / 07 / 11 / 16	05 / 07	05 / 07	
Indexable insert page	804	804 – 806	805 – 806	805 – 806	804 – 806	804	804	



Boring bars for internal machining

MVUNR/L	MVZNR/L	MWLNR/L	PWLNR/L	SCLCR/L	SCLDR/L
25 1724 – 25 1725	25 1728 – 25 1729	25 1936 – 25 1937	25 1942 – 25 1943	26 0016 – 26 0033	26 8702 – 26 8718
25 – 40	32 – 40	25 – 40	16 – 32	4 – 40	4 – 8
93	95	95	95	95	95 / 97
32 – 50	48 – 57	32 – 50	21 – 40	5 – 8,9	4,57 – 9,05
750	750	755	755	766 – 769	822

suitable indexable insert

VNMG	VNMG	WNGG / WNMA / WNMG	WNGG / WNMA / WNMG	CCGT / CCMT	CDCT
25 1732 – 25 1829	25 1732 – 25 1829	25 1962 – 25 2224	25 1952 – 25 2226	26 0046 – 26 0221	26 8520 – 26 8540
16	16	08	06 / 08	03 / 06 / 09 / 12	S4
751 – 752	751 – 752	755 – 758	755 – 758	769 – 773	822



Boring bars for internal machining

STFCR/L	STLDR/L	SVJBR/L	SVQBR/L	SVUBR/L	SVJCR/L
26 0918 – 26 0935	26 8812 – 26 8826	26 1112 – 26 1125	26 1130 – 26 1131	26 1118 – 26 1133	26 1326 – 26 1339
10 – 40	6 – 8	16 – 5	16 – 25	16 – 40	8 – 25
90	95	142	107.5	93	142
12 – 49	7.06 – 9.14	22 – 28	21 – 32	21 – 49	8 – 28
789 – 790	824	793	794	793 – 794	798 / 801

suitable indexable inserts

TCGT / TCMT	TDAT	VBGT / VBMT	VBGT / VBMT	VBGT / VBMT	VCGT / VCMT
26 0950 – 26 1019	26 8620 – 26 8640	26 1358 – 26 1362	26 1358 – 26 1362	26 1358 – 26 1362	26 1358 – 26 1476
11 / 16	07	11 / 16	11 / 16	11 / 16	05 / 07 / 11 / 16
789 – 790	824	795 – 796	795 – 796	795 – 796	804 – 806

OTHER HIGHLIGHTS

Garant MASTER

GARANT Master Mute – vibration-damping

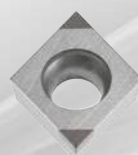
- Mono boring bars – page 808 – 809
- HSK-T / PSC boring bar shanks – page 810
- Standard boring bar shanks – page 811
- Exchangeable cutting heads – page 811 – 814
- Exchangeable cutting head for diamond burnishing – page 814



Garant

Indexable turning inserts CBN / ceramic / MCD / PCD

- CBN – page 760 (negative) and 815 (positive)
- Ceramic – page 762 / 763
- MCD – page 817
- PCD – page 818 / 819



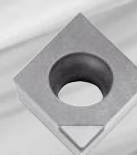
CBN



Ceramic



MCD



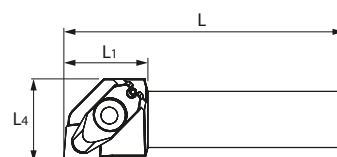
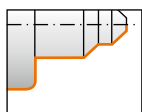
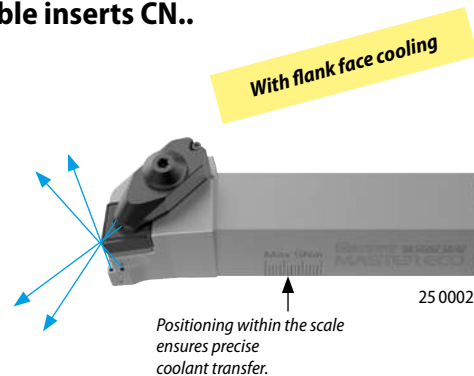
PCD



Garant GARANT Master Eco DCLN 95° clamp toolholder for indexable inserts CN..

Highly efficient cooling directly on the cutting edge and additional flank face cooling.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holder No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



Shank / insert size	21U	25 0002	21U	25 0003	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp, screw, O-ring
		GARANT Master Eco clamp toolholder short										
mm		right-hand		left-hand			mm	mm	mm			
20/12		eShop		eShop	DCLNR/L 2020H12	CN.. 1204..	25	30	100	259031 49	259027 8	259036 22
25/12		eShop		eShop	DCLNR/L 2525H12	CN.. 1204..	32	30	100	259031 49	259027 8	259036 22

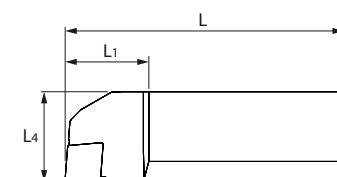
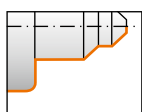
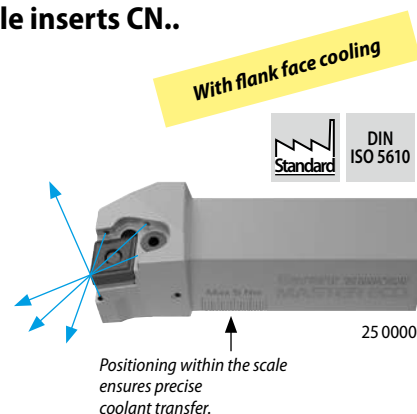
Shank / insert size	21U	25 0038	21U	25 0039	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp, screw, O-ring
		GARANT Master Eco clamp toolholder										
mm		right-hand		left-hand			mm	mm	mm			
20/12		eShop		eShop	DCLNR/L 2020K12	CN.. 1204..	29.5	30	125	259031 49	259027 8	259036 22
25/12		eShop		eShop	DCLNR/L 2525M12	CN.. 1204..	32	30	150	259031 49	259027 8	259036 22



Garant GARANT Master Eco PCLN 95° lever lock toolholder for indexable inserts CN..

Highly efficient cooling directly on the cutter and additional flank face cooling.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holder No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



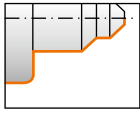
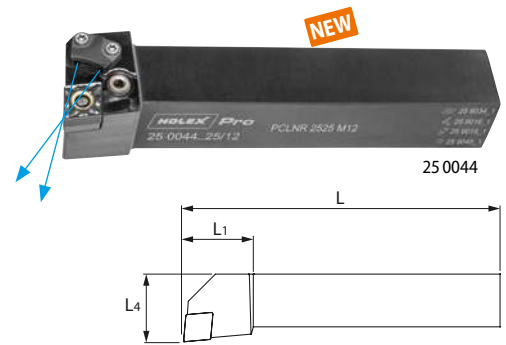
Shank / insert size	21U	25 0000	21U	25 0001	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Spring
		GARANT Master Eco lever lock toolholder short											
mm		right-hand		left-hand			mm	mm	mm				
16/12		eShop		eShop	PCLNR/L 1620F12	CN.. 1204..	25	30	80	259031 5	259015 15	259018 14	259046 4
20/12		eShop		eShop	PCLNR/L 2020X12	CN.. 1204..	25	30	90	259031 5	259015 15	259018 15	259046 4
25/12		eShop		eShop	PCLNR/L 2525H12	CN.. 1204..	32	30	100	259031 5	259015 15	259018 15	259046 4



HOLEX Pro Eco PCLN 95° lever lock toolholder for indexable inserts CN..

Targeted cooling on the cutting edge.

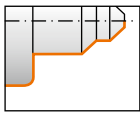
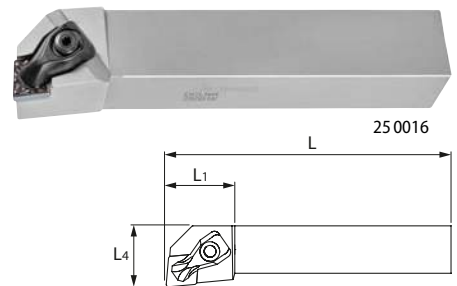
Note: Coolant transfer under the head via hose connection (G1/8 inch – included in delivery).



Shank / insert size	22E 25 0044	22E 25 0045	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Pin
	HOLEX Pro Eco lever lock toolholder										
mm	right-hand	left-hand			mm	mm	mm				
20/12	eShop	eShop	PCLNR/L 2020K12	CN.. 1204..	31	26	125	259034 1	259016 1	259019 1	259045 1
25/12	eShop	eShop	PCLNR/L 2525M12	CN.. 1204..	32	26	150	259034 1	259016 1	259019 1	259045 1



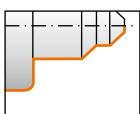
Garant DCLN 95° clamp toolholder for indexable inserts CN..



Shank / insert size	21T 25 0016	21T 25 0017	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp, screw, spring
	Clamp toolholder									
mm	right-hand	left-hand			mm	mm	mm			
20/12	eShop	eShop	DCLNR/L 2020K12	CN.. 1204..	25	30	125	259031 2	259025 10	259035 2
25/12	eShop	eShop	DCLNR/L 2525M12	CN.. 1204..	32	33	150	259031 2	259025 10	259035 2
32/12	eShop	eShop	DCLNR/L 3232P12	CN.. 1204..	40	34	170	259031 2	259025 10	259035 2
25/16	eShop	eShop	DCLNR/L 2525M16	CN.. 1606..	32	36	150	259031 35	259025 11	259035 6
32/16	eShop	eShop	DCLNR/L 3232P16	CN.. 1606..	40	40	170	259031 35	259025 11	259035 6



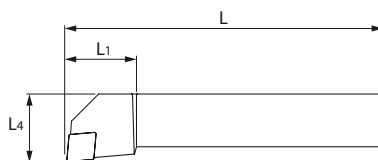
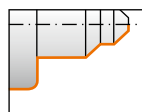
Garant MCLN 95° clamp toolholder for indexable inserts CN..



Shank / insert size	21T 25 0006	21T 25 0007	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp	Screw for clamping claw
	Clamp toolholder										
mm	right-hand	left-hand			mm	mm	mm				
20/12	eShop	eShop	MCLNR/L 2020K12	CN.. 1204..	25	28	125	259031 22	259025 6	259038 4	259021 1
25/12	eShop	eShop	MCLNR/L 2525M12	CN.. 1204..	32	33	150	259031 22	259025 6	259038 4	259021 1
32/12	eShop	eShop	MCLNR/L 3232P12	CN.. 1204..	40	34	170	259031 22	259025 6	259038 4	259021 1
25/16	eShop	eShop	MCLNR/L 2525M16	CN.. 1606..	32	33	150	259031 23	259025 7	259038 4	259021 1
32/16	eShop	eShop	MCLNR/L 3232P16	CN.. 1606..	40	34	170	259031 23	259025 7	259038 4	259021 1

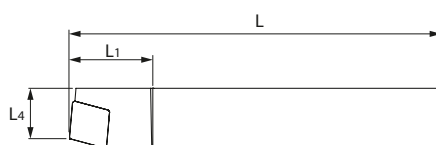
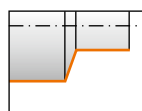


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Garant PCLN 95° lever lock toolholder for indexable inserts CN..


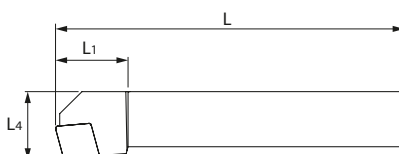
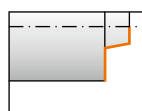
25 0018

Shank / insert size	2T 25 0018	2T 25 0019	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
mm	right-hand	left-hand			mm	mm	mm					
16/09	eShop	eShop	PCLNR/L 1616H09	CN.. 09T3..	20	25	100	259031 27	259015 9	259018 6	259044 5	259047 3
20/09	eShop	eShop	PCLNR/L 2020K09	CN.. 09T3..	25	28	125	259031 27	259015 9	259018 6	259044 5	259047 3
25/09	eShop	eShop	PCLNR/L 2525M09	CN.. 09T3..	32	33	150	259031 27	259015 9	259018 6	259044 5	259047 3
16/12	eShop	eShop	PCLNR/L 1616H12	CN.. 1204..	20	25	100	259031 2	259015 2	259018 8	259044 2	259047 2
20/12	eShop	eShop	PCLNR/L 2020K12	CN.. 1204..	25	28	125	259031 2	259015 2	259018 2	259044 2	259047 2
25/12	eShop	eShop	PCLNR/L 2525M12	CN.. 1204..	32	33	150	259031 2	259015 2	259018 2	259044 2	259047 2
32/12	eShop	eShop	PCLNR/L 3232P12	CN.. 1204..	40	30	170	259031 2	259015 2	259018 2	259044 2	259047 2
25/16	eShop	eShop	PCLNR/L 2525M16	CN.. 1606..	32	33	150	259031 35	259015 12	259018 11	259044 6	259047 4
32/16	eShop	eShop	PCLNR/L 3232P16	CN.. 1606..	40	40	170	259031 35	259015 12	259018 11	259044 6	259047 4
32/19	eShop	eShop	PCLNR/L 3232P19	CN.. 1906..	40	40	170	259031 36	259015 13	259018 13	259044 7	259047 5


Garant PCBN 75° lever lock toolholder for indexable inserts CN..


25 0020

Shank / insert size	2T 25 0020	2T 25 0021	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
mm	right-hand	left-hand			mm	mm	mm					
16/09	eShop	eShop	PCBNR/L 1616H09	CN.. 09T3..	16	20	100	259031 27	259015 9	259018 6	259044 5	259047 3
20/09	eShop	eShop	PCBNR/L 2020K09	CN.. 09T3..	20	21	125	259031 27	259015 9	259018 6	259044 5	259047 3
25/09	eShop	eShop	PCBNR/L 2525M09	CN.. 09T3..	25	21	150	259031 27	259015 9	259018 6	259044 5	259047 3
20/12	eShop	eShop	PCBNR/L 2020K12	CN.. 1204..	25	28	125	259031 2	259015 2	259018 2	259044 2	259047 2
25/12	eShop	eShop	PCBNR/L 2525M12	CN.. 1204..	32	33	150	259031 2	259015 2	259018 2	259044 2	259047 2
25/16	eShop	eShop	PCBNR/L 2525M16	CN.. 1606..	22	29	150	259031 35	259015 12	259018 11	259044 6	259047 4
32/16	eShop	eShop	PCBNR/L 3232P16	CN.. 1606..	27	35	170	259031 35	259015 12	259018 11	259044 6	259047 4


Garant PCKN 75° lever lock toolholder for indexable inserts CN..


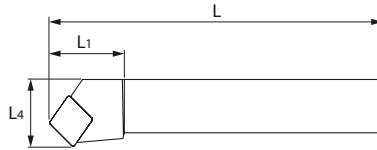
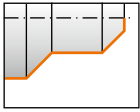
25 0022

Shank / insert size	2T 25 0022	2T 25 0023	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
mm	right-hand	left-hand			mm	mm	mm					
16/09	eShop	eShop	PCKNR/L 1616H09	CN.. 09T3..	20	22	100	259031 27	259015 9	259018 6	259044 5	259047 3
20/09	eShop	eShop	PCKNR/L 2020K09	CN.. 09T3..	25	20	125	259031 27	259015 9	259018 6	259044 5	259047 3
25/09	eShop	eShop	PCKNR/L 2525M09	CN.. 09T3..	32	25	150	259031 27	259015 9	259018 6	259044 5	259047 3
20/12	eShop	eShop	PCKNR/L 2020K12	CN.. 1204..	25	28	125	259031 2	259015 2	259018 2	259044 2	259047 2
25/12	eShop	eShop	PCKNR/L 2525M12	CN.. 1204..	32	33	150	259031 2	259015 2	259018 2	259044 2	259047 2
25/16	eShop	eShop	PCKNR/L 2525M16	CN.. 1606..	32	30	150	259031 35	259015 12	259018 11	259044 6	259047 4
32/16	eShop	eShop	PCKNR/L 3232P16	CN.. 1606..	40	34	170	259031 35	259015 12	259018 11	259044 6	259047 4



Garant

PCSN 45° lever lock toolholder for indexable inserts CN..



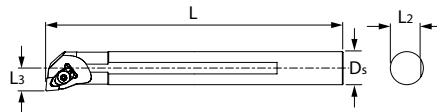
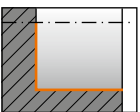
25 0024

Shank / insert size	21T 25 0024	21T 25 0025	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Lever lock toolholder											
mm	right-hand	left-hand			mm	mm	mm					
16/09	eShop	eShop	PCSNR/L 1616H09	CN.. 09T3..	20	22	100	259031 27	259015 9	259018 6	259044 5	259047 3
20/09	eShop	eShop	PCSNR/L 2020K09	CN.. 09T3..	25	26	125	259031 27	259015 9	259018 6	259044 5	259047 3
25/09	eShop	eShop	PCSNR/L 2525M09	CN.. 09T3..	32	25	150	259031 27	259015 9	259018 6	259044 5	259047 3
20/12	eShop	eShop	PCSNR/L 2020K12	CN.. 1204..	25	28	125	259031 2	259015 2	259018 2	259044 2	259047 2
25/12	eShop	eShop	PCSNR/L 2525M12	CN.. 1204..	32	33	150	259031 2	259015 2	259018 2	259044 2	259047 2
25/16	eShop	eShop	PCSNR/L 2525M16	CN.. 1606..	32	33	150	259031 35	259015 12	259018 11	259044 6	259047 4
32/16	eShop	eShop	PCSNR/L 3232P16	CN.. 1606..	40	34	170	259031 35	259015 12	259018 11	259044 6	259047 4



Garant

A... DCLN 95° boring bars for indexable inserts CN..



25 0034

Shank Ø / insert size	21U 25 0034	21U 25 0035	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Shim	Shim screw	Clamp, screw, O-ring
	Boring bar, steel										
mm	right-hand	left-hand			mm	mm	mm	mm			
25/12	eShop	eShop	A25X DCLNR/L12	CN.. 1204..	29.5	17	24.3	225	259033 2	259027 2	259036 1
32/12	eShop	eShop	A32X DCLNR/L12	CN.. 1204..	38	22	31	288	259033 2	259027 2	259036 1

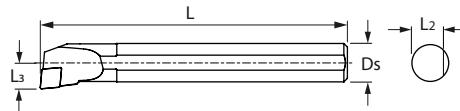
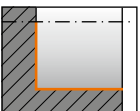


DIN 8024



Garant

A... PCLN 95° boring bars for indexable inserts CN..



25 0036

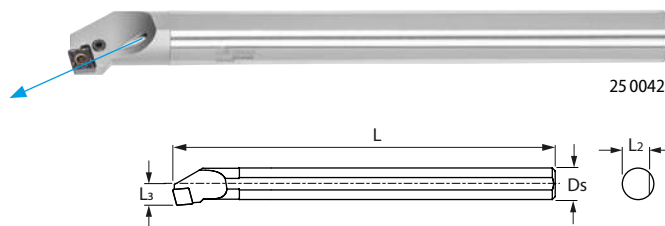
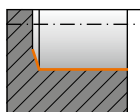
Shank Ø / insert size	21T 25 0036	21T 25 0037	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Boring bar, steel												
mm	right-hand	left-hand			mm	mm	mm	mm					
16/09	eShop	eShop	A16M PCLNR/L09	CN.. 09T3..	20	11	15.25	150	—	259015 11	259018 9	—	—
20/09	eShop	eShop	A20Q PCLNR/L09	CN.. 09T3..	25	13	18	180	—	259015 11	259018 9	—	—
25/09	eShop	eShop	A25R PCLNR/L09	CN.. 09T3..	32	17	23	200	259031 27	259015 10	259018 12	259044 4	259047 2
25/12	eShop	eShop	A25R PCLNR/L12	CN.. 1204..	32	17	24	200	259031 2	259015 2	259018 8	259044 2	259047 2
32/12	eShop	eShop	A32S PCLNR/L12	CN.. 1204..	40	22	31	250	259031 2	259015 2	259018 2	259044 2	259047 2
40/12	eShop	eShop	A40T PCLNR/L12	CN.. 1204..	50	27	38.5	300	259031 2	259015 2	259018 2	259044 2	259047 2
50/12	eShop	eShop	A50U PCLNR/L12	CN.. 1204..	63	35	48	350	259031 2	259015 2	259018 2	259044 2	259047 2
40/16	eShop	eShop	A40T PCLNR/L16	CN.. 1606..	50	27	38.5	300	259031 35	259015 12	259018 11	259044 6	259047 4
50/16	eShop	eShop	A50U PCLNR/L16	CN.. 1606..	63	35	48	350	259031 35	259015 12	259018 11	259044 6	259047 4



25



Garant A... PCKN 75° boring bars for indexable inserts CN..



Shank Ø / insert size	2T 25 0042	2T 25 0043	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Boring bar, steel												
mm	right-hand	left-hand			mm	mm	mm	mm					
25/12	eShop	eShop	A25T PCKNR/L12	CN.. 1204..	32	17	23	300	259031 2	259015 2	259018 8	259044 2	259047 2
32/12	eShop	eShop	A32U PCKNR/L12	CN.. 1204..	40	22	31	350	259031 2	259015 2	259018 2	259044 2	259047 2

Indexable inserts CNM.

CNMG Finishing

Note:

25 0070/0071 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7415-1	
2T 25 0050	eShop	eShop	eShop	eShop	eShop	eShop	—	10
2T 25 0052	eShop	eShop	eShop	eShop	eShop	eShop	—	10
2T 25 0058	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2T 25 0060	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●	P	P	P	M	M	M	S	
○	—	—	—	—	—	—	M	
⚙	SS	SS	SS	VS	VS	VS	TIS	
Chip breaker	SS	SS	SS	VS	VS	VS	TIS	
a _p	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2.5	0.3 – 2.5	0.3 – 2.5	0.2 – 2	
f	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.15 – 0.5	0.15 – 0.5	0.15 – 0.5	0.1 – 0.2	
v _c main application	170 – 500	160 – 400	150 – 350	90 – 290	80 – 270	70 – 230	50 – 110	
v _c secondary application (25 0058, 25 0060)	—	—	—	—	—	—	70 – 250	



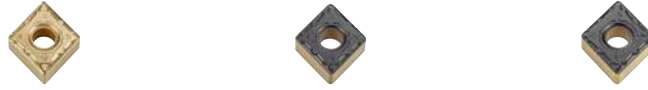
Type	HB7020-2	
2T 25 0059	eShop	10
2T 25 0061	eShop	10
●	P	
⚙	WSS	
Chip breaker	WSS	
a _p	0.3 – 2.5	
f	0.1 – 0.5	
v _c main application	170 – 480	



Grade	IC8150	IC8250	IC6015	IC6025	
268 25 0070	—	—	—	—	10
268 25 0071	—	—	—	—	10
●	P	P	M	M	
⚙	F3P	F3P	F3M	F3M	
Chip breaker	F3P	F3P	F3M	F3M	
a _p	0.4 – 3.5	0.4 – 3.5	0.1 – 1.5	0.1 – 1.5	
f	0.05 – 0.25	0.05 – 0.25	0.1 – 0.3	0.1 – 0.3	
v _c main application	180 – 400	150 – 380	140 – 300	120 – 230	



Grade		CCX	PV720	CA510	CA115P	CA125P	CA6525	PR115S	SW05	
25E 25 0102	KYOCERA CNMG 120404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 0104	KYOCERA CNMG 120408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
●		P	P	P	P	P	M	S	Ti	
⚙		●	●	●	●	●	●	●	●	
Chip breaker		PP	PQ	PQ	PQ	PQ	MQ	MQ	MQ	
a_p	mm	0.2 – 1.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.3 – 2	0.2 – 1	0.2 – 1	
f	mm/rev.	0.05 – 0.35	0.05 – 0.3	0.13 – 0.4	0.13 – 0.4	0.13 – 0.4	0.05 – 0.25	0.04 – 0.2	0.05 – 0.3	
v_c main application	m/min	210 – 450	110 – 520	180 – 590	180 – 400	150 – 320	60 – 220	25 – 70	50 – 140	



Grade		CA510	CA115P	CA125P	
25E 25 0103	KYOCERA CNMG 120404 wiper	eShop	eShop	eShop	1
25E 25 0105	KYOCERA CNMG 120408 wiper	eShop	eShop	eShop	1
●		P	P	P	
⚙		●	●	●	
Chip breaker			WP		
a_p	mm		0.3 – 1.2		
f	mm/rev.		0.06 – 0.42		
v_c main application	m/min	180 – 590	180 – 400	150 – 320	

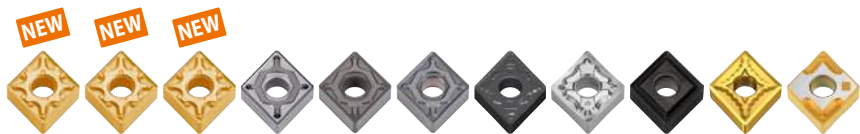


Grade		HBT020	HBT130	
22D 25 0090	CNMG 09T304	eShop	eShop	–
22D 25 0092	HOLEX CNMG 120404	eShop	eShop	–
22D 25 0093	CNMG 120408	eShop	eShop	–
●		P	M	
⚙		●	●	
Chip breaker		PF	MF	
a_p	mm	0.5 – 2	0.5 – 2.5	
f	mm/rev.	0.1 – 0.4	0.15 – 0.45	
v_c main application	m/min	120 – 330	60 – 220	

CNM. Medium machining

Note:

25 0270–0272 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	HU7305-1	HB7415-1	HB725-1	HB730-1	
21G 25 0152	CNMG 09T308	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	–	–	–	10
21G 25 0156	CNMG 120404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G 25 0158	CNMG 120408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G 25 0165	CNMA 120408	–	–	–	–	–	–	eShop	–	–	–	–	–
21G 25 0160	Garant CNMG 120412	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	eShop	eShop	–	10
21G 25 0161	CNMA 120412	–	–	–	–	–	–	eShop	–	–	–	–	–
21G 25 0162	CNMG 120416	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	–	–	–	10
21G 25 0168	CNMG 160608	eShop	eShop	eShop	eShop	eShop	eShop	–	–	–	–	–	10
21G 25 0170	CNMG 160612	eShop	eShop	eShop	eShop	eShop	eShop	–	–	–	–	–	10
●		P	P	P	M	M	M	K	N	S	UNI	UNI	
○		–	–	–	–	–	–	–	–	M	–	–	
⚙		●	●	●	●	●	●	●	●	●	●	●	
Chip breaker	(25 0152, 25 0156, 25 0158, 25 0160, 25 0162, 25 0168, 25 0170)	SM	SM	SM	VM	VM	VM	GM	AM1	TIM	UM1	XUM	
a_p	mm	0.3 – 4	0.3 – 4	0.3 – 4	0.5 – 4	0.5 – 4	0.5 – 4	0.4 – 6.5	0.2 – 5	0.5 – 4	0.2 – 6	0.5 – 6	
f	mm/rev.	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.3 – 0.7	0.05 – 0.6	0.1 – 0.3	0.05 – 0.6	0.2 – 0.6	
v_c main application	m/min	140 – 440	130 – 370	120 – 320	80 – 260	70 – 240	60 – 200	100 – 450	400 – 700	40 – 90	50 – 250	35 – 230	
v_c secondary application	(25 0156, 25 0158, 25 0160)	–	–	–	–	–	–	–	–	60 – 220	–	–	



25



Type	HB7020-2				
2IG 25 0157	Garant	CNMG 120408 wiper	eShop		10
2IG 25 0159		CNMG 120412 wiper	eShop		10
●			P		
⚙			WSM		
Chip breaker			WSM		
a_p		mm	0.5 – 4		
f		mm/rev.	0.2 – 0.6		
v_c main application		m/min	140 – 420		



Grade	IC8150				IC8250				IC6015				IC6025				
26B 25 0270	IsCAR	CNMG 120404	—		—				—				—				10
26B 25 0271		CNMG 120408	—		—				—				—				10
26B 25 0272		CNMG 120412	—		—				—				—				10
●			P		P				M				M				
⚙			M3P		M3P				M3M				M3M				
Chip breaker			M3P		M3P				M3M				M3M				
a_p		mm	0.5 – 5														
f		mm/rev.	0.15 – 0.6		0.15 – 0.6				0.17 – 0.5				0.17 – 0.5				
v_c main application		m/min	180 – 400		150 – 380				140 – 300				120 – 230				



NEW

Grade			PV720	CA510	CA115P	CA125P	CA6525	CA315	KW10	PDL010	PR115S	SW05		
25E	25 0210	 KYOCERA	CNMG 120404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1	
25E	25 0212		CNMG 120408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1	
25E	25 0214		CNMG 120412	eShop	eShop	eShop	eShop	eShop	eShop	—	—	—	—	1
25E	25 0216		CNMG 120416	—	—	eShop	eShop	eShop	—	—	—	—	—	10
			P	P	P	P	M	O	N	N	S	Ti		
														
Chip breaker			PG	PS	PMG	PMG	MS (brass)	KG	AH	AH	MU	MU		
a_p		mm	1 – 3.5	1 – 3.5	0.5 – 5	0.5 – 5	0.7 – 4	0.5 – 4	1 – 4	1 – 3.5	0.5 – 2	0.5 – 2		
f		mm/rev.	0.15 – 0.35	0.15 – 0.35	0.15 – 0.5	0.15 – 0.5	0.1 – 0.35	0.15 – 0.5	0.1 – 0.35	0.1 – 0.4	0.09 – 0.3	0.1 – 0.35		
v. main application		m/min	110 – 490	80 – 450	180 – 400	150 – 320	60 – 220	150 – 350	60 – 400	200 – 600	25 – 70	50 – 140		



Grade	CA510				CA115P				CA125P				
25E 25 0211	KYOCERA	CNMG 120404 wiper	eShop		eShop				eShop				1
25E 25 0213		CNMG 120408 wiper	eShop		eShop				eShop				1
25E 25 0215		CNMG 120412 wiper	—		eShop				eShop				1
●			P		P				P				
⚙			WQ		WQ				WQ				
Chip breaker			WQ		WQ				WQ				
a_p		mm	0.5 – 3		0.5 – 3				0.5 – 3				
f		mm/rev.	0.14 – 0.5		0.14 – 0.5				0.14 – 0.5				
v_c main application		m/min	80 – 450		180 – 400				150 – 320				



Grade			HBT020	HBT130	
22D	25 0188	CNMG 09T304	eShop	eShop	—
22D	25 0196	CNMG 120404	eShop	eShop	—
22D	25 0197	HOLEX CNMG 120408	eShop	eShop	—
22D	25 0198	CNMG 120412	eShop	eShop	—
22D	25 0204	CNMG 160608	eShop	eShop	—
●			P	M	
⚙			PM	MM	
Chip breaker					
a _p		mm	0.8 – 5	0.5 – 5	
f		mm/rev.	0.1 – 0.45	0.12 – 0.45	
v _c main application		m/min	100 – 280	50 – 200	

CNMG Roughing



Grade			HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	
21G	25 0322	CNMG 120408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G	25 0324	CNMG 120412	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G	25 0328	Garant CNMG 120416	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G	25 0334	CNMG 160608	eShop	eShop	eShop	eShop	eShop	eShop	—	10
21G	25 0336	CNMG 160612	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G	25 0338	CNMG 160616	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●			P	P	P	M	M	M	K	
⚙			SG	SG	SG	VG	VG	VG	GG	
Chip breaker										
a _p		mm	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6	0.4 – 6.5	
f		mm/rev.	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.32 – 0.8	
v _c main application		m/min	120 – 415	110 – 360	100 – 290	70 – 240	60 – 220	50 – 170	100 – 450	



Grade			CA510	CA115P	CA125P	
25E	25 0371	CNMG 120408	eShop	eShop	eShop	1
25E	25 0372	CNMG 120412	eShop	eShop	eShop	1
25E	25 0373	CNMG 120416	—	eShop	eShop	1
25E	25 0376	CNMG 160608	eShop	eShop	eShop	1
25E	25 0377	KYOCERA CNMG 160612	eShop	eShop	eShop	1
25E	25 0378	CNMG 160616	eShop	eShop	eShop	1
25E	25 0382	CNMG 190608	eShop	eShop	eShop	1
25E	25 0383	CNMG 190612	eShop	eShop	eShop	1
25E	25 0384	CNMG 190616	—	eShop	eShop	10
●			P	P	P	
⚙				PH		
Chip breaker						
a _p		mm		1 – 10		
f		mm/rev.		0.28 – 0.88		
v _c main application		m/min	80 – 450	170 – 380	140 – 300	



25



Grade			HBT020	HBT130	
22D	25 0218	CNMG 120408	eShop	eShop	—
22D	25 0219	CNMG 120412	eShop	eShop	—
22D	25 0220	CNMG 160608	eShop	eShop	—
22D	25 0221	CNMG 160612	eShop	eShop	—
●			P	M	
⚙			PR	MR	
Chip breaker					
a_p		mm	1.8 – 6	2 – 6	
f		mm/rev.	0.2 – 0.6	0.15 – 0.55	
v_c main application		m/min	80 – 260	40 – 180	

CNMM Rough machining

NEW



NEW



Grade			HB7020-2	HB7130-2	
21G	25 0452	CNMM 120408	eShop	eShop	10
21G	25 0453	CNMM 120412	eShop	eShop	10
21G	25 0455	CNMM 120416	eShop	eShop	10
21G	25 0458	CNMM 160612	eShop	eShop	10
21G	25 0460	CNMM 160616	eShop	eShop	10
21G	25 0462	CNMM 160624	eShop	eShop	10
●			P	M	
⚙			SR	VR	
Chip breaker					
a_p		mm	2 – 10		
f		mm/rev.	0.4 – 1.2	0.2 – 0.9	
v_c main application		m/min	140 – 300	50 – 200	



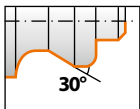
Grade			CA510	CA115P	CA125P	
25E	25 0491	CNMM 120408	eShop	eShop	eShop	1
25E	25 0492	CNMM 120412	eShop	eShop	eShop	1
25E	25 0493	CNMM 120416	—	—	eShop	1
25E	25 0496	CNMM 160608	—	—	eShop	1
25E	25 0497	CNMM 160612	—	eShop	eShop	1
25E	25 0498	CNMM 160616	—	eShop	eShop	1
25E	25 0502	CNMM 190608	—	—	eShop	1
25E	25 0503	CNMM 190612	—	eShop	eShop	1
25E	25 0504	CNMM 190616	—	eShop	eShop	1
●			P	P	P	
⚙			PX			
Chip breaker						
a_p		mm	1 – 11			
f		mm/rev.	0.25 – 0.9			
v_c main application		m/min	80 – 450	170 – 380	140 – 300	



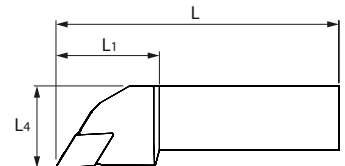
Garant GARANT Master Eco .DJN 93° clamp / lever lock toolholder for indexable inserts DN..

Highly efficient cooling directly on the cutting edge and additional flank face cooling.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holders No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



With flank face cooling



Clamping with clamp



Positioning within the scale ensures precise coolant transfer.

Shank / insert size	2TU 25 0630	2TU 25 0631	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp, screw, spring
mm	right-hand	left-hand			mm	mm	mm			
20/11	eShop	eShop	DDJNR/L 2020X11	DN.. 1104..	25	35	95	269007 1	259027 3	259036 23
20/15	eShop	eShop	DDJNR/L 2020H15	DN.. 1506..	25	40	100	259031 50	259027 8	259036 24
25/15	eShop	eShop	DDJNR/L 2525X15	DN.. 1506..	32	40	110	259031 50	259027 8	259036 24

Shank / insert size	2TU 25 0628	2TU 25 0629	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp, screw, spring
mm	right-hand	left-hand			mm	mm	mm			
20/11	eShop	eShop	DDJNR/L 2020K11	DN.. 1104..	25	35	125	269007 1	259027 3	259036 23
20/15	eShop	eShop	DDJNR/L 2020K15	DN.. 1506..	25	40	125	259031 50	259027 8	259036 24
25/15	eShop	eShop	DDJNR/L 2525M15	DN.. 1506..	32	40	150	259031 50	259027 8	259036 24

Clamping with toggle lever

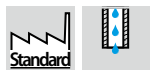


Positioning within the scale ensures precise coolant transfer.

Shank / insert size	2TU 25 0624	2TU 25 0625	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Spring
mm	right-hand	left-hand			mm	mm	mm				
16/11	eShop	eShop	PDJNR/L 1616X11	DN.. 1104..	20	35	85	259031 44	259015 16	259018 16	259046 5
20/11	eShop	eShop	PDJNR/L 2020X11	DN.. 1104..	25	35	95	259031 44	259015 16	259018 16	259046 5
20/15	eShop	eShop	PDJNR/L 2020H15	DN.. 1506..	25	40	100	259031 45	259015 17	259018 17	259046 4
25/15	eShop	eShop	PDJNR/L 2525X15	DN.. 1506..	32	40	110	259031 45	259015 17	259018 17	259046 4



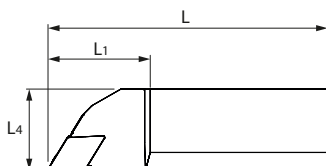
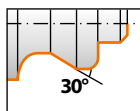
25

**HOLEX**

HOLEX Pro Eco PDJN 93° lever lock toolholder for indexable inserts DN..

Targeted cooling on the cutting edge.

Note: Coolant transfer under the head via hose connection (G1/8 inch – included in delivery).

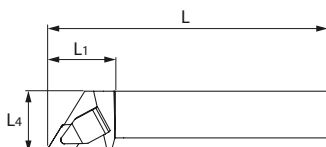
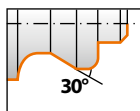


25 0632

Shank / insert size	22E 25 0632	22E 25 0633	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Pin
	HOLEX Pro Eco lever lock toolholder										
mm	right-hand	left-hand			mm	mm	mm				
20/15	eShop	eShop	PDJNR/L 2020K15	DN.. 1506..	32	36	125	259034 2	259016 1	259019 2	259045 1
25/15	eShop	eShop	PDJNR/L 2525M15	DN.. 1506..	32	36	150	259034 2	259016 1	259019 2	259045 1

**Garant****Garant**

DDJN 93° clamp toolholder for indexable inserts DN..

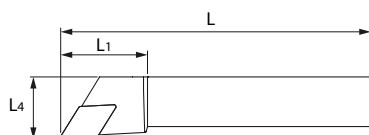
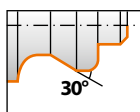


25 0608

Shank / insert size	21T 25 0608	21T 25 0609	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp, screw, spring
	Clamp toolholder									
mm	right-hand	left-hand			mm	mm	mm			
20/15	eShop	eShop	DDJNR/L 2020K15	DN.. 1506..	25	35	125	259031 28	259025 10	259035 2
25/15	eShop	eShop	DDJNR/L 2525M15	DN.. 1506..	32	36	150	259031 28	259025 10	259035 2
32/15	eShop	eShop	DDJNR/L 3232 P15	DN.. 1506..	40	40	170	259031 28	259025 10	259035 2

Garant

PDJN 93° lever lock toolholder for indexable inserts DN..



DIN ISO 5610

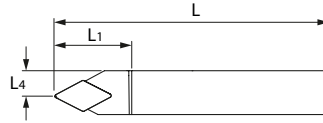
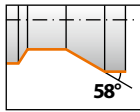


25 0610

Shank / insert size	21T 25 0610	21T 25 0611	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Lever lock toolholder											
mm	right-hand	left-hand			mm	mm	mm					
16/11	eShop	eShop	PDJNR/L 1616H11	DN.. 1104..	20	25	100	259031 7	259015 7	259018 6	259044 4	259047 3
20/11	eShop	eShop	PDJNR/L 2020K11	DN.. 1104..	25	28	125	259031 7	259015 7	259018 6	259044 4	259047 3
25/11	eShop	eShop	PDJNR/L 2525M11	DN.. 1104..	32	33	150	259031 7	259015 7	259018 6	259044 4	259047 3
20/15	eShop	eShop	PDJNR/L 2020K15	DN.. 1506..	25	35	125	259031 28	259015 8	259018 7	259044 2	259047 2
25/15	eShop	eShop	PDJNR/L 2525M15	DN.. 1506..	32	35	150	259031 28	259015 8	259018 7	259044 2	259047 2
32/15	eShop	eShop	PDJNR/L 3232P15	DN.. 1506..	40	36	170	259031 28	259015 8	259018 7	259044 2	259047 2



Garant PDNN 63° lever lock toolholder for indexable inserts DN..



25 0612

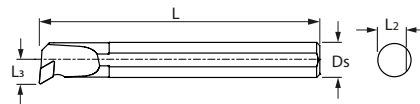
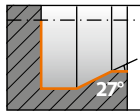
Shank / insert size	2T 25 0612	2T 25 0613	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Lever lock toolholder											
mm	right-hand	left-hand			mm	mm	mm					
16/11	eShop	eShop	PDNNR/L 1616H11	DN.. 1104..	8	25	100	259031 7	259015 7	259018 6	259044 4	259047 3
20/11	eShop	eShop	PDNNR/L 2020K11	DN.. 1104..	10	25	125	259031 7	259015 7	259018 6	259044 4	259047 3
25/11	eShop	eShop	PDNNR/L 2525M11	DN.. 1104..	12	29	150	259031 7	259015 7	259018 6	259044 4	259047 3
20/15	eShop	eShop	PDNNR/L 2020K15	DN.. 1506..	12	35	125	259031 28	259015 8	259018 7	259044 2	259047 2
25/15	eShop	eShop	PDNNR/L 2525M15	DN.. 1506..	12	37	150	259031 28	259015 8	259018 7	259044 2	259047 2
32/15	eShop	eShop	PDNNR/L 3232P15	DN.. 1506..	16.8	37	170	259031 28	259015 8	259018 7	259044 2	259047 2



DIN 8024



Garant A... PDUN 93° boring bars for indexable inserts DN..



25 0626

Shank Ø / insert size	2T 25 0626	2T 25 0627	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Boring bar, steel												
mm	right-hand	left-hand			mm	mm	mm	mm					
20/11	eShop	eShop	A20Q PDUNR/L11	DN.. 1104..	25	16	19	180	—	259015 10	259018 12	—	—
25/11	eShop	eShop	A25R PDUNR/L11	DN.. 1104..	32	18.5	24	200	259031 7	259015 7	259018 6	259044 4	259047 2
32/15	eShop	eShop	A32S PDUNR/L15	DN.. 1506..	40	22	31	250	259031 28	259015 8	259018 7	259044 2	259047 2
40/15	eShop	eShop	A40T PDUNR/L15	DN.. 1506..	50	27	38.5	300	259031 28	259015 8	259018 7	259044 2	259047 2
50/15	eShop	eShop	A50U PDUNR/L15	DN.. 1506..	63	35	48	350	259031 28	259015 8	259018 7	259044 2	259047 2

DNMG indexable inserts

DNMG Finishing

Note:

25 0730/0731 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7415-1	
2IG 25 0652	DNMG 110404	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 25 0654	DNMG 110408	eShop	eShop	eShop	eShop	eShop	—	10
2IG 25 0658	DNMG 150604	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 25 0660	DNMG 150608	eShop	eShop	eShop	eShop	eShop	eShop	10
●	P	P	P	M	M	M	S	
○	—	—	—	—	—	—	M	
⚙	SS	SS	SS	VS	VS	VS	TIS	
Chip breaker	SS	SS	SS	VS	VS	VS	TIS	
a _p	mm	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.2 – 2	
f	mm/rev.	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.2	
v _c main application	m/min	170 – 500	160 – 400	150 – 350	90 – 290	80 – 270	50 – 110	
v _c secondary application (25 0652, 25 0658, 25 0660)	m/min	—	—	—	—	—	70 – 250	



25



Type	HB7020-2			
2IG 25 0653	Garant	DNMG 110404 wiper	eShop	10
2IG 25 0655		DNMG 110408 wiper	eShop	10
2IG 25 0659		DNMG 150604 wiper	eShop	10
2IG 25 0661		DNMG 150608 wiper	eShop	10
●			P	
⚙			WSS	
Chip breaker				
a _p	mm		0.3 – 2.5	
f	mm/rev.		0.1 – 0.5	
v _c main application	m/min		170 – 480	



Grade	IC8150		IC8250		IC6015		IC6025		
26B 25 0730	Iscar	DNMG 150604	—	—	—	—	—	—	10
26B 25 0731		DNMG 150608	—	—	—	—	—	—	10
●			P	P	M	M			
⚙			●	●	●	●			
Chip breaker			F3P	F3P	F3M	F3M			
a _p	mm		0.4 – 3.5	0.4 – 3.5	0.1 – 1.5	0.1 – 1.5			
f	mm/rev.		0.08 – 0.25	0.08 – 0.25	0.1 – 0.4	0.1 – 0.4			
v _c main application	m/min		180 – 400	150 – 380	140 – 300	120 – 230			



Grade	CCX		PV720		CA510		CA115P		CA125P		CA6525		PR115S		SW05		
25E 25 0696	KYOCERA	DNMG 150604	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 0697		DNMG 150608	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
●			P	P	P	P	P	P	P	M	S	Ti					
⚙			●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Chip breaker			PP	PQ	PQ	PQ	PQ	PQ	PQ	MQ	MQ	MQ	MQ	MQ	MQ	MQ	
a _p	mm		0.2 – 1.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.3 – 2	0.2 – 1	0.2 – 1	0.2 – 1	0.2 – 1	0.2 – 1	0.2 – 1	
f	mm/rev.		0.05 – 0.35	0.05 – 0.3	0.13 – 0.4	0.13 – 0.4	0.13 – 0.4	0.13 – 0.4	0.13 – 0.4	0.05 – 0.25	0.04 – 0.2	0.04 – 0.2	0.04 – 0.2	0.04 – 0.2	0.04 – 0.2	0.05 – 0.3	
v _c main application	m/min		210 – 450	110 – 520	180 – 590	180 – 400	150 – 320	60 – 220	25 – 70	50 – 140							



Grade	HBT020			HBT130			
22D 25 0666	HOLEX	DNMG 110404	eShop	eShop			—
22D 25 0668		DNMG 150604	eShop	eShop			—
22D 25 0669		DNMG 150608	eShop	eShop			—
●			P	M			
⚙			●	●			
Chip breaker			PF	MF			
a _p	mm		0.5 – 2				
f	mm/rev.		0.1 – 0.4			0.15 – 0.45	
v _c main application	m/min		120 – 330			60 – 220	

DNMG Medium machining

Note:

25 0810/0811 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-1	HB7140-2	HB7210-1	HU7305-1	HB7415-1	HB725-1	HB730-1	
2IG 25 0752	DNMG 110404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	eShop	eShop	10
2IG 25 0754	DNMG 110408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	eShop	eShop	eShop	10
2IG 25 0760	Garant DNMG 150604	eShop	eShop	eShop	eShop	eShop	eShop	–	eShop	eShop	eShop	eShop	10
2IG 25 0762	DNMG 150608	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 25 0764	DNMG 150612	eShop	eShop	eShop	eShop	eShop	eShop	–	–	eShop	eShop	–	10
●		P	P	P	M	M	M	K	N	S	UNI	UNI	
○		–	–	–	–	–	–	–	–	M	–	–	
⚙		●	●	●	●	●	●	●	●	●	●	●	
Chip breaker		SM	SM	SM	VM	VM	VM	GM	AM1	TIM	UM1	XUM	
a_p	mm	0.3 – 4	0.3 – 4	0.3 – 4	0.5 – 5	0.5 – 5	0.5 – 5	0.4 – 6.5	0.2 – 5	0.5 – 4	0.2 – 6	0.5 – 6	
f	mm/rev.	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.3 – 0.7	0.05 – 0.6	0.1 – 0.3	0.05 – 0.6	0.2 – 0.6	
v_c main application	m/min	140 – 440	130 – 370	120 – 320	80 – 260	70 – 240	60 – 200	100 – 450	400 – 700	40 – 90	50 – 250	35 – 230	
v_c secondary application	m/min	–	–	–	–	–	–	–	–	60 – 220	–	–	



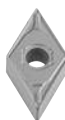
Type		HB7020-2	
2IG 25 0763	DNMG 150608 wiper	eShop	10
2IG 25 0765	Garant DNMG 150612 wiper	eShop	10
●		P	
⚙		●	
Chip breaker		WSM	
a_p	mm	0.5 – 4	
f	mm/rev.	0.2 – 0.6	
v_c main application	m/min	140 – 420	



Grade		IC8150	IC8250	IC6015	IC6025	
268 25 0810	DNMG 150608	–	–	–	–	10
268 25 0811	IsCAR DNMG 150612	–	–	–	–	10
●		P	P	M	M	
⚙		●	●	●	●	
Chip breaker		M3P	M3P	M3M	M3M	
a_p	mm			0.5 – 5		
f	mm/rev.	0.15 – 0.6	0.15 – 0.6	0.17 – 0.5	0.17 – 0.5	
v_c main application	m/min	180 – 400	150 – 380	140 – 300	120 – 230	



Grade		PV720	CA510	CA115P	CA125P	CA6525	CA315	KW10	PR115S	SW05	
25E 25 0796	DNMG 150604	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 0797	KYOCERA DNMG 150608	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 0798	DNMG 150612	eShop	eShop	eShop	eShop	eShop	–	–	–	–	1
●		P	P	P	P	M	O	N	S	Ti	
⚙		●	●	●	●	●	●	●	●	●	
Chip breaker		PG	PS	PMG	PMG	MS	KG	AH	MU	MU	
a_p	mm	1 – 4	1 – 4	0.5 – 5	0.5 – 5	0.7 – 4	0.5 – 3.6	0.8 – 3.5	0.5 – 2	0.5 – 2	
f	mm/rev.	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.1 – 0.35	0.17 – 0.5	0.1 – 0.35	0.09 – 0.3	0.1 – 0.35	
v_c main application	m/min	110 – 490	80 – 450	180 – 400	150 – 320	60 – 220	150 – 350	60 – 400	25 – 70	50 – 140	



Grade			HBT020	HBT130	
22D	25 0780	DNMG 110404	eShop	eShop	—
22D	25 0781	DNMG 110408	eShop	eShop	—
22D	25 0783	DNMG 150604	eShop	eShop	—
22D	25 0784	DNMG 150608	eShop	eShop	—
●			P	M	
⚙			PM	MM	
Chip breaker					
a_p		mm	0.8 – 5	0.5 – 5	
f		mm/rev.	0.1 – 0.45	0.12 – 0.45	
v_c main application		m/min	100 – 280	50 – 200	

DNMG Roughing



Grade			HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	
21G	25 0862	DNMG 150608	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G	25 0864	DNMG 150612	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●			P	P	P	M	M	M	K	
⚙			SG	SG	SG	VG	VG	VG	GG	
Chip breaker										
a_p		mm	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6	0.4 – 6.5	
f		mm/rev.	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.32 – 0.8	
v_c main application		m/min	120 – 415	110 – 360	100 – 290	70 – 240	60 – 220	50 – 170	100 – 450	



Grade			CA115P	CA125P	
25E	25 0892	DNMG 150608	eShop	eShop	1
25E	25 0893	DNMG 150612	eShop	eShop	1
25E	25 0894	DNMG 150616	eShop	eShop	1
●			P	P	
⚙					
Chip breaker				PH	
a_p		mm		1 – 5	
f		mm/rev.		0.25 – 0.6	
v_c main application		m/min	170 – 380	140 – 300	



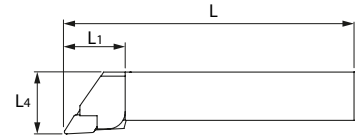
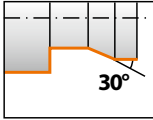
Grade			HBT020	HBT130	
22D	25 0786	DNMG 150608	eShop	eShop	—
22D	25 0787	DNMG 150612	eShop	eShop	—
●			P	M	
⚙			PR	MR	
Chip breaker					
a_p		mm	1.8 – 6	2 – 6	
f		mm/rev.	0.2 – 0.6	0.15 – 0.55	
v_c main application		m/min	80 – 260	40 – 180	



Garant CKJN 93° clamping toolholders for indexable inserts KNUX



25 1008



Shank / insert size	21T 25 1008	21T 25 1009	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim		Clamp		Screw for clamp	Spring	Set of shim pins
	Clamping toolholder							25 1008	25 1009	25 1008	25 1009			
mm	right-hand	left-hand			mm	mm	mm							
20/16	eShop	eShop	CKJNR/L 2020K16	KNUX 1604.. R/L	30	32	125	259031 4	259031 6	259038 16	259038 17	259021 3	259046 3	259044 3
25/16	eShop	eShop	CKJNR/L 2525M16	KNUX 1604.. R/L	32	32	150	259031 4	259031 6	259038 16	259038 17	259021 3	259046 3	259044 3
32/16	eShop	eShop	CKJNR/L 3232P16	KNUX 1604.. R/L	40	32	170	259031 4	259031 6	259038 16	259038 17	259021 3	259046 3	259044 3



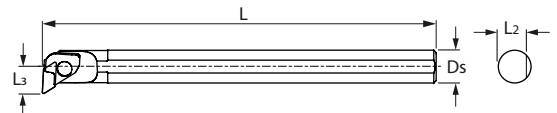
Garant CKUN 93° boring bars for indexable inserts KNUX

Note:

- 25 1016 – With KNUX 1604.. Use L insert
25 1017 – With KNUX 1604.. Use R insert



25 1016



Shank Ø / insert size	21T 25 1016	21T 25 1017	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Shim		Clamp		Screw for clamp	Spring	Set of shim pins	Pin
	Boring bar, steel								25 1016	25 1017	25 1016	25 1017				
mm	right-hand	left-hand			mm	mm	mm	mm								
25/16	eShop	eShop	A25T CKUNR/L16	KNUX 1604.. R/L	36	20.5	23	300	–	–	259038 17	259038 16	259021 3	–	259044 3	259049 4
32/16	eShop	eShop	A32U CKUNR/L16	KNUX 1604.. R/L	40	22	31	350	259031 6	259031 4	259038 17	259038 16	259021 3	259046 3	259044 3	259049 4

Garant Indexable inserts KNUX

KNUX Medium machining

NEW



Grade	HB7020-2		HB7130-2		
21G 25 1030 KNUX 160405R	eShop		eShop		10
21G 25 1032 KNUX 160405L	eShop		eShop		10
21G 25 1036 KNUX 160410R	eShop		eShop		10
21G 25 1038 KNUX 160410L	eShop		eShop		10
●	P		M		
⚙	SM		VM		
Chip breaker					
Chip diverter	mm		2.2		
a _p	mm		0.3 – 4		
f	mm/rev.		0.2 – 0.5		
v _c main application	m/min		130 – 370		
			70 – 240		



25



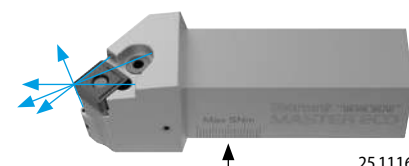
GARANT Master Eco PSSN 45° lever lock toolholder for indexable inserts SN..

Highly efficient cooling directly on the cutter and additional flank face cooling.

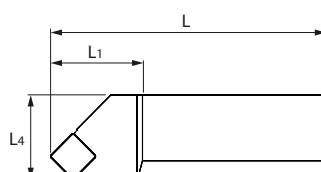
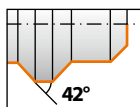
Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master eco toolholders No. 319006 – 311936 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



With flank face cooling



Positioning within the scale ensures precise coolant transfer.

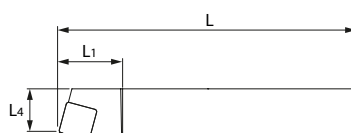
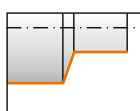


Shank / insert size	2T	25 1116	2T	25 1117	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Spring
		GARANT Master Eco lever lock toolholder short											
mm		right-hand		left-hand			mm	mm	mm				
16/12		eShop		eShop	PSSNR/L 1620X12	SN.. 1204..	25	35	85	259031 46	259015 15	259018 15	259046 4
20/12		eShop		eShop	PSSNR/L 2020X12	SN.. 1204..	25	35	95	259031 46	259015 15	259018 15	259046 4
25/12		eShop		eShop	PSSNR/L 2525X12	SN.. 1204..	32	35	105	259031 46	259015 15	259018 15	259046 4

GARANT PSBN 75° lever lock toolholder for indexable inserts SN..



25 1106

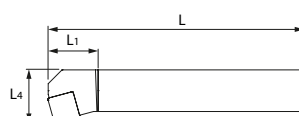
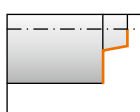


Shank / insert size	2T	25 1106	2T	25 1107	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
		Lever lock toolholder												
mm		right-hand		left-hand			mm	mm	mm					
20/12		eShop		eShop	PSBNR/L 2020K12	SN.. 1204..	17	28	125	259031 20	259015 2	259018 2	259044 2	259047 2
25/12		eShop		eShop	PSBNR/L 2525M12	SN.. 1204..	22	29	150	259031 20	259015 2	259018 2	259044 2	259047 2
25/15		eShop		eShop	PSBNR/L 2525M15	SN.. 1506..	22	32	150	259031 37	259015 12	259018 11	259044 6	259047 4
32/15		eShop		eShop	PSBNR/L 3232P15	SN.. 1506..	27	32	170	259031 37	259015 12	259018 11	259044 6	259047 4

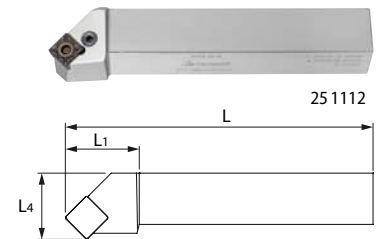
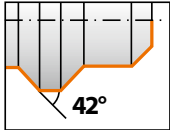
GARANT PSKN 75° lever lock toolholder for indexable inserts SN..



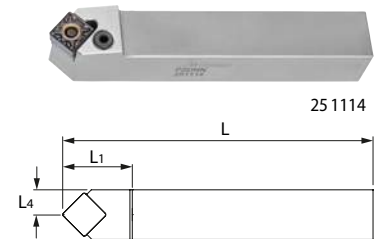
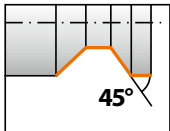
25 1110



Shank / insert size	2T	25 1110	2T	25 1111	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
		Lever lock toolholder												
mm		right-hand		left-hand			mm	mm	mm					
20/12		eShop		eShop	PSKNR/L 2020K12	SN.. 1204..	25	26	125	259031 20	259015 2	259018 2	259044 2	259047 2
25/12		eShop		eShop	PSKNR/L 2525M12	SN.. 1204..	32	26	150	259031 20	259015 2	259018 2	259044 2	259047 2
25/15		eShop		eShop	PSKNR/L 2525M15	SN.. 1506..	32	30	150	259031 37	259015 12	259018 11	259044 6	259047 4
32/15		eShop		eShop	PSKNR/L 3232P15	SN.. 1506..	40	30	170	259031 37	259015 12	259018 11	259044 6	259047 4

Garant PSSN 45° lever lock toolholder for indexable inserts SN..


Shank / insert size	21T 25 1112	21T 25 1113	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Lever lock toolholder											
mm	right-hand	left-hand			mm	mm	mm					
16/12	eShop	eShop	PSSNR/L 1616H12	SN.. 1204..	20	26	100	259031 20	259015 2	259018 2	259044 2	259047 2
20/12	eShop	eShop	PSSNR/L 2020K12	SN.. 1204..	25	29	125	259031 20	259015 2	259018 2	259044 2	259047 2
25/12	eShop	eShop	PSSNR/L 2525M12	SN.. 1204..	32	29	150	259031 20	259015 2	259018 2	259044 2	259047 2
25/15	eShop	eShop	PSSNR/L 2525M15	SN.. 1506..	32	35	150	259031 37	259015 12	259018 11	259044 6	259047 4
32/15	eShop	eShop	PSSNR/L 3232P15	SN.. 1506..	40	36	170	259031 37	259015 12	259018 11	259044 6	259047 4

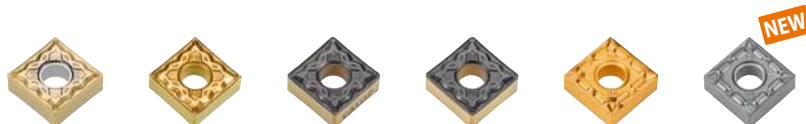

Garant PSDN 45° lever lock toolholder for indexable inserts SN..


Shank / insert size	21T 25 1114	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Lever lock toolholder										
mm	neutral			mm	mm	mm					
16/12	eShop	PSDNN 1616H12	SN.. 1204..	8.3	31	100	259031 20	259015 2	259018 2	259044 2	259047 2
20/12	eShop	PSDNN 2020K12	SN.. 1204..	10.3	28	125	259031 20	259015 2	259018 2	259044 2	259047 2
25/12	eShop	PSDNN 2525M12	SN.. 1204..	12.8	29	150	259031 20	259015 2	259018 2	259044 2	259047 2

Indexable inserts SNMG
SNMG Finishing


Grade	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7415-1	
21G 25 1142	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G 25 1144	eShop	eShop	eShop	eShop	eShop	eShop	—	10
●	P	P	P	M	M	M	S	
○	—	—	—	—	—	—	M	
⚙	●	●	●	●	●	●	●	
Chip breaker	SS	SS	SS	VS	VS	VS	TIS	
a _p	mm	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.2 – 2	
f	mm/rev.	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.2	
v _c main application	m/min	170 – 500	160 – 400	150 – 350	90 – 290	80 – 270	50 – 110	
v _c secondary application	m/min	—	—	—	—	—	70 – 250	


25



Grade		PV720	CA510	CA115P	CA125P	CA6525	PR115S	
25E 25 1162	KYOCERA SNMG 120404	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 1164	KYOCERA SNMG 120408	eShop	eShop	eShop	eShop	eShop	eShop	1
●		P	P	P	P	M	S	
⚙		●	●	●	●	●	●	
Chip breaker		PQ	PQ	PQ	PQ	MQ	MQ	
a_p	mm	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.5 – 2	0.2 – 1.5	
f	mm/rev.	0.05 – 0.3	0.13 – 0.4	0.13 – 0.4	0.13 – 0.4	0.05 – 0.25	0.04 – 0.2	
v_c main application	m/min	110 – 520	180 – 590	180 – 400	150 – 320	60 – 220	25 – 70	

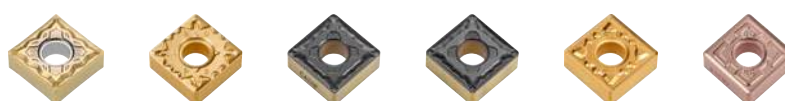


Grade		HBT020	HBT130	
22D 25 1160	HOLEX SNMG 120404	eShop	eShop	–
●		P	M	
⚙		●	●	
Chip breaker		PF	MF	
a_p	mm		0.5 – 2	
f	mm/rev.	0.1 – 0.4	0.15 – 0.45	
v_c main application	m/min	120 – 330	60 – 220	

SNM. Medium machining



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	HB7415-1	HB725-1	
21G 25 1222	SNMG 120404	eShop	eShop	eShop	eShop	eShop	eShop	–	–	–	10
21G 25 1224	SNMG 120408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G 25 1225	Garant SNMA 120408	–	–	–	–	–	–	eShop	–	–	–
21G 25 1226	SNMG 120412	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	eShop	10
21G 25 1228	SNMA 120412	–	–	–	–	–	–	eShop	–	–	–
●		P	P	P	M	M	M	K	S	UNI	
○		–	–	–	–	–	–	–	M	–	
⚙		●	●	●	●	●	●	●	●	●	
Chip breaker (25 1222, 25 1224, 25 1226)		SM	SM	SM	VM	VM	VM	GM	TIM	UM1	
a_p	mm	0.3 – 4	0.3 – 4	0.3 – 4	0.5 – 4	0.5 – 4	0.5 – 4	0.4 – 6.5	0.5 – 4	0.2 – 6	
f	mm/rev.	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.3 – 0.7	0.1 – 0.3	0.05 – 0.6	
v_c main application	m/min	140 – 440	130 – 370	120 – 320	80 – 260	70 – 240	60 – 200	100 – 450	40 – 90	50 – 250	
v_c secondary application	m/min	–	–	–	–	–	–	–	60 – 220	–	



Grade		PV720	CA510	CA115P	CA125P	CA6525	CA315	
25E 25 1253	KYOCERA SNMG 120404	–	–	–	–	eShop	–	1
25E 25 1254	KYOCERA SNMG 120408	eShop	eShop	eShop	eShop	eShop	eShop	1
●		P	P	P	P	M	O	
⚙		●	●	●	●	●	●	
Chip breaker		PG	PS	PMG	PMG	MS (brass)	KG	
a_p	mm	1 – 4	1 – 4	0.5 – 5	0.5 – 5	0.8 – 4	0.5 – 4	
f	mm/rev.	0.15 – 0.6	0.15 – 0.6	0.15 – 0.5	0.15 – 0.5	0.1 – 0.35	0.15 – 0.5	
v_c main application	m/min	110 – 490	80 – 450	180 – 400	150 – 320	60 – 220	150 – 350	



Grade		HB7020	HB7130	
22D 25 1266	HOLEX SNMG 120404	eShop	eShop	–
22D 25 1267	SNMG 120408	eShop	eShop	–
●		P	M	
⚙		PM	MM	
Chip breaker				
a_p	mm	0.8 – 5	0.5 – 5	
f	mm/rev.	0.1 – 0.45	0.12 – 0.45	
v_c main application	m/min	100 – 280	50 – 200	

SNMG Roughing



Grade		HB7020-2	HB7130-2	HB7210-1	
21G 25 1324	SNMG 120408	eShop	eShop	–	10
21G 25 1326	Garant SNMG 120412	eShop	eShop	eShop	10
21G 25 1330	SNMG 150612	eShop	eShop	eShop	10
21G 25 1332	SNMG 150616	eShop	eShop	–	10
●		P	M	K	
⚙		SG	VG	GG	
Chip breaker					
a_p	mm	1.5 – 6	1.5 – 7	0.4 – 6.5	
f	mm/rev.	0.25 – 0.6	0.2 – 0.55	0.32 – 0.8	
v_c main application	m/min	110 – 360	60 – 220	100 – 450	



Grade		CA115P	CA125P	
25E 25 1356	SNMG 120408	eShop	eShop	1
25E 25 1363	KYOCERA SNMG 150612	eShop	eShop	1
25E 25 1368	SNMG 190612	–	eShop	1
●		P	P	
⚙		●	⚙	
Chip breaker			PH	
a_p	mm		1 – 11	
f	mm/rev.		0.3 – 1	
v_c main application	m/min	170 – 380	140 – 330	



Grade		HB7020	HB7130	
22D 25 1396	HOLEX SNMG 120408	eShop	eShop	–
●		P	M	
⚙		PR	MR	
Chip breaker				
a_p	mm	1.8 – 6	2 – 6	
f	mm/rev.	0.2 – 0.6	0.15 – 0.55	
v_c main application	m/min	80 – 260	40 – 180	

SNMM Rough machining

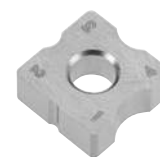


Grade		HB7020-2	HB7130-2	
21G 25 1386	SNMM 120412	eShop	eShop	10
21G 25 1390	Garant SNMM 150616	eShop	eShop	10
●		P	M	
⚙		SR	VR	
Chip breaker				
a_p	mm		2 – 10	
f	mm/rev.	0.4 – 1.2	0.3 – 0.9	
v_c main application	m/min	140 – 300	50 – 200	

MOLEX Radius turning inserts SNMX

Suitable for: eco lever lock toolholder PSSN. For example lever lock toolholders No. 251112 and 251113.

Note: The insert pocket must be modified when using indexable inserts with a radius ≥ 3 mm.



25 1398_1-4

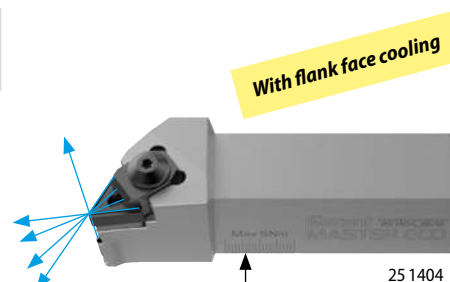
Radius			1	2	3	4	1-4
25 1398	SNMX 120408	HUT25	eShop	eShop	eShop	eShop	eShop
●			P	P	P	P	P
○			M	M	M	M	M
⚙			●	●	●	●	●
a_p	mm		1 – 4	2 – 4	3	4	1 – 4
f	mm/rev.				0.1 – 0.2		
v_c main application	m/min				50 – 120		
v_c secondary application	m/min				30 – 80		



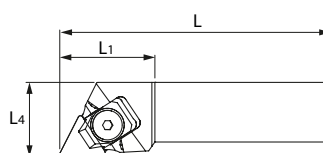
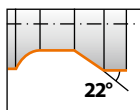
GARANT GARANT Master Eco MTJN 93° clamping toolholder for indexable inserts TN..

Highly efficient cooling directly on the cutter and additional flank face cooling.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holders No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



25 1404

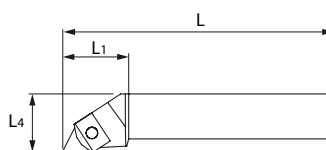
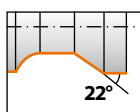


Positioning within the scale ensures precise coolant transfer.

Shank / insert size	21U	25 1404	21U	25 1405	ISO code toolholder	suitable indexable insert	L_4	L_1	L	Shim	Clamp	Screw for clamping claw	Stick
		GARANT Master Eco clamping toolholder short											
mm		right-hand		left-hand			mm	mm	mm				
20/16		eShop		eShop	MTJNR/L 2020X16	TN.. 1604..	25	35	95	259033 9	259038 20	259021 6	259049 8
25/16		eShop		eShop	MTJNR/L 2525X16	TN.. 1604..	32	35	105	259033 9	259038 20	259021 6	259049 8



GARANT MTJN 93° clamping toolholder for indexable inserts TN..

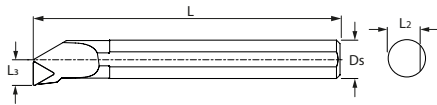
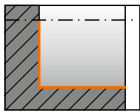


25 1406

Shank / insert size	21T	25 1406	21T	25 1407	ISO code toolholder	suitable indexable insert	L_4	L_1	L	Set of screws 10 pieces	Shim	Clamp	Stick
		Clamping toolholder											
mm		right-hand		left-hand			mm	mm	mm				
20/16		eShop		eShop	MTJNR/L 2020K16	TN.. 1604..	25	31	125	259023 2	259031 32	259038 14	259049 6
25/16		eShop		eShop	MTJNR/L 2525M16	TN.. 1604..	32	36	150	259023 2	259031 32	259038 14	259049 6
25/22		eShop		eShop	MTJNR/L 2525M22	TN.. 2204..	32	36	150	259023 2	259031 33	259038 13	259049 2
32/22		eShop		eShop	MTJNR/L 3232P22	TN.. 2204..	40	36	170	259023 2	259031 33	259038 13	259049 2

DIN
8024

Garant A... PTFN 90° boring bars for indexable inserts TN..



25 1416

Shank Ø / insert size	21T 25 1416	21T 25 1417	ISO code tool-holder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Boring bar, steel												
mm	right-hand	left-hand			mm	mm	mm	mm					
25/16	eShop	eShop	A25R PTFNR/L 16	TN.. 1604..	32	17	24	200	259031 34	259015 9	259018 6	259044 5	259047 3
32/16	eShop	eShop	A32S PTFNR/L 16	TN.. 1604..	40	22	31	250	259031 34	259015 9	259018 6	259044 5	259047 3
32/22	eShop	eShop	A32S PTFNR/L 22	TN.. 2204..	40	22	31	250	259031 10	259015 2	259018 2	259044 2	259047 2
40/22	eShop	eShop	A40T PTFNR/L 22	TN.. 2204..	50	27	38.5	300	259031 10	259015 2	259018 2	259044 2	259047 2

Indexable inserts TNM.

TNMG Finishing



Grade	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7415-1	
21G 25 1432	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G 25 1434	eShop	eShop	eShop	eShop	eShop	eShop	—	10
●	P	P	P	M	M	M	S	
○	—	—	—	—	—	—	M	
⚙	●	●	●	●	●	●	●	
Chip breaker	SS	SS	SS	VS	VS	VS	TIS	
a _p	mm	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.2 – 2	
f	mm/rev.	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.2	
v _c main application	m/min	170 – 500	160 – 400	150 – 350	90 – 290	80 – 270	50 – 110	
v _c secondary application	m/min	—	—	—	—	—	70 – 250	



Type	HB7020-2	
21G 25 1433	eShop	10
21G 25 1435	eShop	10
●	P	
⚙	⚙	
Chip breaker	WSS	
a _p	mm	0.3 – 2.5
f	mm/rev.	0.1 – 0.5
v _c main application	m/min	170 – 480



Grade	CCX	PV720	CA510	CA115P	CA125P	CA6525	PR115S	
25E 25 1472	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 1474	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
●	P	P	P	P	P	M	S	
⚙	●	●	●	●	●	●	●	
Chip breaker	PP	PQ	PQ	PQ	PQ	MQ	MQ	
a _p	mm	0.2 – 1.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.3 – 2	0.2 – 1	
f	mm/rev.	0.05 – 0.35	0.05 – 0.3	0.13 – 0.4	0.13 – 0.4	0.05 – 0.25	0.04 – 0.2	
v _c main application	m/min	210 – 450	110 – 520	180 – 590	180 – 400	150 – 320	60 – 220	



25



Grade		HBTO20	HB1130	
22D 25 1414	HOLEX TNMG 160404	eShop	eShop	—
●		P	M	
⚙		PF	MF	
Chip breaker				
a_p	mm	0.5 – 2		
f	mm/rev.	0.1 – 0.4	0.15 – 0.45	
v_c main application	m/min	120 – 330	60 – 220	

TNM. Medium machining



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	HU7305-1	HB7415-1	HB725-1	
21G 25 1542	TNMG 160404	eShop	eShop	eShop	eShop	eShop	eShop	—	eShop	—	eShop	10
21G 25 1544	Garant TNMG 160408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G 25 1546	TNMA 160408	—	—	—	—	—	—	eShop	—	—	—	—
●		P	P	P	M	M	M	K	N	S	UNI	
○		—	—	—	—	—	—	—	—	M	—	
⚙		●	●	●	●	●	●	●	●	●	●	
Chip breaker (25 1542, 25 1544)		SM	SM	SM	VM	VM	VM	GM	AM1	TIM	UM1	
a_p	mm	0.3 – 4	0.3 – 4	0.3 – 4	0.5 – 5	0.5 – 5	0.5 – 5	0.4 – 6.5	0.2 – 5	0.5 – 4	0.2 – 6	
f	mm/rev.	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.3 – 0.7	0.05 – 0.6	0.1 – 0.3	0.05 – 0.6	
v_c main application	m/min	140 – 440	130 – 370	130 – 320	80 – 260	70 – 240	60 – 200	100 – 450	400 – 700	40 – 90	50 – 250	
v_c secondary application	m/min	—	—	—	—	—	—	—	—	60 – 220	—	



Type		HB7020-2	
21G 25 1545	Garant TNMG 160408 wiper	eShop	10
●		P	
⚙		WSM	
Chip breaker			
a_p	mm	0.5 – 4	
f	mm/rev.	0.2 – 0.6	
v_c main application	m/min	140 – 420	



Grade		PV720	CA510	CA115P	CA125P	CA6525	CA315	KW10	PDL010	PR115S	SW05	
25E 25 1582	TNMG 160404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 1583	KYOCERA TNMG 160408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 1586	TNMG 220404	—	eShop	eShop	eShop	—	—	—	—	—	—	1
25E 25 1587	TNMG 220408	—	eShop	eShop	eShop	—	—	—	—	—	—	1
●		P	P	P	P	M	O	N	N	S	Ti	
⚙		●	●	●	●	●	●	●	●	●	●	
Chip breaker		PG	PS	PMG	PMG	MS	KG	AH	AH	MU	MU	
a_p	mm	1 – 4.5	1 – 4.5	0.5 – 5	0.5 – 5	0.8 – 4	0.5 – 3.6	1 – 4	1 – 3.5	0.5 – 2	0.5 – 2	
f	mm/rev.	0.15 – 0.6	0.15 – 0.6	0.15 – 0.5	0.15 – 0.5	0.1 – 0.35	0.15 – 0.5	0.1 – 0.35	0.1 – 0.4	0.09 – 0.3	0.1 – 0.35	
v_c main application	m/min	110 – 490	80 – 450	180 – 400	150 – 320	60 – 220	150 – 350	60 – 400	200 – 600	25 – 70	50 – 140	



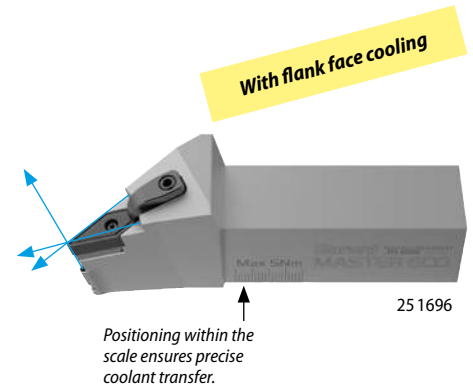
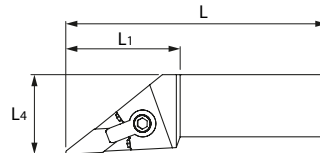
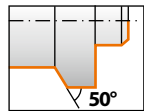
Grade		HBTO20	HB1130	
22D 25 1564	HOLEX TNMG 160404	eShop	eShop	—
22D 25 1565	TNMG 160408	eShop	eShop	—
●		P	M	
⚙		PM	MM	
Chip breaker				
a_p	mm	0.8 – 5	0.5 – 5	
f	mm/rev.	0.1 – 0.45	0.12 – 0.45	
v_c main application	m/min	100 – 280	50 – 200	



Garant GARANT Master Eco MVJN 93° clamping toolholder for indexable inserts VN..

Highly efficient cooling directly on the cutter and additional flank face cooling.

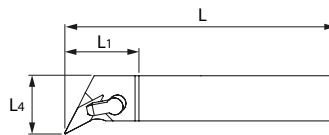
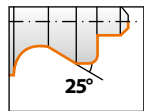
Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holders No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



Shank / insert size	21U 25 1696	21U 25 1697	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp	Screw for clamping claw
	GARANT Master Eco clamping toolholder short										
mm	right-hand	left-hand			mm	mm	mm				
20/16	eShop	eShop	MVJNR/L 2020H16	VN.. 1604..	25	40	100	259033 10	259027 7	259038 19	259021 7
25/16	eShop	eShop	MVJNR/L 2525X16	VN.. 1604..	32	40	110	259033 10	259027 7	259038 19	259021 7



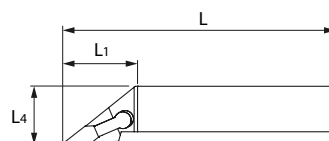
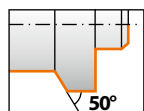
Garant MVPN 117.5° clamping toolholder for indexable inserts VN..



Shank / insert size	21T 25 1708	21T 25 1709	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp	Screw for clamping claw
	Clamping toolholder										
mm	right-hand	left-hand			mm	mm	mm				
20/16	eShop	eShop	MVPNR/L 2020K16	VN.. 1604..	25	41	125	259031 39	259025 3	259038 2	259021 1
25/16	eShop	eShop	MVPNR/L 2525M16	VN.. 1604..	32	41	150	259031 39	259025 3	259038 2	259021 1
32/16	eShop	eShop	MVPNR/L 3232P16	VN.. 1604..	40	40	170	259031 39	259025 3	259038 2	259021 1



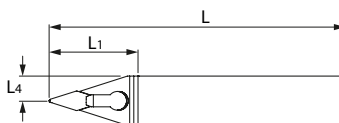
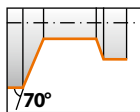
Garant MVJN 93° clamping toolholder for indexable inserts VN..



Shank / insert size	21T 25 1706	21T 25 1707	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp	Screw for clamping claw
	Clamping toolholder										
mm	right-hand	left-hand			mm	mm	mm				
20/16	eShop	eShop	MVJNR/L 2020K16	VN.. 1604..	25	32	125	259031 39	259025 3	259038 2	259021 1
25/16	eShop	eShop	MVJNR/L 2525M16	VN.. 1604..	32	32	150	259031 39	259025 3	259038 2	259021 1
32/16	eShop	eShop	MVJNR/L 3225P16	VN.. 1604..	32	32	170	259031 39	259025 3	259038 2	259021 1



25

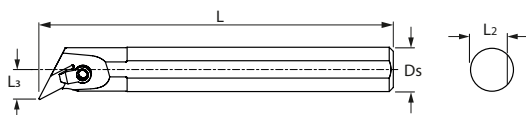
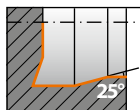

Garant MVVN clamping toolholder for indexable inserts VN..


25 1712

Shank / insert size	2T	25 1712	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp	Screw for clamping claw
		Clamping toolholder									
mm		neutral			mm	mm	mm				
20/16		eShop	MVVNN 2020K16	VN.. 1604..	10	45	125	259031 39	259025 3	259038 2	259021 1
25/16		eShop	MVVNN 2525M16	VN.. 1604..	12.5	45	150	259031 39	259025 3	259038 2	259021 1
32/16		eShop	MVVNN 3225P16	VN.. 1604..	12.5	45	170	259031 39	259025 3	259038 2	259021 1



DIN 8024

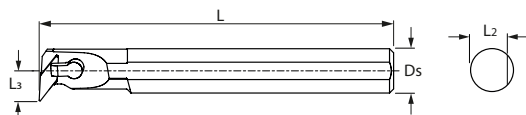
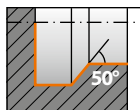

Garant A... MVPN 117.5° boring bars for indexable inserts VN..


25 1720

Shank Ø / insert size	2T	25 1720	2T	25 1721	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Shim	Shim screw	Clamp	Screw for clamp
		Boring bar, steel												
mm		right-hand		left-hand			mm	mm	mm	mm				
25/16		eShop		eShop	A25R MVPNR/L 16	VN.. 1604..	32	17	24	200	259031 39	259025 3	259038 4	259021 4
32/16		eShop		eShop	A32S MVPNR/L 16	VN.. 1604..	40	22	31	250	259031 39	259025 3	259038 2	259021 4
40/16		eShop		eShop	A40T MVPNR/L 16	VN.. 1604..	50	27	38.5	300	259031 39	259025 3	259038 2	259021 1



DIN 8024

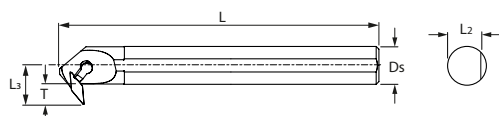
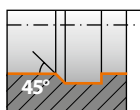

Garant A... MVUN 93° boring bars for indexable inserts VN..


25 1724

Shank Ø / insert size	2T	25 1724	2T	25 1725	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Shim	Shim screw	Clamp	Screw for clamp
		Boring bar, steel												
mm		right-hand		left-hand			mm	mm	mm	mm				
25/16		eShop		eShop	A25R MVUNR/L 16	VN.. 1604..	32	17	24	200	259031 39	259025 3	259038 4	259021 4
32/16		eShop		eShop	A32S MVUNR/L 16	VN.. 1604..	40	22	31	250	259031 39	259025 3	259038 4	259021 4
40/16		eShop		eShop	A40T MVUNR/L 16	VN.. 1604..	50	27	38.5	300	259031 39	259025 3	259038 4	259021 1



Standard


Garant A... MVZN 95° boring bars for indexable inserts VN..


25 1728

Shank Ø / insert size	2T	25 1728	2T	25 1729	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L	Shim	Shim screw	Clamp	Screw for clamp
		Boring bar, steel													
mm		right-hand		left-hand			mm	mm	mm	mm	mm				
32/16		eShop		eShop	A32S MVZNR/L 16	VN.. 1604..	48	30	31	14	250	259031 39	259025 3	259038 2	259021 4
40/16		eShop		eShop	A40T MVZNR/L 16	VN.. 1604..	57	35	38.5	15	300	259031 39	259025 3	259038 2	259021 4

VNMG indexable inserts

VNMG Finishing

Note:

25 1790/1791 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7415-1	
21G 25 1732	Garant VNMG 160404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G 25 1734	VNMG 160408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●		P	P	P	M	M	M	S	
○		—	—	—	—	—	—	M	
⚙		●	●	●	●	●	●	●	
Chip breaker		SS	SS	SS	VS	VS	VS	TIS	
a_p	mm	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.2 – 2	
f	mm/rev.	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.05 – 0.4	0.05 – 0.4	0.05 – 0.4	0.05 – 0.2	
v_c main application	m/min	170 – 500	160 – 400	150 – 350	90 – 290	80 – 270	70 – 230	50 – 110	
v_c secondary application	m/min	—	—	—	—	—	—	70 – 250	



Grade		IC8150	IC8250	IC6015	IC6025	
26B 25 1790	IsCAR VNMG 160404	—	—	—	—	10
26B 25 1791	VNMG 160408	—	—	—	—	10
●		P	P	M	M	
⚙		●	●	●	●	
Chip breaker		F3P	F3P	F3M	F3M	
a_p	mm	0.4 – 2.5	0.4 – 2.5	0.1 – 1.5	0.1 – 1.5	
f	mm/rev.	0.08 – 0.24	0.08 – 0.24	0.05 – 0.3	0.05 – 0.3	
v_c main application	m/min	180 – 400	150 – 380	140 – 300	120 – 230	



Grade		CCX	PV720	CA510	CA115P	CA125P	CA6525	PR115S	SW05	
25E 25 1752	KYOCERA VNMG 160404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 1754	VNMG 160408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
●		P	P	P	P	P	M	S	Ti	
⚙		●	●	●	●	●	●	●	●	
Chip breaker		PP	PQ	PQ	PQ	PQ	MQ	MQ	MQ	
a_p	mm	0.2 – 1.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.5 – 1.5	0.2 – 1	0.2 – 1	
f	mm/rev.	0.05 – 0.3	0.05 – 0.3	0.13 – 0.4	0.13 – 0.4	0.13 – 0.4	0.05 – 0.25	0.04 – 0.2	0.05 – 0.3	
v_c main application	m/min	210 – 450	110 – 520	180 – 590	180 – 400	150 – 320	60 – 220	25 – 70	50 – 140	



Grade		HB7020	HB7130	
22D 25 1772	HOLEX VNMG 160404	eShop	eShop	—
●		P	M	
⚙		●	●	
Chip breaker		PF	M	
a_p	mm	0.5 – 2		
f	mm/rev.	0.1 – 0.4	0.15 – 0.45	
v_c main application	m/min	120 – 330	60 – 220	

VNMG Medium machining

Note:

25 1850/1851 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HU7305-1	HB7415-1	HB725-1	
2IG 25 1802	Garant VNMG 160404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 25 1804	VNMG 160408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●		P	P	P	M	M	M	N	S	UNI	
○		–	–	–	–	–	–	–	M	–	
⚙		●	●	●	●	●	●	●	●	●	
Chip breaker		SM	SM	SM	VM	VM	VM	AM1	TIM	UM1	
a_p	mm	0.3 – 4	0.3 – 4	0.3 – 4	0.5 – 4	0.5 – 4	0.5 – 4	0.2 – 5	0.5 – 4	0.2 – 6	
f	mm/rev.	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.05 – 0.6	0.1 – 0.3	0.05 – 0.6	
v_c main application	m/min	140 – 440	130 – 370	120 – 320	80 – 260	70 – 240	60 – 200	400 – 700	40 – 90	50 – 250	
v_c secondary application	m/min	–	–	–	–	–	–	–	60 – 220	–	



Grade		IC6015	IC6025	
2GB 25 1850	VNMG 160404	–	–	10
2GB 25 1851	VNMG 160408	–	–	10
●		M	M	
⚙		●	●	
Chip breaker			M3M	
a_p	mm		0.4 – 2.5	
f	mm/rev.		0.07 – 0.3	
v_c main application	m/min	140 – 300	120 – 230	



Grade		CA6525	CA315	PR115S	SW05	
2SE 25 1824	KYOCERA VNMG 160408	eShop	eShop	eShop	eShop	1
2SE 25 1826	VNMG 160412	eShop	–	–	–	1
●		M	O	S	Ti	
⚙		●	●	●	●	
Chip breaker		MS (brass)	KG	MU	MU	
a_p	mm	0.75 – 2.5	0.5 – 3.6	0.5 – 2	0.5 – 2	
f	mm/rev.	0.1 – 0.35	0.15 – 0.45	0.1 – 0.3	0.1 – 0.35	
v_c main application	m/min	60 – 220	150 – 350	25 – 70	50 – 140	



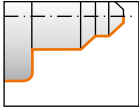
Grade		HBT020	HBT130	
22D 25 1828	HOLEX VNMG 160404	eShop	eShop	–
22D 25 1829	VNMG 160408	eShop	eShop	–
●		P	M	
⚙		●	●	
Chip breaker		PM	MM	
a_p	mm	0.8 – 4	0.5 – 4	
f	mm/rev.	0.1 – 0.45	0.12 – 0.45	
v_c main application	m/min	100 – 280	50 – 200	



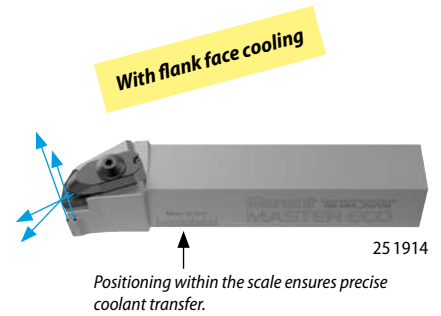
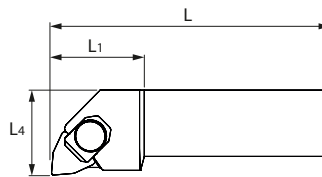
Garant GARANT Master Eco .WLN 95° clamp toolholder for indexable inserts WN..

Highly efficient cooling directly on the cutter and additional flank face cooling.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco toolholders No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.

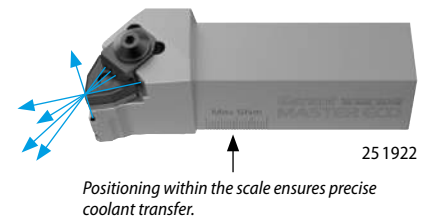
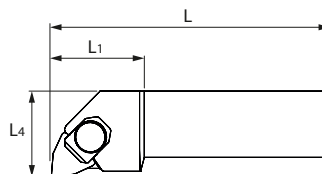


Clamping with clamp



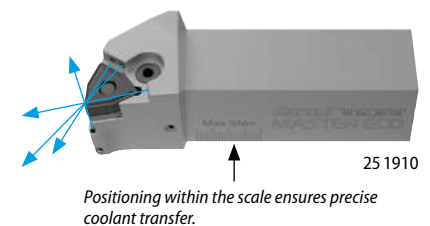
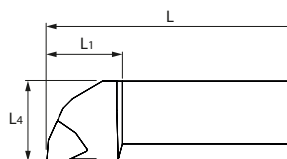
Shank / insert size	21U 25 1914	21U 25 1915	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp, screw, spring
	GARANT Master Eco clamp toolholder									
mm	right-hand	left-hand			mm	mm	mm			25 1914 25 1915
20/08	eShop	eShop	DWLNR/L 2020K08	WN.. 0804..	25	35	125	259033 6	259027 9	259036 25 259036 26
25/08	eShop	eShop	DWLNR/L 2525M08	WN.. 0804..	32	35	150	259033 6	259027 9	259036 25 259036 26

Clamping with pin and clamp



Shank / insert size	21U 25 1922	21U 25 1923	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Clamp	Screw for clamping claw	Stick
	GARANT Master Eco clamp toolholder short										
mm	right-hand	left-hand			mm	mm	mm				
20/08	eShop	eShop	MWLNR/L 2020X08	WN.. 0804..	25	35	95	259033 6	259038 18	259021 6	259049 7
25/08	eShop	eShop	MWLNR/L 2525X08	WN.. 0804..	32	35	105	259033 6	259038 18	259021 6	259049 7

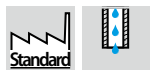
Clamping with toggle lever



Shank / insert size	21U 25 1910	21U 25 1911	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Spring
	GARANT Master Eco lever lock toolholder short										
mm	right-hand	left-hand			mm	mm	mm				
16/06	eShop	eShop	PWLNR/L 1616F06	WN.. 0604..	20	30	80	259031 47	259015 16	259018 16	259046 5
20/06	eShop	eShop	PWLNR/L 2020X06	WN.. 0604..	25	30	90	259031 47	259015 16	259018 16	259046 5
25/06	eShop	eShop	PWLNR/L 2525H06	WN.. 0604..	32	30	100	259031 47	259015 16	259018 16	259046 5
16/08	eShop	eShop	PWLNR/L 1620F08	WN.. 0804..	25	30	80	259031 48	259015 15	259018 15	259046 4
20/08	eShop	eShop	PWLNR/L 2020X08	WN.. 0804..	25	30	90	259031 48	259015 15	259018 15	259046 4
25/08	eShop	eShop	PWLNR/L 2525H08	WN.. 0804..	32	30	100	259031 48	259015 15	259018 15	259046 4



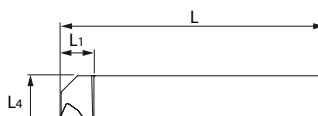
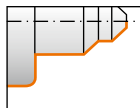
25



HOLEX Pro Eco PWLN 95° lever lock toolholder for indexable inserts WN..

Targeted cooling on the cutting edge.

Note: Coolant transfer under the head via hose connection (G1/8 inch – included in delivery).

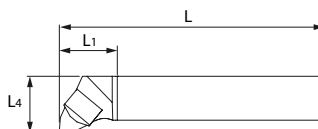
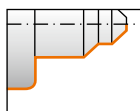


25 1924

Shank / insert size	22E 25 1924	22E 25 1925	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Pin
	HOLEX Pro Eco lever lock toolholder										
mm	right-hand	left-hand			mm	mm	mm				
20/08	eShop	eShop	PWLNLR/L 2020K08	WN.. 0804..	25	32	125	259034 3	259016 1	259019 1	259045 1
25/08	eShop	eShop	PWLNLR/L 2525M08	WN.. 0804..	32	33	150	259034 3	259016 1	259019 1	259045 1



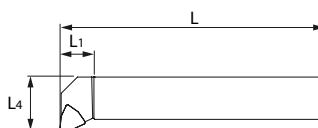
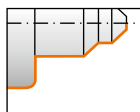
Garant MWLN 95° clamp toolholder for indexable inserts WN..



25 1912

Shank / insert size	21T 25 1912	21T 25 1913	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of screws 10 pieces	Shim	Clamp	Stick
	Clamp toolholder										
mm	right-hand	left-hand			mm	mm	mm				
20/08	eShop	eShop	MWLNLR/L 2020K08	WN.. 0804..	25	28	125	259023 2	259031 41	259038 12	259049 2
25/08	eShop	eShop	MWLNLR/L 2525M08	WN.. 0804..	32	31	150	259023 2	259031 41	259038 12	259049 2
32/08	eShop	eShop	MWLNLR/L 3232P08	WN.. 0804..	40	32	170	259023 2	259031 41	259038 12	259049 2

Garant PWLN 95° lever lock toolholder for indexable inserts WN..



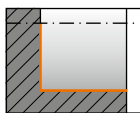
DIN ISO 5610

25 1916

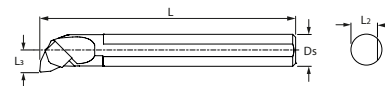
Shank / insert size	21T 25 1916	21T 25 1917	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Lever lock toolholder											
mm	right-hand	left-hand			mm	mm	mm					
16/06	eShop	eShop	PWLNLR/L 1616H06	WN.. 0604..	20	16	100	259031 25	259015 9	259018 6	259044 5	259047 3
20/06	eShop	eShop	PWLNLR/L 2020K06	WN.. 0604..	25	16	125	259031 25	259015 9	259018 6	259044 5	259047 3
25/06	eShop	eShop	PWLNLR/L 2525M06	WN.. 0604..	32	16	150	259031 25	259015 9	259018 6	259044 5	259047 3
16/08	eShop	eShop	PWLNLR/L 1616H08	WN.. 0804..	25	20	100	259031 40	259015 2	259018 2	259044 2	259047 2
20/08	eShop	eShop	PWLNLR/L 2020K08	WN.. 0804..	25	20	125	259031 40	259015 2	259018 2	259044 2	259047 2
25/08	eShop	eShop	PWLNLR/L 2525M08	WN.. 0804..	32	21	150	259031 40	259015 2	259018 2	259044 2	259047 2
32/08	eShop	eShop	PWLNLR/L 3232P08	WN.. 0804..	40	23	170	259031 40	259015 2	259018 2	259044 2	259047 2

DIN
8024

Garant A... MWLN 95° boring bars for indexable inserts WN..



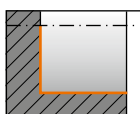
25 1936



Shank Ø / in- sert size	2TT 25 1936	2TT 25 1937	ISO code toolholder	suitable indexable in- sert	Ø D _{min}	L ₃	L ₂	L	Set of screws 10 pieces	Shim	Clamp	Stick
	Boring bar, steel											
mm	right-hand	left-hand			mm	mm	mm	mm				
25/08	eShop	eShop	A25R MWLN/L08	WN.. 0804..	32	17	24	200	259023 3	259031 41	259038 12	259049 3
32/08	eShop	eShop	A32S MWLN/L08	WN.. 0804..	40	22	31	250	259023 3	259031 41	259038 12	259049 5
40/08	eShop	eShop	A40T MWLN/L08	WN.. 0804..	50	27	38.5	300	259023 3	259031 41	259038 12	259049 5

DIN
8024

Garant A... PWLN 95° boring bars for indexable inserts WN..



25 1942



Shank Ø / in- sert size	2TT 25 1942	2TT 25 1943	ISO code toolholder	suitable indexable in- sert	Ø D _{min}	L ₃	L ₂	L	Shim	Lever	Lever screw	Set of shim pins	Shim punches pack
	Boring bar, steel												
mm	right-hand	left-hand			mm	mm	mm	mm					
16/06	eShop	eShop	A16M PWLN/L06	WN.. 0604..	21	11	15.25	150	—	259015 14	259018 10	—	—
20/06	eShop	eShop	A20Q PWLN/L06	WN.. 0604..	25	13	19	180	—	259015 14	259018 10	—	—
25/08	eShop	eShop	A25R PWLN/L08	WN.. 0804..	32	17	24	200	259031 40	259015 2	259018 8	259044 2	259047 2
32/08	eShop	eShop	A32S PWLN/L08	WN.. 0804..	40	22	31	250	259031 40	259015 2	259018 2	259044 2	259047 2

Indexable inserts WN.G

WNMG Finishing

Note:

25 1990/1991 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7415-1	
2IG 25 1952	WNMG 060404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 25 1954	WNMG 060408	eShop	eShop	eShop	eShop	eShop	eShop	—	10
2IG 25 1962	WNMG 080404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 25 1964	WNMG 080408	eShop	eShop	eShop	eShop	eShop	eShop	—	10
●		P	P	P	M	M	M	S	
○		—	—	—	—	—	—	M	
⊗		●	⊗	⊗	●	⊗	⊗	●	
Chip breaker		SS	SS	SS	VS	VS	VS	TIS	
a _p	mm	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.2 – 2	
f	mm/rev.	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.2	
v _c main application	m/min	170 – 500	160 – 400	150 – 350	90 – 290	80 – 270	70 – 230	50 – 110	
v _c secondary application	m/min	—	—	—	—	—	—	70 – 250	



25



Type		HB7020-2	
21G 25 1953	WNMG 060404 wiper	eShop	10
21G 25 1955	WNMG 060408 wiper	eShop	10
21G 25 1963	WNMG 080404 wiper	eShop	10
21G 25 1965	WNMG 080408 wiper	eShop	10
●		P	
⚙			
Chip breaker		WSS	
a _p	mm	0.3 – 2.5	
f	mm/rev.	0.1 – 0.5	
v _c main application	m/min	170 – 480	



Grade		IC8150	IC8250	IC6015	IC6025	
26B 25 1990	WNMG 080404	—	—	—	—	10
26B 25 1991	WNMG 080408	—	—	—	—	10
●		P	P	M	M	
⚙						
Chip breaker		F3P	F3P	F3M	F3M	
a _p	mm	0.4 – 2.5	0.4 – 2.5	0.1 – 1.5	0.1 – 1.5	
f	mm/rev.	0.08 – 0.25	0.08 – 0.25	0.1 – 0.4	0.1 – 0.4	
v _c main application	m/min	180 – 400	150 – 380	140 – 300	120 – 230	



Grade		CCX	PV720	CA510	CA115P	CA125P	CA6525	PR115S	SW05	
25E 25 2012	WNMG 080404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 2014	WNMG 080408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
●		P	P	P	P	P	M	S	Ti	
⚙										
Chip breaker		PP	HQ	HQ	HQ	HQ	MQ	MQ	MQ	
a _p	mm	0.2 – 1.5	0.5 – 2	0.5 – 2	0.5 – 2	0.5 – 2	0.3 – 2	0.2 – 1	0.2 – 1	
f	mm/rev.	0.05 – 0.35	0.07 – 0.3	0.07 – 0.3	0.07 – 0.3	0.07 – 0.3	0.05 – 0.25	0.04 – 0.2	0.05 – 0.3	
v _c main application	m/min	210 – 450	110 – 490	80 – 450	180 – 400	150 – 320	60 – 220	25 – 70	50 – 140	



Grade		CA510	CA115P	CA125P	
25E 25 2013	WNMG 080404 wiper	eShop	eShop	eShop	1
25E 25 2015	WNMG 080408 wiper	eShop	eShop	eShop	1
●		P	P	P	
⚙					
Chip breaker			WP		
a _p	mm		0.3 – 1.2		
f	mm/rev.		0.06 – 0.42		
v _c main application	m/min	80 – 450	180 – 400	150 – 320	



Grade		HBT020	HBT130	
22D 25 1938	WNMG 060404	eShop	eShop	—
22D 25 1939	WNMG 080404	eShop	eShop	—
●		P	M	
⚙				
Chip breaker		PF	M	
a _p	mm		0.5 – 2	
f	mm/rev.	0.1 – 0.4	0.15 – 0.45	
v _c main application	m/min	120 – 330	60 – 220	

WN.. Medium machining

Note:

25 2120/2121 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	HU7305-1	HB7415-1	HB725-1	HB730-1	
2IG 25 2062	WNMG 060404	eShop	eShop	eShop	eShop	eShop	eShop	–	eShop	–	eShop	–	10
2IG 25 2064	WNMG 060408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	10
2IG 25 2068	WNMG 080404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	eShop	–	10
2IG 25 2070	Garant WNMG 080408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 25 2076	WNMA 080408	–	–	–	–	–	–	eShop	–	–	–	–	–
2IG 25 2072	WNMG 080412	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	eShop	eShop	–	10
2IG 25 2074	WNMA 080412	–	–	–	–	–	–	eShop	–	–	–	–	–
●		P	P	P	M	M	M	K	N	S	UNI	UNI	
○		–	–	–	–	–	–	–	–	M	–	–	
⚙		●	●	●	●	●	●	●	●	●	●	●	
Chip breaker (25 2062, 25 2064, 25 2068, 25 2070, 25 2072)		SM	SM	SM	VM	VM	VM	GM	AM1	TIM	UN1	XUM	
a _p	mm	0.3 – 4	0.3 – 4	0.3 – 4	0.5 – 4	0.5 – 4	0.5 – 4	0.4 – 6.5	0.2 – 5	0.5 – 4	0.2 – 6	0.5 – 4.5	
f	mm/rev.	0.2 – 0.5	0.2 – 0.5	0.2 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.3 – 0.7	0.05 – 0.6	0.1 – 0.3	0.05 – 0.6	0.2 – 0.6	
v _c main application	m/min	140 – 440	130 – 370	120 – 320	80 – 260	70 – 240	60 – 200	100 – 450	400 – 700	40 – 90	50 – 250	35 – 230	
v _c secondary application	m/min	–	–	–	–	–	–	–	–	60 – 220	–	–	



Type		HB7020-2	
2IG 25 2065	WNMG 060408 wiper	eShop	10
2IG 25 2071	Garant WNMG 080408 wiper	eShop	10
2IG 25 2073	WNMG 080412 wiper	eShop	10
●		P	
⚙		●	
Chip breaker		WSM	
a _p	mm	0.5 – 4	
f	mm/rev.	0.2 – 0.6	
v _c main application	m/min	140 – 420	



Grade		IC8150	IC8250	IC6015	IC6025	
208 25 2120	WNMG 080404	–	–	–	–	10
208 25 2121	IsCAR WNMG 080408	–	–	–	–	10
●		P	P	M	M	
⚙		●	●	●	●	
Chip breaker		M3P	M3P	M3M	M3M	
a _p	mm	0.5 – 4				
f	mm/rev.	0.15 – 0.6	0.15 – 0.6	0.17 – 0.5	0.17 – 0.5	
v _c main application	m/min	180 – 400	150 – 380	140 – 300	120 – 230	



Grade		PV720	CA510	CA115P	CA125P	CA6525	CA315	KW10	PDL010	PR115S	SW05	
25E 25 2112	WN.G 080404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 2114	KYOCERA WN.G 080408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E 25 2116	WNMG 080412	–	eShop	eShop	eShop	eShop	eShop	–	–	–	–	1
25E 25 2118	WNMG 080416	–	eShop	eShop	eShop	–	–	–	–	–	–	1
●		P	P	P	P	M	O	N	N	S	Ti	
⚙		●	●	●	●	●	●	●	●	●	●	
Chip breaker		PG	PS	PMG	PMG	MS (brass)	KG	AH	AH	MU	MU	
Tolerance		M	M	M	M	M	M	M	G	M	M	
a _p	mm	1 – 3.8	1 – 3.8	0.5 – 5	0.5 – 5	0.8 – 4	0.5 – 4	1 – 4	1 – 3.5	0.5 – 2	0.5 – 2	
f	mm/rev.	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.1 – 0.35	0.15 – 0.5	0.1 – 0.35	0.1 – 0.4	0.09 – 0.3	0.1 – 0.35	
v _c main application	m/min	110 – 490	80 – 450	180 – 400	150 – 320	60 – 220	150 – 350	60 – 400	200 – 600	25 – 70	50 – 140	



25



Grade			CA510	CA115P	CA125P	
25E	25 2113	WNMG 080404 wiper	—	eShop	eShop	1
25E	25 2115	KYOCERA WNMG 080408 wiper	eShop	eShop	eShop	1
25E	25 2117	WNMG 080412 wiper	eShop	eShop	eShop	1
●			P	P	P	
⚙			●	●	●	
Chip breaker			WQ			
a_p		mm	0.5 – 3			
f		mm/rev.	0.14 – 0.55			
v_c main application		m/min	80 – 450	180 – 400	150 – 320	



Grade			HBTO20	HBTO20	HBTO20	HBTO20	HBTO20	HBTO20	
22D	25 2092	WNMG 060404	eShop	eShop	eShop	eShop	eShop	eShop	—
22D	25 2093	WNMG 060408	eShop	eShop	eShop	eShop	eShop	eShop	—
22D	25 2094	WNMG 080404	eShop	eShop	eShop	eShop	eShop	eShop	—
22D	25 2095	WNMG 080408	eShop	eShop	eShop	eShop	eShop	eShop	—
●			P	P	P	P	P	P	
⚙			●	●	●	●	●	●	
Chip breaker			PM			MM			
a_p		mm	0.8 – 5			0.5 – 5			
f		mm/rev.	0.1 – 0.45			0.12 – 0.45			
v_c main application		m/min	100 – 280			50 – 200			

WNMG Roughing



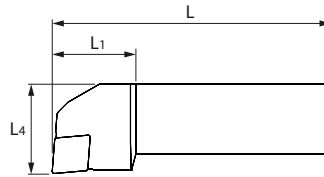
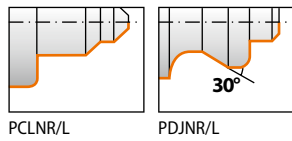
Grade			HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	
21G	25 2208	WNMG 080408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G	25 2210	WNMG 080412	eShop	eShop	eShop	eShop	eShop	eShop	—	10
●			P	P	P	M	M	M	K	
⚙			●	●	●	●	●	●	●	
Chip breaker			SG			VG			GG	
a_p		mm	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6	0.4 – 6.5	
f		mm/rev.	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.25 – 0.6	0.3 – 0.8	
v_c main application		m/min	120 – 415	110 – 360	100 – 290	70 – 240	60 – 220	50 – 170	100 – 450	



Grade			HBTO20	HBTO20	HBTO20	HBTO20	HBTO20	HBTO20	
22D	25 2224	WNMG 080408	eShop	eShop	eShop	eShop	eShop	eShop	—
22D	25 2226	WNMG 080412	eShop	eShop	eShop	eShop	eShop	eShop	—
●			P	P	P	P	P	P	
⚙			●	●	●	●	●	●	
Chip breaker			PR			MR			
a_p		mm	1.8 – 6			2 – 6			
f		mm/rev.	0.2 – 0.6			0.15 – 0.55			
v_c main application		m/min	80 – 260			40 – 180			



Lever lock toolholder sets for indexable inserts CN../DN..

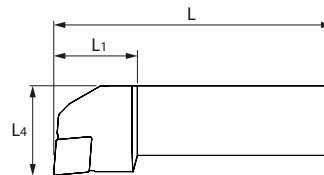
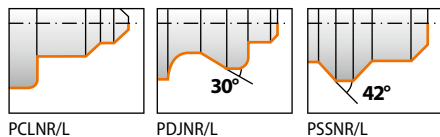


25 5120

Shank size	29W 25 5120	29W 25 5121	ISO code toolholder		suitable indexable insert	L ₄	L ₁	L	Spare part
	Lever lock toolholder set		25 5120	25 5121		mm	mm	mm	
mm	right-hand	left-hand							
16	eShop	eShop	PCLNR 1616H09; PDJNR 1616H11;	PCLNL 1616H09; PDJNL 1616H11;	CN.. 09T3..; DN.. 1104..	20	22; 25	100	259981 7
20	eShop	eShop	PCLNR 2020K12; PDJNR 2020K11;	PCLNL 2020K12; PDJNL 2020K11;	CN.. 1204..; DN.. 1104..	25	28	125	259981 8
25	eShop	eShop	PCLNR 2525M16; PDJNR 2525M15;	PCLNL 2525M16; PDJNL 2525M15;	CN.. 1606..; DN.. 1506..	32	33	150	259981 9
32	eShop	eShop	PCLNR 3232P16; PDJNR 3232P15	PCLNL 3232P16; PDJNL 3232P15	CN.. 1606..; DN.. 1506..	40	40	170	259981 9



Lever lock toolholder sets for indexable inserts CN../DN../SN..

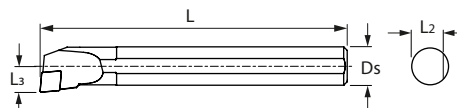
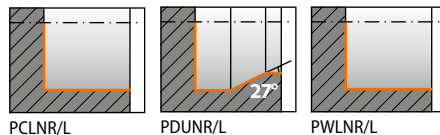


25 5130

Shank / insert size	29W 25 5130	29W 25 5131	ISO code toolholder		suitable indexable insert	L ₄	L ₁	L	Spare part
	Lever lock toolholder set		25 5130	25 5131		mm	mm	mm	
mm	right-hand	left-hand							
16	eShop	eShop	PCLNR 1616H09; PDJNR 1616H11; PSSNR 1616H12	PCLNL 1616H09; PDJNL 1616H11; PSSNL 1616H12	CN.. 09T3..; DN.. 1104..; SN.. 1204..	20	22; 25; 25	100	259981 1
20	eShop	eShop	PCLNR 2020K12; PDJNR 2020K11; PSSNR 2020K12	PCLNL 2020K12; PDJNL 2020K11; PSSNL 2020K12	CN.. 1204..; DN.. 1104..; SN.. 1204..	25	25	125	259981 2
25	eShop	eShop	PCLNR 2525M16; PDJNR 2525M15; PSSNR 2525M12	PCLNL 2525M16; PDJNL 2525M15; PSSNL 2525M12	CN.. 1606..; DN.. 1506..; SN.. 1204..	32	25	150	259981 3
32	eShop	eShop	PCLNR 3232P16; PDJNR 3232P15; PSSNR 3232P12	PCLNL 3232P16; PDJNL 3232P15; PSSNL 3232P12	CN.. 1606..; DN.. 1506..; SN.. 1204..	40	40	170	259981 3



Boring bar sets for indexable inserts CN../DN../WN..



25 5160

Type	29W 25 5160	29W 25 5161	ISO code toolholder		suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Spare part
	Boring bar set, steel, without IC		25 5160	25 5161		mm	mm	mm	mm	
	right-hand	left-hand								
1	eShop	eShop	S16R PCLNR09; S20S PDUNR11; S16M PWLNR06	S16R PCLNL09; S20S PDUNL11; S16M PWLNL06	CN.. 09T3..; DN.. 1104..; WN.. 0604..	20; 25; 20	11; 13; 11	15.25; 19; 15.25	200; 250; 150	259981 10
2	eShop	eShop	S20S PCLNR09; S25S PDUNR11; S20Q PWLNR06	S20S PCLNL09; S25S PDUNL11; S20Q PWLNL06	CN.. 09T3..; DN.. 1104..; WN.. 0604..	25; 32; 25	13; 17; 13	19; 24; 19	250; 250; 180	259981 11
3	eShop	eShop	S25S PCLNR12; S32S PDUNR15; S25R PWLNR08	S25S PCLNL12; S32S PDUNL15; S25R PWLNL08	CN.. 1204..; DN.. 1506..; WN.. 0804..	32; 40; 32	17; 22; 17	24; 31; 24	250; 250; 200	259981 12



25

Garant CBN indexable inserts


Innovative “all-in-one” concept to reduce the amount of variation in your stock levels and to give you the flexibility you need in your production.

New type of CBN with a balanced combination of wear resistance and tensile strength for general-purpose use in hardened steels up to 67 HRC in combination with a special chamfered profile.

For use both in continuous cutting and also in slightly interrupted and heavily interrupted cutting.

SIMPLE. FAST. ALWAYS THE RIGHT CHOICE.


Garant Indexable inserts CBN (0°)

25 5403–5451/5463/5466 – Fitted with 2 cutters.

25 5454/5457/5469–5481 – Fitted with 3 cutters.

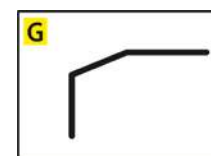
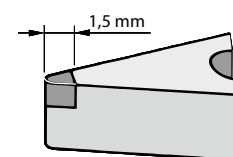
Suitable for/ v_c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si								INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N					
RII7220																						

CNGA ..

Cutting edge version	G		
21H 25 5403 CNGA 09T304	BU7220	eShop	
21H 25 5406 CNGA 09T308	BU7220	eShop	
21H 25 5409 CNGA 120404	BU7220	eShop	
21H 25 5412 CNGA 120408	BU7220	eShop	
21H 25 5418 CNGA 120412	BU7220	eShop	
21H 25 5421 CNGA 120416	BU7220	eShop	
a_p	mm	0.05 – 0.2	
f	mm/rev.	0.05 – 0.15	
v_c main application	m/min	90 – 140	



25 5412


DNGA ..

Cutting edge version	G		
21H 25 5439 DNGA 110404	BU7220	eShop	
21H 25 5442 DNGA 110408	BU7220	eShop	
21H 25 5445 DNGA 150604	BU7220	eShop	
21H 25 5448 DNGA 150608	BU7220	eShop	
21H 25 5451 DNGA 150612	BU7220	eShop	
a_p	mm	0.05 – 0.2	
f	mm/rev.	0.05 – 0.15	
v_c main application	m/min	90 – 140	



25 5445

Cutting edge (chamfered)
Chamfering generally
applicable for steel up to
67 HRC. Also for heavily
interrupted cutting.

TNGA 1604..

Cutting edge version	G		
21H 25 5454 TNGA 160404	BU7220	eShop	
21H 25 5457 TNGA 160408	BU7220	eShop	
a_p	mm	0.05 – 0.2	
f	mm/rev.	0.05 – 0.15	
v_c main application	m/min	90 – 140	



25 5454

VNGA 1604..

Cutting edge version	G		
21H 25 5463 VNGA 160404	BU7220	eShop	
21H 25 5466 VNGA 160408	BU7220	eShop	
a_p	mm	0.05 – 0.2	
f	mm/rev.	0.05 – 0.15	
v_c main application	m/min	90 – 140	



25 5466

WNGA ..

Cutting edge version	G		
21H 25 5469 WNGA 060404	BU7220	eShop	
21H 25 5472 WNGA 060408	BU7220	eShop	
21H 25 5475 WNGA 080404	BU7220	eShop	
21H 25 5478 WNGA 080408	BU7220	eShop	
21H 25 5481 WNGA 080412	BU7220	eShop	
a_p	mm	0.05 – 0.2	
f	mm/rev.	0.05 – 0.15	
v_c main application	m/min	90 – 140	



25 5475

KYOCERA Indexable inserts CBN (0°)

MEGACOAT coated CBN inserts.

Size ME – MultiEdge; 2 or 3 cutting edges per insert.

Size MET – MultiEdge Tough; 2 or 3 cutting edges per insert, with special honing for optimisation in interrupted cutting.

Size MEW – MultiEdge Wiper; 2 cutting edges per insert with wiper geometry.

Type			ME	MET	MEW
25H 25 5608	CNGA 120404	KBN05M	eShop	–	–
25H 25 5609		KBN25M	eShop	eShop	eShop
25H 25 5610		KBN35M	–	eShop	–
25H 25 5615	CNGA 120408	KBN05M	eShop	–	–
25H 25 5616		KBN25M	eShop	eShop	eShop
25H 25 5617		KBN35M	eShop	eShop	–
25H 25 5624	CNGA 120412	KBN35M	–	eShop	–
25H 25 5629	DNGA 150604	KBN05M	eShop	–	–
25H 25 5630		KBN25M	eShop	eShop	–
25H 25 5631		KBN35M	–	eShop	–
25H 25 5633	DNGA 150608	KBN05M	eShop	–	–
25H 25 5634		KBN25M	eShop	eShop	–
25H 25 5635		KBN35M	eShop	eShop	–
25H 25 5657	TNGA 160404	KBN05M	eShop	–	–
25H 25 5658		KBN25M	eShop	–	–
25H 25 5659		KBN35M	eShop	eShop	–
25H 25 5661	TNGA 160408	KBN05M	eShop	–	–
25H 25 5662		KBN25M	eShop	eShop	–
25H 25 5663		KBN35M	eShop	eShop	–
25H 25 5678	VNGA 160404	KBN25M	eShop	eShop	–
25H 25 5679	VNGA 160408	KBN35M	eShop	eShop	–
25H 25 5682		KBN25M	eShop	eShop	–
25H 25 5683		KBN35M	eShop	eShop	–
25H 25 5685	WNGA 080404	KBN05M	eShop	–	–
25H 25 5686		KBN25M	eShop	eShop	–
25H 25 5689		KBN05M	eShop	–	–
25H 25 5690	WNGA 080408	KBN25M	eShop	eShop	–
25H 25 5691		KBN35M	–	eShop	–
a _p		mm	0.05 – 0.2	0.1 – 0.3	0.05 – 0.2
f		mm/rev.	0.1 – 0.2	0.1 – 0.2	0.15 – 0.3
v _c main application		m/min	120 – 200	100 – 180	120 – 200



25 5609_ME



25 5630_ME



25 5658_ME



25 5678_ME

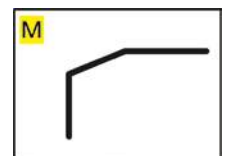
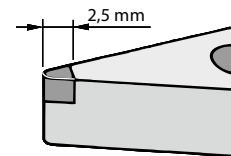


25 5686_ME

HOLEX Indexable inserts CBN (0°)

- Disposable insert.
- Single cutting edge.

Note: Further indexable insert shapes, sizes and corner radii available on request.



Cutting edge (chamfered).
Chamfering even for slightly interrupted cutting.

Cutting edge version			M
221 25 5578	CNMA 120404	BUX220	eShop
221 25 5580	CNMA 120408	BUX220	eShop
221 25 5582	CNMA 120412	BUX220	eShop
221 25 5584	DNMA 150604	BUX220	eShop
221 25 5586	DNMA 150608	BUX220	eShop
221 25 5588	DNMA 150612	BUX220	eShop
221 25 5590	TNMA 160404	BUX220	eShop
221 25 5592	TNMA 160408	BUX220	eShop
221 25 5594	TNMA 160412	BUX220	eShop
221 25 5596	VNMA 160404	BUX220	eShop
221 25 5598	VNMA 160408	BUX220	eShop
a _p (25 5578, 25 5580, 25 5582, 25 5584, 25 5586, 25 5588, 25 5590, 25 5592, 25 5594)	mm		0.1 – 0.5
a _p (25 5596, 25 5598)	mm		0.1 – 0.25
f	mm/rev.		0.1 – 0.2
v _c main application	m/min		80 – 200



25 5578



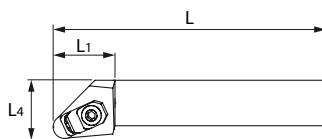
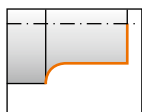
25 5584



25 5590

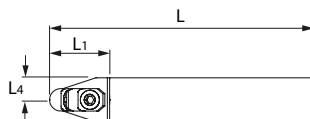
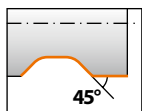


25 5596

DIN
ISO 5610**Garant CRSN 90° clamp toolholders for indexable inserts RN..**

25 5795

Shank / insert size	2IT	25 5795	2IT	25 5796	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp	Washer for clamp
		Clamp toolholder											
mm		right-hand		left-hand			mm	mm	mm				
25/12		eShop		eShop	CRSNR/L 2525M12	RN.. 1207..	32	34	150	259031 43	259025 2	259035 3	259041 1
32/12		eShop		eShop	CRSNR/L 3225P12	RN.. 1207..	32	34	170	259031 43	259025 2	259035 3	259041 1

DIN
ISO 5610**Garant CRDN 45° clamp toolholders for indexable inserts RN..**

25 5798

Shank / insert size	2IT	25 5798	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Shim	Shim screw	Clamp	Washer for clamp
		Clamp toolholder									
mm		neutral			mm	mm	mm				
25/12		eShop	CRDNN 2525M12	RN.. 1207..	12.5	34	150	259031 43	259025 2	259035 3	259041 1
32/12		eShop	CRDNN 3225P12	RN.. 1207..	12.5	34	170	259031 43	259025 2	259035 3	259041 1

Garant Indexable inserts ceramic (0°)

Application range			HART	S	
2IT	25 5770	RNGN 120700	KB7205	eShop	10
2IT	25 5774		KU7415	eShop	10
●			H	S	
○			K	—	
⚙			●	⚙	
Cutting edge version			0.1 mm×20°	0.05 mm×20°	
a _p		mm	0.1 – 0.8	0.1 – 1	
f		mm/rev.	0.05 – 0.15	0.3 – 0.5	
v _c main application		m/min	180 – 250	300	
v _c secondary application		m/min	250	—	



25 5770



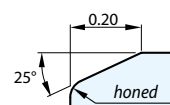
25 5774

KYOCERA Indexable inserts ceramic (0°)

MEGACOAT coated ceramic inserts.

Application range			HART	
25F	25 5870	RNGN 120700	PT600M	eShop
●			H	1
⚙			●	
Chamfer			S02025	
Cutting edge version			0.2 mm×25°	
a _p		mm	0.2 – 0.7	
f		mm/rev.	0.05 – 0.15	
v _c main application		m/min	50 – 60	
v _c secondary application		m/min	30 – 40	

Chamfering S02025



25 5870

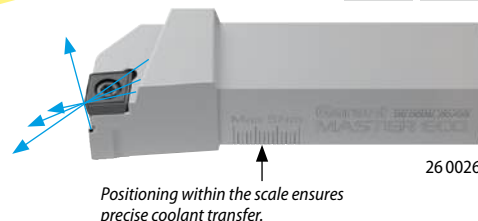
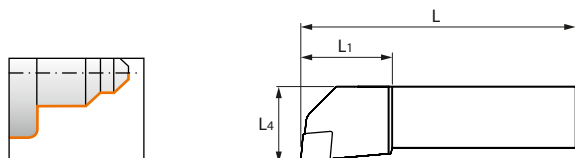


GARANT Master Eco SCLC 95° screw-on toolholder for indexable inserts CC..

Highly efficient cooling directly on the cutting edge and additional flank face cooling.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco toolholders No. 319006 – 311936 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.

With flank face cooling.



Positioning within the scale ensures precise coolant transfer.

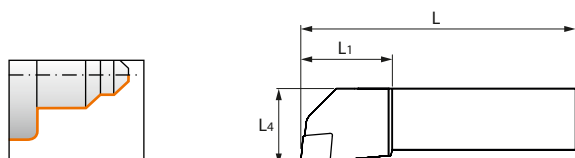
Shank / insert size	27U 26 0026	27U 26 0027	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws
	GARANT Master Eco screw-on toolholder short							
mm	right-hand	left-hand			mm	mm	mm	
16/09	eShop	eShop	SCLCR/L 1616F09	CC.. 09T3..	20	30	80	269028 28
20/09	eShop	eShop	SCLCR/L 2020X09	CC.. 09T3..	25	30	90	269028 28



HOLEX Pro Eco SCLC 95° screw-on toolholder for indexable inserts CC..

Targeted cooling on the cutting edge.

Note: Coolant transfer under the head via hose connection (G1/8 inch – included in delivery).



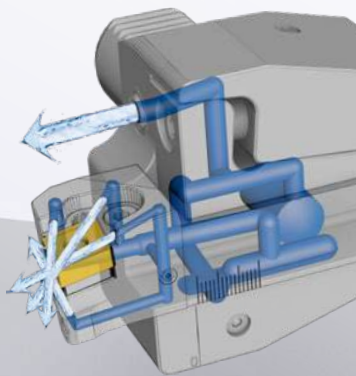
Shank / insert size	22E 26 0048	22E 26 0049	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws
	HOLEX Pro Eco screw-on toolholder							
mm	right-hand	left-hand			mm	mm	mm	
20/09	eShop	eShop	SCLCR/L 2020K09	CC.. 09T3..	25	17	125	269028 2
25/09	eShop	eShop	SCLCR/L 2525M09	CC.. 09T3..	32	19	150	269028 2

SCREW-ON TOOLHOLDER WITH THROUGH-COOLANT – DIFFERENTIATION

Garant Master

GARANT Master Eco – efficient, systematic cooling.

- Minimises heat-induced insert wear on both the rake face and the flank face.
- Variable arrangement of the VDI holder system with coolant transfer via slot at the bottom of the shank.
- Problem-solver, especially for materials with low thermal conductivity.

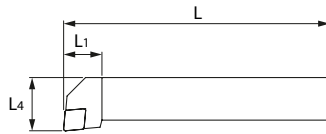
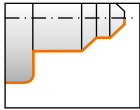


HOLEX Pro

HOLEX Pro Eco – simple and clever.

- Minimises heat-induced insert wear on the rake face.
- Coolant transfer via tubing below the head without any other peripherals.
- The smart choice for standard applications.

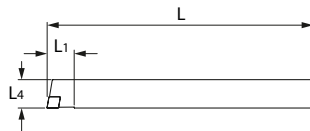
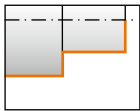


Garant SCLC 95° screw-on toolholder for indexable inserts CC..

DIN
ISO 5610

Standard

26 0006

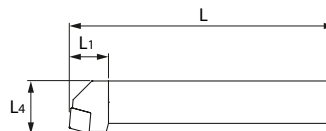
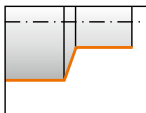
Shank / insert size	2TT 26 0006	2TT 26 0007	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder									
mm	right-hand	left-hand			mm	mm	mm			
8/06	eShop	eShop	SCLCR/L 0808D06	CC.. 0602..	10	9	60	269028 22	—	—
10/06	eShop	eShop	SCLCR/L 1010E06	CC.. 0602..	12	10	70	269028 22	—	—
12/09	eShop	eShop	SCLCR/L 1212F09	CC.. 09T3..	16	13	80	269028 2	—	—
16/09	eShop	eShop	SCLCR/L 1616H09	CC.. 09T3..	20	17	100	269028 2	269005 1	269013 2
20/09	eShop	eShop	SCLCR/L 2020K09	CC.. 09T3..	25	17	125	269028 2	269005 1	269013 2
25/09	eShop	eShop	SCLCR/L 2525M09	CC.. 09T3..	32	19	150	269028 2	269005 1	269013 2
16/12	eShop	eShop	SCLCR/L 1616H12	CC.. 1204..	20	20	100	269028 20	269005 6	269013 5
20/12	eShop	eShop	SCLCR/L 2020K12	CC.. 1204..	25	20	125	269028 20	269005 6	269013 5
25/12	eShop	eShop	SCLCR/L 2525M12	CC.. 1204..	32	20	150	269028 20	269005 6	269013 5

Garant SCAC 90° screw-on toolholder for indexable inserts CC..

DIN
ISO 5610

Standard

26 0014

Shank / insert size	2TT 26 0014	2TT 26 0015	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws
	Screw-on toolholder							
mm	right-hand	left-hand			mm	mm	mm	
8/06	eShop	eShop	SCACR/L 0808M06	CC.. 0602..	8	8	150	269021 1
10/06	eShop	eShop	SCACR/L 1010M06	CC.. 0602..	10	10	150	269021 1
12/06	eShop	eShop	SCACR/L 1212M06	CC.. 0602..	12	12	150	269021 1
16/06	eShop	eShop	SCACR/L 1616M06	CC.. 0602..	16	16	150	269021 1
12/09	eShop	eShop	SCACR/L 1212M09	CC.. 09T3..	12	12	150	269021 2
16/09	eShop	eShop	SCACR/L 1616M09	CC.. 09T3..	16	16	150	269021 2

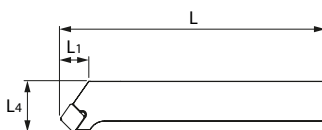
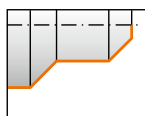

Garant SCRC 75° screw-on toolholder for indexable inserts CC..


26 0004

Shank / insert size	2TT 26 0004	2TT 26 0005	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder									
mm	right-hand	left-hand			mm	mm	mm			
8/06	eShop	eShop	SCRCR/L 0808D06	CC.. 0602..	9	10	60	269028 22	—	—
10/06	eShop	eShop	SCRCR/L 1010E06	CC.. 0602..	11	10	70	269028 22	—	—
12/09	eShop	eShop	SCRCR/L 1212F09	CC.. 09T3..	13	15	80	269028 8	—	—
16/09	eShop	eShop	SCRCR/L 1616H09	CC.. 09T3..	17	15	100	269028 2	269005 1	269013 2
20/09	eShop	eShop	SCRCR/L 2020K09	CC.. 09T3..	22	18	125	269028 2	269005 1	269013 2
16/12	eShop	eShop	SCRCR/L 1616H12	CC.. 1204..	17	20	100	269028 16	269005 6	269013 5
20/12	eShop	eShop	SCRCR/L 2020K12	CC.. 1204..	22	20	125	269028 16	269005 6	269013 5
25/12	eShop	eShop	SCRCR/L 2525M12	CC.. 1204..	27	20	150	269028 16	269005 6	269013 5



26

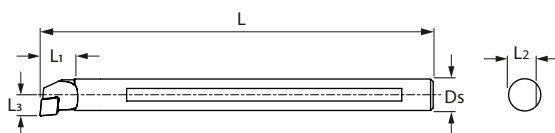
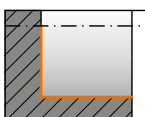
Garant SCSC 45° screw-on toolholder for indexable inserts CC..


26 0000

Shank / insert size	2T 26 0000	2T 26 0001	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder									
mm	right-hand	left-hand			mm	mm	mm			
8/06	eShop	eShop	SCSCR/L 0808D06	CC.. 0602..	10	12	60	269028 22	—	—
10/06	eShop	eShop	SCSCR/L 1010E06	CC.. 0602..	12	12	70	269028 22	—	—
12/09	eShop	eShop	SCSCR/L 1212F09	CC.. 09T3..	16	19	80	269028 2	—	—
16/09	eShop	eShop	SCSCR/L 1616H09	CC.. 09T3..	20	20	101	269028 2	269005 1	269013 2
20/09	eShop	eShop	SCSCR/L 2020K09	CC.. 09T3..	25	22	126	269028 2	269005 1	269013 2
16/12	eShop	eShop	SCSCR/L 1616H12	CC.. 1204..	20	22	101	269028 20	269005 6	269013 5
20/12	eShop	eShop	SCSCR/L 2020K12	CC.. 1204..	25	24	126	269028 20	269005 6	269013 5
25/12	eShop	eShop	SCSCR/L 2525M12	CC.. 1204..	32	27	151	269028 20	269005 6	269013 5



Carbide


Garant E... SCLC 95° boring bars for indexable inserts CC..


26 0016

Shank Ø / insert size	2T 26 0016	2T 26 0017	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	Boring bar carbide									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
4/03	eShop	eShop	E04G SCLCR/L03	CC.. 0301..	5	2.5	3.8	10	90	269028 13
5/03	eShop	eShop	E05H SCLCR/L03	CC.. 0301..	6	3	4.8	10	100	269028 19
6/03	eShop	eShop	E06J SCLCR/L03	CC.. 0301..	7	3.5	5.8	10	110	269028 19
8/06	eShop	eShop	E08K SCLCR/L06	CC.. 0602..	10	5	7.6	10	125	269028 7
10/06	eShop	eShop	E10K SCLCR/L06	CC.. 0602..	12	6	9.6	10	125	269028 7
12/06	eShop	eShop	E12M SCLCR/L06	CC.. 0602..	14	8	11.5	10	150	269028 7
16/09	eShop	eShop	E16R SCLCR/L09	CC.. 09T3..	18	10	15.5	16	200	269028 8
20/09	eShop	eShop	E20S SCLCR/L09	CC.. 09T3..	23	12	19	16	250	269028 8
25/12	eShop	eShop	E25S SCLCR/L12	CC.. 1204..	30	15	24	16	250	269028 8



Carbide

DIN 8024


Garant E... SCLC 95° boring bar sets for indexable inserts CC..


26 0018

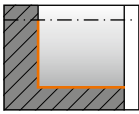
29W 26 0018	29W 26 0019	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
Boring bar set carbide								
right-hand	left-hand			mm	mm	mm	mm	
eShop	eShop	E08K SCLCR/L06; E10K SCLCR/L06; E12M SCLCR/L06	CC.. 0602..	10; 12; 14	5; 6; 8	7.6; 9.6; 11.5	125; 125; 150	269028 7



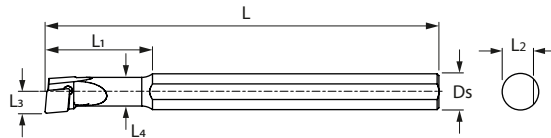
HSS



Garant AH... SCLC 95° boring bars for indexable inserts CC..



Boring bar stepped



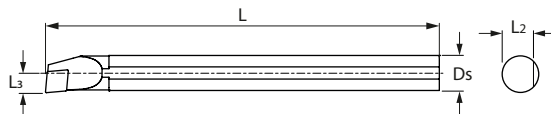
26 0022_1012/06



Shank Ø / insert size	2T 26 0022	2T 26 0023	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
mm	right-hand	left-hand	mm			mm	mm	mm	mm	mm	mm	
0410/03	eShop	eShop	10	AH0410H SCLCR/L03	CC.. 0301..	5	2.5	9	4	24	100	269028 13
0610/03	eShop	eShop	10	AH0610H SCLCR/L03	CC.. 0301..	7	2.5	9	6	24	100	269028 13
0608/06	eShop	eShop	8	AH0608H SCLCR/L06	CC.. 0602..	8	4	7	6	25	100	269028 7
0810/06	eShop	eShop	10	AH0810J SCLCR/L06	CC.. 0602..	12	6	9	8	32	110	269028 7
1012/06	eShop	eShop	12	AH1012K SCLCR/L06	CC.. 0602..	14	7	11	10	38	125	269028 7
1216/06	eShop	eShop	16	AH1216M SCLCR/L06	CC.. 0602..	18	9	15	12	50	150	269028 7

Boring bar cylindrical

DIN 8024



26 0022_20/09



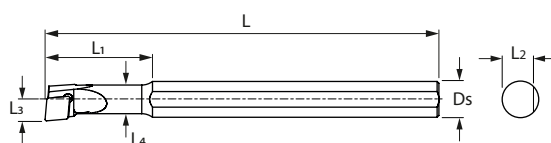
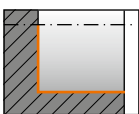
Shank Ø / insert size	2T 26 0022	2T 26 0023	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
mm	right-hand	left-hand	mm			mm	mm	mm	mm	
8/06	eShop	eShop	8	AH08K SCLCR/L06	CC.. 0602..	10	5	7	125	269028 7
10/06	eShop	eShop	10	AH10K SCLCR/L06	CC.. 0602..	12	6	9	125	269028 7
12/06	eShop	eShop	12	AH12M SCLCR/L06	CC.. 0602..	14	7	11	150	269028 7
16/09	eShop	eShop	16	AH16Q SCLCR/L09	CC.. 09T3..	18	11	15	180	269028 8
20/09	eShop	eShop	20	AH20R SCLCR/L09	CC.. 09T3..	23	13	18	200	269028 8
25/12	eShop	eShop	25	AH25R SCLCR/L12	CC.. 1204..	28	15.5	23	200	269028 9



HSS



Garant AH... SCLC 95° boring bar sets for indexable inserts CC..



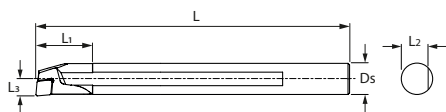
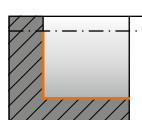
26 0024



29W 26 0024	29W 26 0025	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L	L ₁	Set of insert screws
right-hand	left-hand			mm	mm	mm	mm	mm	mm	
eShop	eShop	AH0608H SCLCR/L06; AH0810J SCLCR/L06; AH1012K SCLCR/L06; AH1216M SCLCR/L06	CC.. 0602..	8; 12; 14; 18	4; 6; 7; 9	7; 9; 11; 15	6; 8; 10; 12	100; 110; 125; 150	25; 32; 38; 50	269028 7

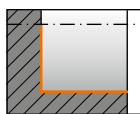
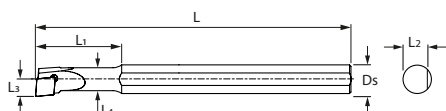


26


Garant GARANT Master Turn A... SCLC 95° boring bars for indexable inserts CC..
DIN
8024

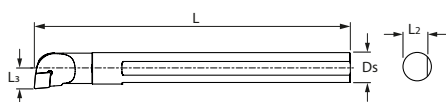
26 0030

Shank Ø / insert size	2T 26 0030	2T 26 0031	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	right-hand	left-hand								
mm					mm	mm	mm	mm	mm	
8/06	eShop	eShop	A08H SCLCR/L06	CC.. 0602..	10	5	7	20	100	269028 7
10/06	eShop	eShop	A10K SCLCR/L06	CC.. 0602..	12	6	9	20	125	269028 7
12/06	eShop	eShop	A12L SCLCR/L06	CC.. 0602..	14	7	11	24.3	140	269028 7
16/09	eShop	eShop	A16Q SCLCR/L09	CC.. 09T3..	18	9	15	31	180	269028 8
20/09	eShop	eShop	A20R SCLCR/L09	CC.. 09T3..	22	11	18	36	200	269028 8
25/09	eShop	eShop	A25R SCLCR/L09	CC.. 09T3..	27	13.5	23	43	200	269028 8
25/12	eShop	eShop	A25R SCLCR/L12	CC.. 1204..	27	13.5	23	43	200	269028 9


Garant A... SCLC 95° boring bars for indexable inserts CC..

Boring bar stepped


26 0032_1012/06

Shank Ø / insert size	2T 26 0032	2T 26 0033	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
	right-hand	left-hand										
mm			mm			mm	mm	mm	mm	mm	mm	
0608/06	eShop	eShop	8	A0608H SCLCR/L06	CC.. 0602..	8	4.2	7	6	21.5	100	269028 7
0810/06	eShop	eShop	10	A0810J SCLCR/L06	CC.. 0602..	11	6	9	8	27	110	269028 7
1012/06	eShop	eShop	12	A1012K SCLCR/L06	CC.. 0602..	13	6.9	11	10	32.5	125	269028 7
1216/06	eShop	eShop	16	A1216M SCLCR/L06	CC.. 0602..	16	8.9	15	12	42	150	269028 7

Boring bar cylindrical
DIN
8024

26 0032_25/12

Shank Ø / insert size	2T 26 0032	2T 26 0033	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws	Shim	Shim screw
	right-hand	left-hand										
mm			mm			mm	mm	mm	mm			
8/06	eShop	eShop	8	A08H SCLCR/L06	CC.. 0602..	10	6	7	100	269028 7	—	—
10/06	eShop	eShop	10	A10K SCLCR/L06	CC.. 0602..	12	7	9	125	269028 22	—	—
12/06	eShop	eShop	12	A12L SCLCR/L06	CC.. 0602..	16	9	11	140	269028 22	—	—
16/09	eShop	eShop	16	A16Q SCLCR/L09	CC.. 09T3..	20	11	14	180	269028 8	—	—
20/09	eShop	eShop	20	A20R SCLCR/L09	CC.. 09T3..	25	13	18	200	269028 8	—	—
25/12	eShop	eShop	25	A25R SCLCR/L12	CC.. 1204..	30	17	24	200	269028 9	—	—
32/12	eShop	eShop	32	A32S SCLCR/L12	CC.. 1204..	40	22	31	250	269028 20	269005 6	269013 5
40/12	eShop	eShop	40	A40T SCLCR/L12	CC.. 1204..	49	27	38.5	300	269028 20	269005 6	269013 5

HOLEX SCLC 95° boring bar sets for indexable inserts CC..

26 0389/0038 – Without through-coolant feed.

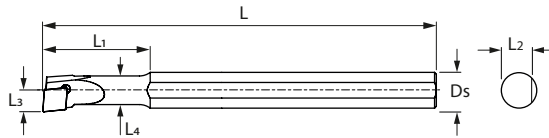
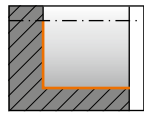
Supplied with:

Size SET09 – Plastic case

Size SET06 – Plastic case



26 0036_SET06



Type	29W 26 0389			ISO code toolholder		suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
	Boring bar set, carbide, without IC right-hand						mm	mm	mm	mm	mm	mm	
SET06	eShop			C08K SCLCR 06; C10K SCLCR 06; C12M SCLCR 06		CC.. 0602..	10; 12; 14	5; 6; 8	7.6; 9.6; 11.5	6; 8; 10	22; 27; 33	125; 125; 150	269028 7

Type	29W 26 0036	29W 26 0037	29W 26 0038	ISO code toolholder		suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
	Boring bar set, steel, with IC right-hand		Boring bar set, steel, without IC left-hand	26 0036 26 0037	26 0038		mm	mm	mm	mm	mm	mm	
SET06	eShop	eShop	eShop	A0608H SCLCR/L06; A0810J SCLCR/L06; A1012K SCLCR/L06; A1216M SCLCR/L06	S0608H SCLCR06; S0810J SCLCR06; S1012K SCLCR06; S1216M SCLCR06	CC.. 0602..	8; 11; 13; 17	4; 6; 7; 9	7; 9; 11; 15	6; 8; 10; 12	22; 27; 33; 42	100; 110; 125; 150	269028 7
SET09	eShop	eShop	eShop	A16Q SCLCR/L09; A20R SCLCR/L09; A25R SCLCR/L09	S16Q SCLCR09; S20R SCLCR09; S25R SCLCR09	CC.. 09T3..	20; 25; 28	10.7; 10.5; 14.5	15; 18; 23	— — —	— — —	180; 200; 200	269028 8

CC.T indexable inserts
CCGT Fine finishing


Grade	HB7025-1	HB7125-1	HU7315-1	
211 26 0046	eShop	eShop	eShop	–
211 26 0047	eShop	eShop	eShop	–
●	P	M	N	
⚙	SF	VF	AF	
Chip breaker	SF	VF	AF	
a_p	mm	0.05 – 0.2	0.05 – 0.2	0.05 – 0.5
f	mm/rev.	0.03 – 0.1	0.03 – 0.1	0.03 – 0.1
v_c main application	m/min	120 – 300	120 – 300	120 – 600



Grade	PR1725	PR1535	
25E 26 0040	eShop	eShop	1
25E 26 0041	eShop	eShop	1
●	P	M	
○	M	S	
⚙	MP-CF	MFP-PF	
Chip breaker	MP-CF	MFP-PF	
a_p	mm	0.03 – 0.2	
f	mm/rev.	0.02 – 0.1	
v_c main application	m/min	60 – 180	70 – 160
v_c secondary application	m/min	100 – 150	40 – 60



26

CC.T Finishing

Note:

26 0089–0103 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade			CU7010	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HU7315-1	HB7315-1	HB7415-1	
2IG 26 0050	Garant	CC.T 060202	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–
2IG 26 0052		CC.T 060204	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–
2IG 26 0056		CC.T 09T302	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–
2IG 26 0058		CC.T 09T304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–
2IG 26 0060		CCMT 09T308	–	eShop	eShop	eShop	eShop	eShop	eShop	–	–	eShop	10
2IG 26 0062		CCGT 120402	–	–	–	–	–	–	–	eShop	eShop	–	–
2IG 26 0064		CC.T 120404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–
2IG 26 0066		CCMT 120408	–	eShop	eShop	eShop	eShop	eShop	eShop	–	–	eShop	10
●			P	P	P	P	M	M	M	N	N	S	
○			M	–	–	–	–	–	–	–	–	M	
⊗			●	●	●	●	●	●	●	●	●	●	
Chip breaker			SS	SS	SS	SS	VS	VS	VS	AF	AF	TIS	
Tolerance			M	M	M	M	M	M	M	G	G	M	
a_p		mm	0.2 – 2.5	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.2 – 2.5	0.2 – 2.5	0.2 – 2.5	0.05 – 0.5	0.05 – 0.5	0.2 – 1.5	
f		mm/rev.	0.05 – 0.25	0.07 – 0.25	0.07 – 0.25	0.07 – 0.25	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.03 – 0.1	0.03 – 0.1	0.05 – 0.3	
v_c main application		m/min	90 – 210	150 – 500	140 – 400	120 – 350	90 – 290	80 – 270	70 – 230	120 – 600	120 – 600	50 – 110	
v_c secondary application		m/min	80 – 140	–	–	–	–	–	–	–	–	70 – 250	



Type			HB7020-2	
2IG 26 0051	Garant	CCMT 060202 wiper	eShop	10
2IG 26 0053		CCMT 060204 wiper	eShop	10
2IG 26 0057		CCMT 09T302 wiper	eShop	10
2IG 26 0059		CCMT 09T304 wiper	eShop	10
●			P	
⊗			●	
Chip breaker			WSS	
a_p		mm	0.2 – 2.5	
f		mm/rev.	0.06 – 0.5	
v_c main application		m/min	150 – 460	



Grade			IC807	
26B 26 0089	Isenhardt	CCMT 09T302	–	10
26B 26 0102		CCMT 09T304	–	10
●			P	
⊗			●	
Chip breaker			F3P	
a_p		mm	0.1 – 2	
f		mm/rev.	0.06 – 0.25	
v_c main application		m/min	50 – 245	



Grade			IC807	
26B 26 0101	Isenhardt	CCMT 09T302	–	10
26B 26 0103		CCMT 09T304	–	10
●			M	
⊗			●	
Chip breaker			F3M	
a_p		mm	0.1 – 2	
f		mm/rev.	0.06 – 0.25	
v_c main application		m/min	30 – 80	



Grade		SP4019	
28D	26 0070	CCGT 060200	eShop 10
28D	26 0071	CCGT 060201	eShop 10
28D	26 0072	CCGT 060202	eShop 10
28D	26 0073	CCGT 060204	eShop 10
28D	26 0075	CCGT 09T300	eShop 10
28D	26 0076	CCGT 09T301	eShop 10
28D	26 0077	CCGT 09T302	eShop 10
28D	26 0078	CCGT 09T304	eShop 10
28D	26 0079	CCGT 09T308	eShop 10
●		UNI	
⚙		●	
Chip breaker		62	
a_p	mm	0.15 – 3	
f	mm/rev.	0.05 – 0.3	
v_c main application	m/min	30 – 440	



Grade		CCX	PV720	CA510	CA115P	CA125P	PR1725	CA6525	PDL010	SW05	
25E	26 0090	CCGT 060201	–	–	–	–	eShop	–	–	–	1
25E	26 0091	CC.T 060202	eShop	eShop	eShop	eShop	eShop	–	eShop	–	1
25E	26 0092	CC.T 060204	eShop	eShop	eShop	eShop	–	–	eShop	–	1
25E	26 0095	CCGT 09T301	–	–	–	–	eShop	–	–	–	1
25E	26 0096	CC.T 09T302	eShop	eShop	–	eShop	eShop	–	eShop	–	1
25E	26 0097	CC.T 09T304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E	26 0098	CCMT 09T308	eShop	eShop	eShop	eShop	eShop	–	–	eShop	1
●		P	P	P	P	P	M	M	N	Ti	
○		–	–	–	–	–	P	–	–	–	
⚙		●	●	●	●	●	●	●	●	●	
Chip breaker		PP	HQ	HQ	HQ	HQ	MFP-SKS	MQ	AP	MQ	
Tolerance		M	M	M	M	M	G	M	G	M	
a_p	mm	0.1 – 0.8	0.5 – 2.5	0.5 – 2.5	0.5 – 2.5	0.5 – 2.5	0.2 – 1.5	0.5 – 2.5	0.1 – 1	0.1 – 1	
f	mm/rev.	0.05 – 0.3	0.05 – 0.25	0.05 – 0.25	0.05 – 0.25	0.05 – 0.25	0.03 – 0.2	0.05 – 0.2	0.05 – 0.25	0.05 – 0.2	
v_c main application	m/min	120 – 310	60 – 270	140 – 450	90 – 270	60 – 180	60 – 200	50 – 140	100 – 400	40 – 100	
v_c secondary application	m/min	–	–	–	–	–	50 – 150	–	–	–	



Grade		PV720	CA510	CA115P	CA125P	PR1725	
25E	26 0093	CCMT 060202 wiper	eShop	eShop	eShop	eShop	1
25E	26 0094	CCMT 060204 wiper	eShop	eShop	eShop	eShop	1
25E	26 0099	CCMT 09T304 wiper	eShop	eShop	eShop	eShop	1
25E	26 0100	CCMT 09T308 wiper	eShop	eShop	eShop	eShop	1
●		P	P	P	P	M	
○		–	–	–	–	P	
⚙		●	●	●	●	●	
Chip breaker		WP					
a_p	mm	0.5 – 2.5	0.5 – 2.5	0.1 – 1.5	0.1 – 1.5	0.2 – 1.5	
f	mm/rev.	0.05 – 0.25	0.05 – 0.25	0.07 – 0.5	0.07 – 0.5	0.03 – 0.2	
v_c main application	m/min	60 – 270	140 – 450	120 – 270	90 – 180	60 – 200	
v_c secondary application	m/min	–	–	–	–	50 – 150	

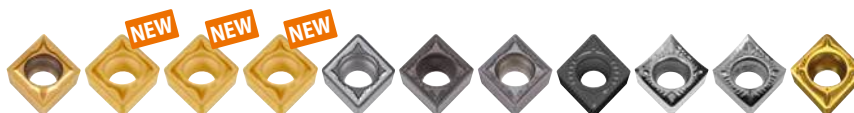


Grade		HBTO20	HBT130	
22D	26 0082	CCMT 060202	eShop	—
22D	26 0084	CCMT 060204	eShop	—
22D	26 0086	CCMT 09T304	eShop	—
22D	26 0088	CCMT 120404	eShop	—
		P	M	
Chip breaker		PF	M	
a_p	mm	0.4 – 2	0.1 – 1	
f	mm/rev.	0.1 – 0.3	0.05 – 0.2	
v_c main application	m/min	120 – 330	60 – 220	

CC.T Medium machining

Note:

26 0170–0173 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade		CB7010	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	HU7310	HB7310	HB725-1	
21G	26 0140	—	eShop	eShop	eShop	eShop	eShop	eShop	—	eShop	eShop	—	10
21G	26 0142	—	eShop	eShop	eShop	eShop	eShop	eShop	—	eShop	eShop	eShop	10
21G	26 0148	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	eShop	eShop	—	—
21G	26 0150	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—
21G	26 0152	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G	26 0156	—	—	—	—	—	—	—	—	eShop	eShop	—	—
21G	26 0158	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	eShop	eShop	eShop	—
21G	26 0160	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
		P	P	P	P	M	M	M	K	N	N	UNI	
		M	—	—	—	—	—	—	—	—	—	—	
Chip breaker		SM	SM	SM	SM	VM	VM	VM	GM	AM	AM	UM1	
Tolerance		M	M	M	M	M	M	M	M	G	G	M	
a_p	mm	0.2 – 4	0.3 – 2	0.3 – 2	0.3 – 2	0.2 – 4	0.2 – 4	0.2 – 4	0.2 – 2.5	0.1 – 4	0.1 – 4	0.2 – 4	
f	mm/rev.	0.1 – 0.3	0.08 – 0.3	0.08 – 0.3	0.08 – 0.3	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.25	0.05 – 0.5	0.05 – 0.5	0.05 – 0.5	
v_c main application	m/min	90 – 240	120 – 440	110 – 350	80 – 290	80 – 260	70 – 240	60 – 200	100 – 450	350 – 600	350 – 600	50 – 250	
v_c secondary application	m/min	70 – 180	—	—	—	—	—	—	—	—	—	—	



Type		HB7020-2	
21G	26 0143	CCMT 060204 wiper	eShop
21G	26 0151	CCMT 09T304 wiper	eShop
21G	26 0153	CCMT 09T308 wiper	eShop
21G	26 0159	CCMT 120404 wiper	eShop
21G	26 0161	CCMT 120408 wiper	eShop
		P	
Chip breaker		WSM	
a_p	mm	0.4 – 2.5	
f	mm/rev.	0.1 – 0.35	
v_c main application	m/min	120 – 410	



Grade			IC807	
26B	26 0170	CCMT 09T304	—	10
26B	26 0172	CCMT 09T308	—	10
●			P	
⚙			M3P	
Chip breaker			M3P	
a_p		mm	0.5 – 4	
f		mm/rev.	0.08 – 0.3	
v_c main application		m/min	50 – 245	



Grade			IC807	
26B	26 0171	CCMT 09T304	—	10
26B	26 0173	CCMT 09T308	—	10
●			M	
⚙			M3M	
Chip breaker			M3M	
a_p		mm	0.5 – 4	
f		mm/rev.	0.08 – 0.3	
v_c main application		m/min	30 – 80	



Grade			SP4019	
28A	26 0180	CCMT 060202	eShop	10
28A	26 0181	CCMT 060204	eShop	10
28A	26 0182	CCMT 060208	eShop	10
28A	26 0184	CCMT 09T304	eShop	10
28A	26 0185	CCMT 09T308	eShop	10
28A	26 0187	CCMT 120404	eShop	10
28A	26 0188	CCMT 120408	eShop	10
●			UNI	
⚙			73	
Chip breaker			73	
a_p		mm	0.2 – 5	
f		mm/rev.	0.1 – 0.45	
v_c main application		m/min	30 – 440	



Grade			PV720	CA510	CA115P	CA125P	CA6525	CA315	KW10	
25E	26 0190	CCMT 060202	eShop	eShop	eShop	eShop	eShop	—	—	1
25E	26 0192	CCMT 060202	eShop	eShop	eShop	eShop	eShop	eShop	—	1
25E	26 0194	CCMT 09T302	eShop	—	eShop	eShop	eShop	—	—	1
25E	26 0196	CC.T 09T304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E	26 0202	CCMT 120404	eShop	eShop	eShop	eShop	eShop	eShop	—	1
25E	26 0204	CCMT 120408	eShop	eShop	eShop	eShop	eShop	eShop	—	1
25E	26 0206	CCMT 120412	—	eShop	eShop	eShop	eShop	—	—	1
●			P	P	P	P	M	O	N	
⚙			GK	GK	GK	GK	GK	GK	AH	
Chip breaker			GK	GK	GK	GK	GK	GK	AH	
Tolerance			M	M	M	M	M	M	G	
a_p		mm	0.5 – 3							
f		mm/rev.	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.05 – 0.25	
v_c main application		m/min	60 – 270	140 – 450	90 – 340	60 – 260	50 – 140	60 – 230	30 – 300	



Grade			HBT020	HBT130	
22D	26 0210	CCMT 060204	eShop	eShop	—
22D	26 0211	CCMT 09T304	eShop	eShop	—
22D	26 0213	CCMT 09T308	eShop	eShop	—
22D	26 0219	CCMT 120404	eShop	eShop	—
22D	26 0221	CCMT 120408	eShop	eShop	—
●			P	M	
⚙			PM	MM	
Chip breaker			PM	MM	
a_p		mm	0.5 – 2.5	0.3 – 3	
f		mm/rev.	0.12 – 0.3	0.05 – 0.35	
v_c main application		m/min	100 – 280	50 – 200	



GARANT Master Eco SDJC 93° screw-on toolholder for indexable inserts DC..

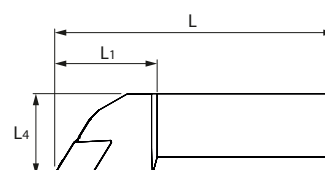
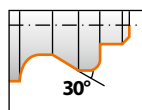
Highly efficient cooling directly on the cutting edge and additional flank face cooling.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holder No. 319006 – 311936 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



Positioning within the scale ensures precise coolant transfer.

With flank face cooling



Shank / insert size	21U 26 0292	21U 26 0293	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	GARANT Master Eco screw-on toolholder									
mm	right-hand	left-hand			mm	mm	mm			
16/11	eShop	eShop	SDJCR/L 1616H11	DC.. 11T3..	20	30	100	269023 3	269007 1	269013 6
20/11	eShop	eShop	SDJCR/L 2020K11	DC.. 11T3..	25	30	125	269023 3	269007 1	269013 7
25/11	eShop	eShop	SDJCR/L 2525M11	DC.. 11T3..	32	30	150	269023 3	269007 1	269013 7

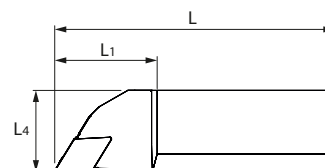
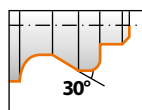
Shank / insert size	21U 26 0290	21U 26 0291	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	GARANT Master Eco screw-on toolholder short									
mm	right-hand	left-hand			mm	mm	mm			
16/11	eShop	eShop	SDJCR/L 1616F11	DC.. 11T3..	20	30	80	269023 3	269007 1	269013 6
20/11	eShop	eShop	SDJCR/L 2020X11	DC.. 11T3..	25	30	90	269023 3	269007 1	269013 7
25/11	eShop	eShop	SDJCR/L 2525H11	DC.. 11T3..	32	30	100	269023 3	269007 1	269013 7



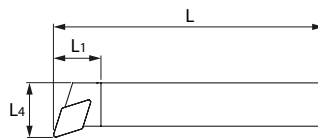
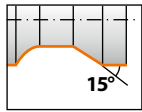
HOLEX Pro Eco SDJC 93° screw-on toolholder for indexable inserts DC..

Targeted cooling on the cutting edge.

Note: Coolant transfer under the head via hose connection (G1/8 inch – included in delivery).

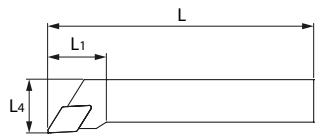
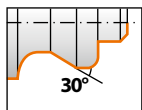


Shank / insert size	22E 26 0304	22E 26 0305	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws
	HOLEX Pro Eco screw-on toolholder							
mm	right-hand	left-hand			mm	mm	mm	
20/11	eShop	eShop	SDJCR/L 2020K11	DC.. 11T3..	25	20.5	125	269028 2
25/11	eShop	eShop	SDJCR/L 2525M11	DC.. 11T3..	32	21.5	150	269028 2

Garant SDHC 107.5° screw-on toolholder for indexable inserts DC..


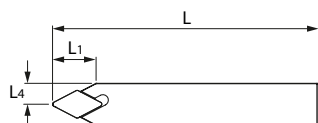
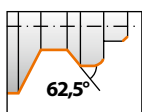
260306

Shank / insert size	2T	26 0306	2T	26 0307	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder											
	mm	right-hand		left-hand			mm	mm	mm			
10/07		eShop		eShop	SDHCR/L 1010E07	DC.. 0702..	12	7	70	269028 22	—	—
12/07		eShop		eShop	SDHCR/L 1212F07	DC.. 0702..	16	12	80	269028 22	—	—
16/11		eShop		eShop	SDHCR/L 1616H11	DC.. 11T3..	20	12	100	269028 2	269005 3	269013 2
20/11		eShop		eShop	SDHCR/L 2020K11	DC.. 11T3..	25	15	125	269028 2	269005 3	269013 2
25/11		eShop		eShop	SDHCR/L 2525M11	DC.. 11T3..	32	21	150	269028 2	269005 3	269013 2

Garant SDJC 93° screw-on toolholder for indexable inserts DC..


260308

Shank / insert size	2T	26 0308	2T	26 0309	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder											
mm		right-hand		left-hand			mm	mm	mm			
8/07		eShop		eShop	SDJCR/L 0808D07	DC.. 0702..	10	13	60	269028 22	—	—
10/07		eShop		eShop	SDJCR/L 1010E07	DC.. 0702..	12	13	70	269028 22	—	—
12/07		eShop		eShop	SDJCR/L 1212F07	DC.. 0702..	16	17	80	269028 22	—	—
16/07		eShop		eShop	SDJCR/L 1616H07	DC.. 0702..	20	22	100	269028 22	—	—
20/07		eShop		eShop	SDJCR/L 2020K07	DC.. 0702..	24	24	125	269028 22	—	—
16/11		eShop		eShop	SDJCR/L 1616H11	DC.. 11T3..	20	20	100	269028 2	269005 3	269013 2
20/11		eShop		eShop	SDJCR/L 2020K11	DC.. 11T3..	25	20.5	125	269028 2	269005 3	269013 2
25/11		eShop		eShop	SDJCR/L 2525M11	DC.. 11T3..	32	21.5	150	269028 2	269005 3	269013 2

Garant SDNC 62.5° screw-on toolholder for indexable inserts DC..


260300

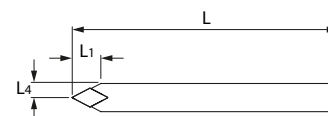
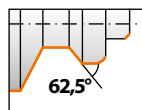
Shank / insert size	2T	26 0300	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder				mm	mm	mm			
mm		neutral			mm	mm	mm			
8/07		eShop	SDNCN 0808D07	DC.. 0702..	4	7.5	60	269028 22	—	—
10/07		eShop	SDNCN 1010E07	DC.. 0702..	5	9.5	70	269028 22	—	—
12/07		eShop	SDNCN 1212F07	DC.. 0702..	6	11	80	269028 22	—	—
16/11		eShop	SDNCN 1616H11	DC.. 11T3..	8	16	100	269028 2	269005 3	269013 2
20/11		eShop	SDNCN 2020K11	DC.. 11T3..	10	20	125	269028 2	269005 3	269013 2
25/11		eShop	SDNCN 2525M11	DC.. 11T3..	12.5	25	150	269028 2	269005 3	269013 2



26

Garant SDNC 62.5° screw-on toolholder for indexable inserts DC..

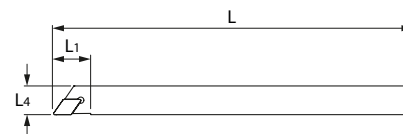
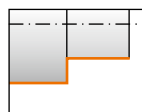

26 0301



Shank / insert size	2T	26 0301	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws
		Screw-on toolholder						
mm		neutral			mm	mm	mm	
10/07		eShop	SDNCN 1010M07	DC.. 0702..	5.2	15	150	269021 1
12/11		eShop	SDNCN 1212M11	DC.. 11T3..	6.2	21	150	269021 2
16/11		eShop	SDNCN 1616M11	DC.. 11T3..	8.6	21	150	269021 2


Garant SDAC 90° screw-on toolholder for indexable inserts DC..

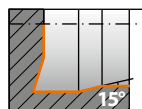

26 0298



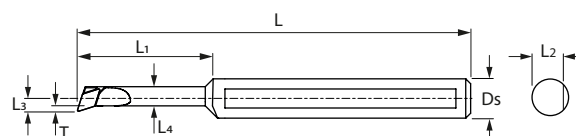
Shank / insert size	2T	26 0298	2T	26 0299	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws
		Screw-on toolholder								
mm		right-hand		left-hand			mm	mm	mm	
8/07		eShop		eShop	SDACR/L 0808M07	DC.. 0702..	8	12.7	150	269021 1
10/07		eShop		eShop	SDACR/L 1010M07	DC.. 0702..	10	15	150	269021 1
12/07		eShop		eShop	SDACR/L 1212M07	DC.. 0702..	12	15	150	269021 1
16/07		eShop		eShop	SDACR/L 1616M07	DC.. 0702..	16	16	150	269021 1
12/11		eShop		eShop	SDACR/L 1212M11	DC.. 11T3..	12	18	150	269021 2
16/11		eShop		eShop	SDACR/L 1616M11	DC.. 11T3..	16	20	150	269021 2



Carbide

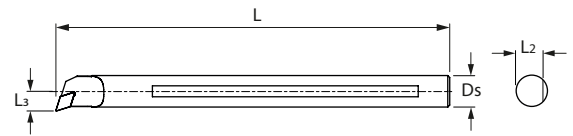

Garant E... SDQC 107.5° boring bars for indexable inserts DC..


26 0320_0408/04



Shank Ø / insert size	2T	26 0320	2T	26 0321	Ø D ₅	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
		Boring bar carbide													
mm		right-hand		left-hand	mm			mm	mm	mm	mm	mm	mm	mm	
0408/04		eShop		eShop	8	E0408F SDQCR/L04	DC.. 04T0..	5.6	3	7.5	1.1	4	26	80	269028 26

Boring bar cylindrical

DIN
8024

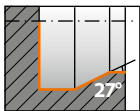
Shank $\varnothing$ / insert size	2IT 26 0320	2IT 26 0321	$\varnothing D_s$	ISO code toolholder	suitable indexable insert	$\varnothing D_{min}$	L_3	L_2	L	Set of insert screws
	Boring bar carbide									
mm	right-hand	left-hand	mm			mm	mm	mm	mm	
8/07	eShop	eShop	8	E08K SDQCR/L07	DC.. 0702..	12	7	7.6	125	269028 7
10/07	eShop	eShop	10	E10K SDQCR/L07	DC.. 0702..	13	7	9.6	125	269028 7
12/07	eShop	eShop	12	E12M SDQCR/L07	DC.. 0702..	16	8.5	11.6	150	269028 7
16/07	eShop	eShop	16	E16R SDQCR/L07	DC.. 0702..	20	10	15.6	200	269028 7
20/11	eShop	eShop	20	E20S SDQCR/L11	DC.. 11T3..	25	12.5	18.9	250	269028 8
25/11	eShop	eShop	25	E25S SDQCR/L11	DC.. 11T3..	32	16	24	250	269028 8



Carbide



Garant E... SDUC 93° boring bars for indexable inserts DC..

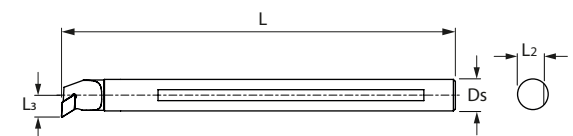


Boring bar stepped



Shank $\varnothing$ / insert size	2IT 26 0318	2IT 26 0319	$\varnothing D_s$	ISO code toolholder	suitable indexable insert	$\varnothing D_{min}$	L_3	L_2	T	L_4	L_1	L	Set of insert screws
	Boring bar carbide												
mm	right-hand	left-hand	mm			mm	mm	mm	mm	mm	mm	mm	
0408/04	eShop	eShop	8	E0408F SDUCR/L04	DC.. 04T0..	5.6	3	7.5	1.5	4	26	80	269028 26

Boring bar cylindrical

DIN
8024

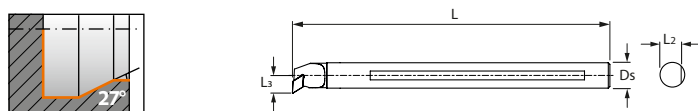
Shank $\varnothing$ / insert size	2IT 26 0318	2IT 26 0319	$\varnothing D_s$	ISO code toolholder	suitable indexable insert	$\varnothing D_{min}$	L_3	L_2	L	Set of insert screws
	Boring bar carbide									
mm	right-hand	left-hand	mm			mm	mm	mm	mm	
8/07	eShop	eShop	8	E08K SDUCR/L07	DC.. 0702..	12.5	7.5	7.6	125	269028 7
10/07	eShop	eShop	10	E10K SDUCR/L07	DC.. 0702..	12.5	7	9.6	125	269028 7
12/07	eShop	eShop	12	E12M SDUCR/L07	DC.. 0702..	15	9	11.6	150	269028 7
16/07	eShop	eShop	16	E16R SDUCR/L07	DC.. 0702..	19	11	15.6	200	269028 7
20/11	eShop	eShop	20	E20S SDUCR/L11	DC.. 11T3..	23.5	13.1	18.9	250	269028 8
25/11	eShop	eShop	25	E25S SDUCR/L11	DC.. 11T3..	32	16	24	250	269028 8



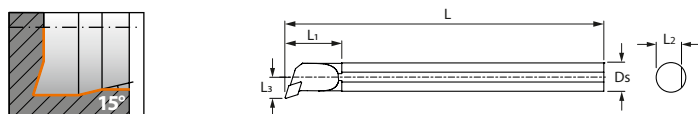
26


Garant E... SDUC 93° boring bar sets for indexable inserts DC..


26 0324

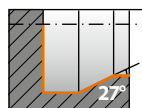
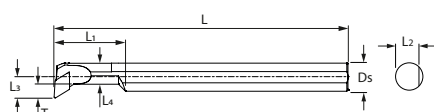


29W	26 0324	29W	26 0325	ISO code toolholder	suitable indexable insert	$\varnothing D_{min}$	L_3	L_2	L	Set of insert screws
Boring bar set carbide										
	right-hand		left-hand			mm	mm	mm	mm	
	eShop		eShop	E10K SDUCR/L07; E12M SDUCR/L07	DC.. 0702..	12; 15	7; 9	9.6; 11.6	125; 150	269028 7


Garant AH... SDQC 107.5° boring bars for indexable inserts DC..


26 0328

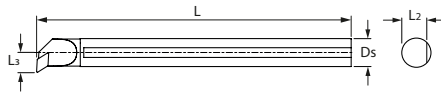
Shank $\varnothing$ / insert size	21T	26 0328	21T	26 0329	ISO code toolholder	suitable indexable insert	$\varnothing D_{min}$	L_3	L_2	L_1	L	Set of insert screws
Boring bar HSS												
mm		right-hand		left-hand			mm	mm	mm	mm	mm	
8/07		eShop		eShop	AH08K SDQCR/L07	DC.. 0702..	12	8	7	20	125	269028 7
10/07		eShop		eShop	AH10K SDQCR/L07	DC.. 0702..	13	8	9	20	125	269028 7
12/07		eShop		eShop	AH12M SDQCR/L07	DC.. 0702..	16	9.5	11	20	150	269028 7
16/07		eShop		eShop	AH16Q SDQCR/L07	DC.. 0702..	20	12	15	30	180	269028 7
20/11		eShop		eShop	AH20R SDQCR/L11	DC.. 11T3..	25	14.5	18	40	200	269028 8
25/11		eShop		eShop	AH25R SDQCR/L11	DC.. 11T3..	32	17	23	40	200	269028 8


Garant AH... SDUC 93° boring bars for indexable inserts DC..

Boring bar stepped


260332_0810/07

Shank $\varnothing$ / insert size	21T	26 0332	21T	26 0333	$\varnothing D_s$	ISO code toolholder	suitable indexable insert	$\varnothing D_{min}$	L_3	L_2	T	L_4	L_1	L	Set of insert screws
Boring bar HSS															
mm		right-hand		left-hand	mm			mm	mm	mm	mm	mm	mm	mm	
0810/07		eShop		eShop	10	AH0810H SDUCR/L07	DC.. 0702..	12.5	7	9	5	8	22	100	269028 7
1012/07		eShop		eShop	12	AH1012K SDUCR/L07	DC.. 0702..	15.5	9	11	5	10	28	125	269028 7
1216/07		eShop		eShop	16	AH1216M SDUCR/L07	DC.. 0702..	19.5	11	15	5	12	36	150	269028 7

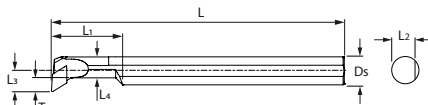
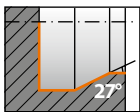
Boring bar cylindrical



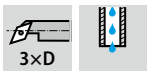
Shank Ø / insert size	21T 26 0332	21T 26 0333	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
	Boring bar HSS									
mm	right-hand	left-hand	mm			mm	mm	mm	mm	
8/07	eShop	eShop	8	AH08K SDUCR/L07	DC.. 0702..	13.5	7.5	7	125	269028 7
10/07	eShop	eShop	10	AH10K SDUCR/L07	DC.. 0702..	14	9	9	125	269028 7
12/07	eShop	eShop	12	AH12M SDUCR/L07	DC.. 0702..	16	8	11	150	269028 7
16/07	eShop	eShop	16	AH16Q SDUCR/L07	DC.. 0702..	20	10	15	180	269028 7
20/11	eShop	eShop	20	AH20R SDUCR/L11	DC.. 11T3..	26	16	18	200	269028 8
25/11	eShop	eShop	25	AH25R SDUCR/L11	DC.. 11T3..	32	16	23	200	269028 8



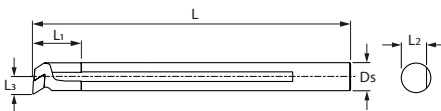
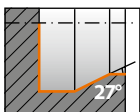
Garant AH... SDUC 93° boring bar sets for indexable inserts DC..



29W 26 0334	29W 26 0335	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
Boring bar set HSS											
right-hand	left-hand			mm	mm	mm	mm	mm	mm	mm	
eShop	eShop	AH0810H SDUCR/L07; AH1012K SDUCR/L07; AH1216M SDUCR/L07	DC.. 0702..	12.5; 15.5; 19.5	7; 9; 11	9; 11; 15	5; 5; 5	8; 10; 12	22; 28; 36	100; 125; 150	269028 7



Garant Master Turn A... SDUC 93° boring bars for indexable inserts DC..



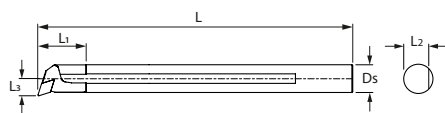
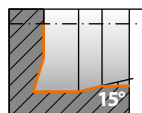
optimised
chip evacuation



Shank Ø / insert size	21T 26 0336	21T 26 0337	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	GARANT Master Turn boring bar, steel spiral flutes									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
10/07	eShop	eShop	A10K SDUCR/L07	DC.. 0702..	13	7	9	20	125	269028 7
12/07	eShop	eShop	A12L SDUCR/L07	DC.. 0702..	15	8	11	25	140	269028 7
16/07	eShop	eShop	A16Q SDUCR/L07	DC.. 0702..	19	10	15	28	180	269028 7
16/11	eShop	eShop	A16Q SDUCR/L11	DC.. 11T3..	23	14	15	28	180	269028 8
20/11	eShop	eShop	A20R SDUCR/L11	DC.. 11T3..	25	13	18	36	200	269028 8
25/11	eShop	eShop	A25R SDUCR/L11	DC.. 11T3..	31	16	23	40	200	269028 8

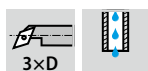
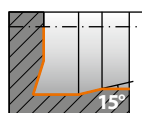
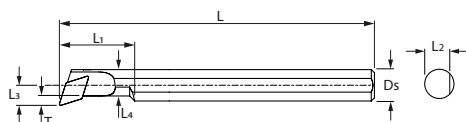


26


Garant GARANT Master Turn A... SDQC 107.5° boring bars for indexable inserts DC..


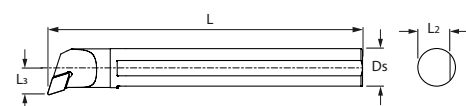
26 0330

Shank Ø / insert size	2IT 26 0330	2IT 26 0331	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	GARANT Master Turn boring bar, steel spiral flutes									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
10/07	eShop	eShop	A10K SDQCR/L07	DC.. 0702..	13	7	9	20	125	269028 7
12/07	eShop	eShop	A12L SDQCR/L07	DC.. 0702..	15	8	11	25	140	269028 7
16/07	eShop	eShop	A16Q SDQCR/L07	DC.. 0702..	19	10	15	28	180	269028 7
16/11	eShop	eShop	A16Q SDQCR/L11	DC.. 11T3..	23	14	15	28	180	269028 8
20/11	eShop	eShop	A20R SDQCR/L11	DC.. 11T3..	25	13	18	36	200	269028 8
25/11	eShop	eShop	A25R SDQCR/L11	DC.. 11T3..	31	16	23	40	200	269028 8


Garant A... SDQC 107.5° boring bars for indexable inserts DC..

Boring bar stepped


26 0340_0408/04

Shank Ø / insert size	2IT 26 0340	2IT 26 0341	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar, steel												
mm	right-hand	left-hand	mm			mm	mm	mm	mm	mm	mm	mm	
0408/04	eShop	eShop	8	A0408F SDQCR/L04	DC.. 04T0..	5.2	2.6	7.5	1.1	4	15	80	269028 26
0810/07	eShop	eShop	10	A0810H SDQCR/L07	DC.. 0702..	12.5	6.4	9	3	8.4	22.4	100	269028 7
1012/07	eShop	eShop	12	A1012K SDQCR/L07	DC.. 0702..	15.5	9	11	4	10.7	27.5	125	269028 7
1216/07	eShop	eShop	16	A1216M SDQCR/L07	DC.. 0702..	19.5	11	15	5	12	39.5	150	269028 7

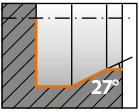
Boring bar cylindrical


26 0340_25/11

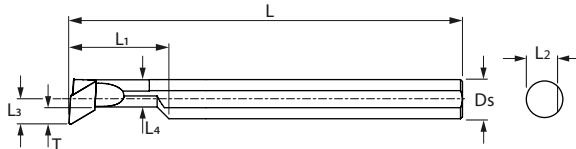
Shank Ø / insert size	2IT 26 0340	2IT 26 0341	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws	Shim	Shim screw
	Boring bar, steel											
mm	right-hand	left-hand	mm			mm	mm	mm	mm			
10/07	eShop	eShop	10	A10K SDQCR/L07	DC.. 0702..	14	7	9	125	269028 7	—	—
12/07	eShop	eShop	12	A12L SDQCR/L07	DC.. 0702..	17	9	11	140	269028 7	—	—
16/07	eShop	eShop	16	A16Q SDQCR/L07	DC.. 0702..	22	11	14	180	269028 7	—	—
20/11	eShop	eShop	20	A20R SDQCR/L11	DC.. 11T3..	26	13	18	200	269028 8	—	—
25/11	eShop	eShop	25	A25R SDQCR/L11	DC.. 11T3..	32.5	17	24	200	269028 8	—	—
32/11	eShop	eShop	32	A32S SDQCR/L11	DC.. 11T3..	44	22	31	250	269028 2	269005 3	269013 2
40/11	eShop	eShop	40	A40T SDQCR/L11	DC.. 11T3..	49	27	39	300	269028 2	269005 3	269013 2



Garant A... SDUC 93° boring bars for indexable inserts DC..



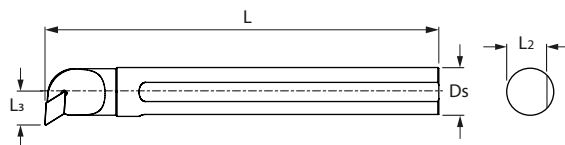
Boring bar stepped



260342_0810/07

Shank Ø / insert size	2IT 26 0342	2IT 26 0343	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar steel												
mm	right-hand	left-hand	mm			mm	mm	mm	mm	mm	mm	mm	
0408/04	eShop	eShop	8	A0408F SDUCR/L04	DC.. 04T0..	5.2	3	7.5	1.5	4	15	80	269028 26
0810/07	eShop	eShop	10	A0810H SDUCR/L07	DC.. 0702..	12.5	6.5	9	4.4	7	22.5	100	269028 7
1012/07	eShop	eShop	12	A1012K SDUCR/L07	DC.. 0702..	15.5	9	11	5.9	9	27.5	125	269028 7
1216/07	eShop	eShop	16	A1216M SDUCR/L07	DC.. 0702..	18	11	15	4.9	12	40.5	150	269028 7

Boring bar cylindrical



DIN 8024

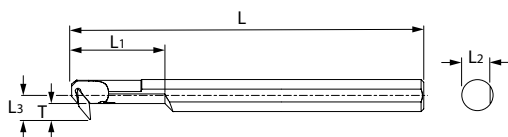
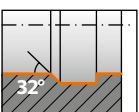


260342_25/11

Shank Ø / insert size	2IT 26 0342	2IT 26 0343	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws	Shim	Shim screw
	Boring bar steel											
mm	right-hand	left-hand	mm			mm	mm	mm	mm			
10/07	eShop	eShop	10	A10K SDUCR/L07	DC.. 0702..	13.5	7	9	125	269028 7	—	—
12/07	eShop	eShop	12	A12L SDUCR/L07	DC.. 0702..	16	9	11	140	269028 7	—	—
16/07	eShop	eShop	16	A16Q SDUCR/L07	DC.. 0702..	20	11	14	180	269028 7	—	—
20/11	eShop	eShop	20	A20R SDUCR/L11	DC.. 11T3..	25	13	18	200	269028 8	—	—
25/11	eShop	eShop	25	A25R SDUCR/L11	DC.. 11T3..	32	17	24	200	269028 8	—	—
32/11	eShop	eShop	32	A32S SDUCR/L11	DC.. 11T3..	40	22	31	250	269028 2	269005 3	269013 2
40/11	eShop	eShop	40	A40T SDUCR/L11	DC.. 11T3..	49	27	39	300	269028 2	269005 3	269013 2



Garant A... SDXC 93° boring bars for indexable inserts DC..



260344

DIN 8024



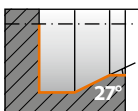
26

Shank Ø / insert size	2IT 26 0344	2IT 26 0345	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₁	L	Set of insert screws
	Boring bar, steel										
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	
8/04	eShop	eShop	A08F SDXCR/L04	DC.. 04T0..	9.2	5	7.5	3	15	80	269028 26
10/04	eShop	eShop	A10H SDXCR/L04	DC.. 04T0..	12.5	7	9	5	22	100	269028 26
12/07	eShop	eShop	A12L SDXCR/L07	DC.. 0702..	17	9	11	4.3	25	140	269028 7
16/07	eShop	eShop	A16Q SDXCR/L07	DC.. 0702..	21	11	15	4.3	33	180	269028 7
20/11	eShop	eShop	A20R SDXCR/L11	DC.. 11T3..	25	13	18	10	40	200	269028 8
25/11	eShop	eShop	A25R SDXCR/L11	DC.. 11T3..	31.5	17	23	10	50	200	269028 8



SDUC 93° boring bar sets for indexable inserts DC..

26 0348 – Without through-coolant feed.



DIN
8024

Standard



26 0346

Type	29W 26 0346	29W 26 0347	29W 26 0348	ISO code toolholder		suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
	Boring bar set, steel, with IC		Boring bar set, steel, without IC	26 0346 26 0347	26 0348		mm	mm	mm	mm	mm	mm	
	right-hand	left-hand	right-hand										
SET07	eShop	eShop	eShop	A0810H SDUCR/L07; A1012K SDUCR/L07; A1216M SDUCR/L07	S0810H SDUCR07; S1012K SDUCR07; S1216M SDUCR07	DC..0702..	12; 15.5; 19	6.5; 9; 11	9; 11; 15	8; 10; 12	22.5; 27.5; 40.5	100; 125; 150	269028 7
SET11	eShop	eShop	—	A16Q SDUCR/L11; A20R SDUCR/L11; A25R SDUCR/L11	—	DC.. 11T3..	22; 27; 32	13.6; 16; 18.5	15; 18; 23	—	—	180; 200; 200	269028 8

DC.T indexable inserts

DCGT fine finishing



Grade	HB7025-1	HB7125-1	HU7315-1	
2IG 26 0350	eShop	eShop	eShop	—
●	P	M	N	
⊗	⊗	⊗	⊗	
Chip breaker	SF	VF	AF	
a _p mm	0.05 – 0.2	0.05 – 0.2	0.05 – 0.6	
f mm/rev.	0.03 – 0.1	0.03 – 0.1		
v _c main application m/min	120 – 300	120 – 300	120 – 600	

DC.. Finishing

Note:

26 0391–0395 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade	CU7010	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HU7315-1	HB7315-1	HB7415-1	
2IG 26 0351	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—
2IG 26 0353	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—
2IG 26 0356	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—
2IG 26 0359	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—
2IG 26 0361	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●	P	P	P	P	M	M	M	N	N	S	
○	M	—	—	—	—	—	—	—	—	M	
⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	
Chip breaker	SS	SS	SS	SS	VS	VS	VS	AF	AF	TIS	
Tolerance	M	M	M	M	M	M	M	G	G	M	
a _p mm	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.05 – 0.6	0.05 – 0.6	0.2 – 1.5	
f mm/rev.	0.05 – 0.2	0.07 – 0.25	0.07 – 0.25	0.07 – 0.25	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.03 – 0.1	0.03 – 0.1	0.05 – 0.3	
v _c main application m/min	90 – 210	150 – 500	140 – 400	120 – 350	90 – 290	80 – 270	70 – 230	120 – 600	120 – 600	50 – 110	
v _c secondary application m/min	80 – 140	—	—	—	—	—	—	—	—	70 – 250	



Grade			IC807	
26B	26 0391	DCMT 11T302	—	10
26B	26 0393	DCMT 11T304	—	10
26B	26 0395	DCMT 11T308	—	10
●			P	
⊗			●	
Chip breaker			F3P	
a_p		mm	0.15 – 2	
f		mm/rev.	0.08 – 0.3	
v_c main application		m/min	50 – 245	



Grade			SP4019	
28D	26 0366	DCGX 0702005	eShop	10
28D	26 0367	DCGT 070201	eShop	10
28D	26 0368	DCGT 070202	eShop	10
28D	26 0369	DCGT 070204	eShop	10
28D	26 0372	DCGT 11T301	eShop	10
28D	26 0373	DCGT 11T302	eShop	10
28D	26 0374	DCGT 11T304	eShop	10
28D	26 0375	DCGT 11T308	eShop	10
●			UNI	
⊗			●	
Chip breaker			62	
a_p		mm	0.15 – 3	
f		mm/rev.	0.05 – 0.3	
v_c main application		m/min	30 – 440	



Grade			CCX	PV720	CA510	CA115P	CA125P	PR1725	CA6525	PDL010	SW05	
25E	26 0380	DCGT 070201	—	—	—	—	—	eShop	—	—	—	1
25E	26 0381	DC.T 070202	eShop	eShop	—	eShop	eShop	eShop	eShop	eShop	eShop	1
25E	26 0382	DC.T 070204	eShop	eShop	eShop	eShop	eShop	—	eShop	eShop	eShop	1
25E	26 0384	DCGT 11T301	—	—	—	—	—	eShop	—	—	—	1
25E	26 0385	DC.T 11T302	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	1
25E	26 0386	DC.T 11T304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	1
25E	26 0387	DCMT 11T308	eShop	eShop	eShop	eShop	eShop	—	—	—	eShop	1
●			P	P	P	P	P	M	M	N	Ti	
○			—	—	—	—	—	P	—	—	—	
⊗			●	●	●	●	⊗	⊗	⊗	⊗	●	
Chip breaker			PP	HQ	HQ	HQ	HQ	MFP-SKS	MQ	AP	MQ	
Tolerance			M	M	M	M	M	G	M	G	M	
a_p		mm	0.1 – 1	0.5 – 1.5	0.5 – 1.5	0.5 – 1.5	0.5 – 1.5	0.2 – 1.5	0.5 – 1.5	0.1 – 1	0.1 – 1	
f		mm/rev.	0.05 – 0.3	0.05 – 0.25	0.05 – 0.25	0.05 – 0.25	0.05 – 0.25	0.03 – 0.2	0.05 – 0.25	0.05 – 0.25	0.05 – 0.2	
v_c main application		m/min	150 – 370	60 – 270	140 – 450	120 – 340	90 – 260	60 – 200	50 – 140	100 – 400	40 – 100	
v_c secondary application		m/min	—	—	—	—	—	50 – 150	—	—	—	





Grade			PV720	CA510	CA115P	CA125P	PR1725	
25E 26 0383	KYOCERA	DCMX 070204 Wiper	eShop	eShop	eShop	eShop	eShop	1
25E 26 0388		DCMX 11T304 Wiper	eShop	eShop	eShop	eShop	eShop	1
●			P	P	P	P	M	
○			—	—	—	—	P	
⚙			●	●	●	●	●	
Chip breaker			WP					
a_p	mm		0.5 – 1.5	0.5 – 1.5	0.15 – 1	0.15 – 1	0.2 – 1.5	
f	mm/rev.		0.05 – 0.25	0.05 – 0.25	0.1 – 0.45	0.1 – 0.45	0.03 – 0.2	
v_c main application	m/min		60 – 270	140 – 450	120 – 340	90 – 260	60 – 200	
v_c secondary application	m/min		—	—	—	—	50 – 150	



Grade			HBT020	HBT130	
22D 26 0363		DCMT 070202	eShop	eShop	—
22D 26 0376	HOLEX	DCMT 070204	eShop	eShop	—
22D 26 0377		DCMT 11T302	eShop	eShop	—
22D 26 0378		DCMT 11T304	eShop	eShop	—
●			P	M	
⚙			●	●	
Chip breaker			PF	M	
a_p	mm		0.4 – 1.5	0.1 – 1	
f	mm/rev.		0.1 – 0.3	0.05 – 0.2	
v_c main application	m/min		120 – 330	60 – 220	

DC.T Medium machining

Note:

26 0510–0513 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade			CB7010	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	HU7310	HB7310	HB725-1	
21G 26 0449		DC.T 070202	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	10
21G 26 0452		DC.T 070204	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
21G 26 0458	Garant	DC.T 11T302	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	eShop	eShop	—	—
21G 26 0462		DC.T 11T304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—
21G 26 0464		DC.T 11T308	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—
●			P	P	P	P	M	M	M	K	N	N	UNI	
○			M	—	—	—	—	—	—	—	—	—	—	
⚙			●	●	●	●	●	●	●	●	●	●	●	
Chip breaker			SM	SM	SM	SM	VM	VM	VM	GM	AM	AM	UM1	
Tolerance			M	M	M	M	M	M	M	M	G	G	M	
a_p	mm		0.2 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.5 – 2.5	0.5 – 2.5	0.5 – 2.5	0.2 – 2.5	0.1 – 4	0.1 – 4	0.2 – 4	
f	mm/rev.		0.1 – 0.3	0.08 – 0.3	0.08 – 0.3	0.08 – 0.3	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.25	0.05 – 0.5	0.05 – 0.5	0.05 – 0.5	
v_c main application	m/min		90 – 240	120 – 440	110 – 350	80 – 290	80 – 260	70 – 240	60 – 200	100 – 450	350 – 600	350 – 600	50 – 250	
v_c secondary application	m/min		70 – 180	—	—	—	—	—	—	—	—	—	—	



Grade		IC807	
26B	26 0510	DCMT 11T304	10
26B	26 0512	DCMT 11T308	10
●		P	
⚙		M3P	
Chip breaker			
a_p	mm	0.8 – 3	
f	mm/rev.	0.1 – 0.3	
v_c main application	m/min	50 – 245	



Grade		IC807	
26B	26 0511	DCMT 11T304	10
26B	26 0513	DCMT 11T308	10
●		M	
⚙		M3M	
Chip breaker			
a_p	mm	0.8 – 3	
f	mm/rev.	0.1 – 0.3	
v_c main application	m/min	30 – 80	



Grade		SP4019	
28D	26 0470	DCMT 070202	10
28D	26 0471	DCMT 070204	10
28D	26 0474	DCMT 11T304	10
28D	26 0475	DCMT 11T308	10
●		UNI	
⚙		73	
Chip breaker			
a_p	mm	0.2 – 4.5	
f	mm/rev.	0.1 – 0.45	
v_c main application	m/min	30 – 440	



Grade		PV720	CA510	CA115P	CA125P	CA6525	CA315	KW10	
25E	26 0481	DCMT 070202	eShop	–	eShop	eShop	eShop	–	10
25E	26 0483	DCMT 070204	eShop	–	eShop	eShop	eShop	–	10
25E	26 0486	DCMT 070208	eShop	–	eShop	eShop	eShop	–	10
25E	26 0488	DCMT 11T302	eShop	–	eShop	eShop	–	–	10
25E	26 0490	DC.T 11T304	eShop	eShop	eShop	eShop	eShop	eShop	1
25E	26 0492	DC.T 11T308	eShop	eShop	eShop	eShop	eShop	eShop	10
●		P	P	P	P	M	O	N	
⚙		●	●	●	●	●	●	●	
Chip breaker		GK	GK	GK	GK	GK	GK	AH	
Tolerance		M	M	M	M	M	M	G	
a_p	mm	0.5 – 3							
f	mm/rev.	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.05 – 0.25	
v_c main application	m/min	60 – 270	140 – 450	120 – 340	90 – 260	50 – 140	60 – 230	30 – 300	

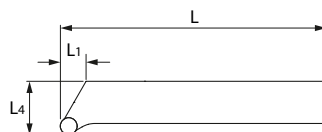
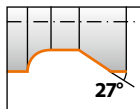


Grade		HBT020	HBT130	
22D	26 0500	DCMT 070204	eShop	10
22D	26 0503	DCMT 11T302	eShop	10
22D	26 0507	DCMT 11T304	eShop	–
22D	26 0508	DCMT 11T308	eShop	10
●		P	M	
⚙		●	●	
Chip breaker		PM	MM	
a_p	mm	0.5 – 2.5	0.3 – 2.5	
f	mm/rev.	0.12 – 0.3	0.05 – 0.35	
v_c main application	m/min	100 – 280	50 – 200	



Garant SRGC screw-on toolholder for indexable inserts RC..**Note:**

Size 16/10–25/10 – When used with indexable insert No. 260640 HU7310-1, use insert screw set No. 269028 2.

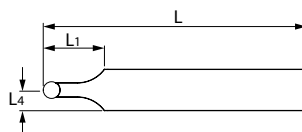
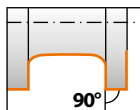


26 0606

Shank / insert size	2IT 26 0606	2IT 26 0607	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder									
mm	right-hand	left-hand			mm	mm	mm			
12/06	eShop	eShop	SRGCR/L 1212F06	RC.T 0602	16	13.6	80	269028 22	—	—
16/06	eShop	eShop	SRGCR/L 1616H06	RC.T 0602	20	13.6	100	269028 22	—	—
20/06	eShop	eShop	SRGCR/L 2020K06	RC.T 0602	25	15.3	125	269028 22	—	—
25/06	eShop	eShop	SRGCR/L 2525M06	RC.T 0602	32	15.3	150	269028 22	—	—
16/08	eShop	eShop	SRGCR/L 1616H08	RC.T 0803	20	18.8	100	269028 29	—	—
20/08	eShop	eShop	SRGCR/L 2020K08	RC.T 0803	25	14.7	125	269028 29	—	—
25/08	eShop	eShop	SRGCR/L 2525M08	RC.T 0803	32	19.8	150	269028 29	—	—
16/10	eShop	eShop	SRGCR/L 1616H10	RC.T 1003	20	15.5	100	269028 1	269005 11	269013 2
20/10	eShop	eShop	SRGCR/L 2020K10	RC.T 1003	25	17	125	269028 1	269005 11	269013 2
25/10	eShop	eShop	SRGCR/L 2525M10	RC.T 1003	32	21	150	269028 1	269005 11	269013 2

Garant SRDC screw-on toolholder for indexable inserts RC..**Note:**

Size 16/10–25/10 – When used with indexable insert No. 260640 HU7310-1, use insert screw set No. 269028 2.

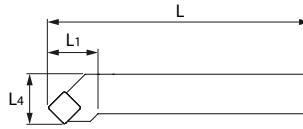
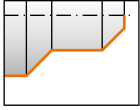


26 0611

Shank / insert size	2IT 26 0611	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder								
mm	neutral			mm	mm	mm			
12/06	eShop	SRDCN 1212F06	RC.T 0602	9	12.4	80	269028 15	—	—
16/06	eShop	SRDCN 1616H06	RC.T 0602	11	12.4	100	269028 15	—	—
20/06	eShop	SRDCN 2020K06	RC.T 0602	13	12.4	125	269028 15	—	—
25/06	eShop	SRDCN 2525M06	RC.T 0602	15.5	12.4	150	269028 15	—	—
16/08	eShop	SRDCN 1616H08	RC.T 0803	12	16.4	100	269028 29	—	—
20/08	eShop	SRDCN 2020K08	RC.T 0803	14	16.4	125	269028 29	—	—
25/08	eShop	SRDCN 2525M08	RC.T 0803	16.5	16.4	150	269028 29	—	—
16/10	eShop	SRDCN 1616H10	RC.T 1003	13	20.3	100	269028 1	269005 11	269013 2
20/10	eShop	SRDCN 2020K10	RC.T 1003	15	20.3	125	269028 1	269005 11	269013 2
25/10	eShop	SRDCN 2525M10	RC.T 1003	17.5	20.3	150	269028 1	269005 11	269013 2
20/12	eShop	SRDCN 2020K12	RC.T 1204	16	20.3	125	269028 2	269005 10	269013 2
25/12	eShop	SRDCN 2525M12	RC.T 1204	18.5	20.3	150	269028 2	269005 10	269013 2

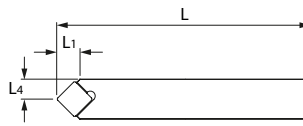
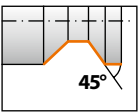
Garant Indexable inserts RC..**RC.. Medium machining**

Grade		HB7020-2	HB7130-2	HU7310-1	HB725-1	
2IG 26 0620	RC.T 0602	—	—	eShop	eShop	10
2IG 26 0630	RC.T 0803	—	—	eShop	eShop	—
2IG 26 0640	RC.X 1003	eShop	eShop	eShop	eShop	10
2IG 26 0650	RC.X 1204	eShop	eShop	eShop	eShop	10
●		P	M	N	UNI	
⚙		SM	VM	AM	UM1	
Chip breaker		M	M	G	M	
Tolerance						
a _p	mm	0.3 – 2	0.5 – 2	0.5 – 2	0.5 – 2	
f	mm/rev.	0.08 – 0.3	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	
v _c main application	m/min	110 – 350	70 – 240	350 – 600	60 – 230	

Garant SSSC 45° screw-on toolholders for indexable inserts SC..


26 0706

Shank / insert size	2T	26 0706	2T	26 0707	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder						mm	mm	mm			
mm	right-hand		left-hand									
8/09	eShop		eShop		SSSCR/L 0808D09	SC.. 09T3..	13.25	21	60	269028 23	—	—
10/09	eShop		eShop		SSSCR/L 1010E09	SC.. 09T3..	14.25	21	70	269028 23	—	—
12/09	eShop		eShop		SSSCR/L 1212F09	SC.. 09T3..	16	18	80	269028 2	—	—
16/09	eShop		eShop		SSSCR/L 1616H09	SC.. 09T3..	20	20	100	269028 2	269005 12	269013 2
20/09	eShop		eShop		SSSCR/L 2020K09	SC.. 09T3..	25	20	125	269028 2	269005 12	269013 2
16/12	eShop		eShop		SSSCR/L 1616H12	SC.. 1204..	20	18	100	269028 20	269005 9	269013 5
20/12	eShop		eShop		SSSCR/L 2020K12	SC.. 1204..	25	27	125	269028 20	269005 9	269013 5
25/12	eShop		eShop		SSSCR/L 2525M12	SC.. 1204..	32	25	150	269028 20	269005 9	269013 5

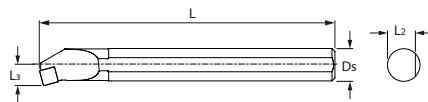
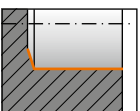
Garant SSDC 45° screw-on toolholders for indexable inserts SC..


26 0711

Shank / insert size	2T	26 0711	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder				mm	mm	mm			
mm	neutral									
12/09	eShop		SSDCN 1212F09	SC.. 09T3..	6	6	80	269028 2	269005 12	269013 2
16/09	eShop		SSDCN 1616H09	SC.. 09T3..	8	9	100	269028 2	269005 12	269013 2
20/09	eShop		SSDCN 2020K09	SC.. 09T3..	10	11	125	269028 2	269005 12	269013 2
16/12	eShop		SSDCN 1616H12	SC.. 1204..	8	8.7	100	269028 20	269005 9	269013 5
20/12	eShop		SSDCN 2020K12	SC.. 1204..	10	11.2	125	269028 20	269005 9	269013 5
25/12	eShop		SSDCN 2525M12	SC.. 1204..	12.5	13.7	150	269028 20	269005 9	269013 5


Garant A... SSSC 45° boring bars for indexable inserts SC..


26



26 0722

Shank Ø / insert size	2T	26 0722	2T	26 0723	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
	Boring bar, steel										
mm	right-hand		left-hand				mm	mm	mm	mm	
16/09	eShop		eShop		A16Q SSSCR/L09	SC.. 09T3..	20	11.5	14	180	269028 8
20/09	eShop		eShop		A20R SSSCR/L09	SC.. 09T3..	26	13.5	18	200	269028 8
25/09	eShop		eShop		A25R SSSCR/L09	SC.. 09T3..	32	17	24	200	269028 8

Indexable inserts SC.T

SCMT Finishing



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7415-1	
2IG 26 0742	SCMT 09T304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 0744	Garant SCMT 09T308	eShop	eShop	eShop	eShop	eShop	eShop	—	10
2IG 26 0748	SCMT 120404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 0750	SCMT 120408	eShop	eShop	eShop	eShop	eShop	eShop	—	10
●		P	P	P	M	M	M	S	
○		—	—	—	—	—	—	M	
⊗		⊗	⊗	⊗	⊗	⊗	⊗	⊗	
Chip breaker		SS	SS	SS	VS	VS	VS	TIS	
a_p	mm	0.2 – 1.5							
f	mm/rev.	0.07 – 0.25	0.07 – 0.25	0.07 – 0.25	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.05 – 0.3	
v_c main application	m/min	150 – 500	140 – 400	120 – 350	90 – 290	80 – 270	70 – 230	50 – 110	
v_c secondary application	m/min	—	—	—	—	—	—	70 – 250	



Grade		HBT020	HBT130	
22D 26 0758	HOLEX SCMT 09T304	eShop	eShop	—
●		P	M	
⊗		⊗	⊗	
Chip breaker		PF	M	
a_p	mm	0.4 – 1.5	0.1 – 1	
f	mm/rev.	0.1 – 0.3	0.05 – 0.2	
v_c main application	m/min	120 – 330	60 – 220	

SC.T Medium machining



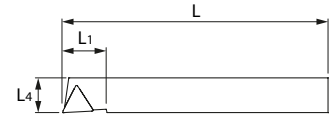
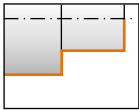
Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7210-1	HU7310	HB7310	HB725-1	
2IG 26 0761	SCGT 09T302	—	—	—	—	—	—	—	eShop	eShop	—	—
2IG 26 0762	SC.T 09T304	eShop	eShop	eShop	eShop	eShop	eShop	—	eShop	eShop	eShop	10
2IG 26 0763	Garant SCMT 09T308	eShop	eShop	eShop	eShop	eShop	eShop	—	—	—	eShop	10
2IG 26 0765	SC.T 120404	eShop	eShop	eShop	eShop	eShop	eShop	—	eShop	eShop	eShop	10
2IG 26 0766	SC.T 120408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●		P	P	P	M	M	M	K	N	N	UNI	
⊗		⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	
Chip breaker		SM	SM	SM	VM	VM	VM	GM	AM	AM	UM1	
Tolerance		M	M	M	M	M	M	M	G	G	M	
a_p	mm	0.3 – 2	0.3 – 2	0.3 – 2	0.5 – 2.5	0.5 – 2.5	0.5 – 2.5	0.2 – 2.5	0.1 – 4	0.1 – 4	0.2 – 4	
f	mm/rev.	0.08 – 0.3	0.08 – 0.3	0.08 – 0.3	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.1 – 0.25	0.05 – 0.5	0.05 – 0.5	0.05 – 0.5	
v_c main application	m/min	120 – 440	110 – 350	80 – 290	80 – 260	70 – 240	60 – 200	100 – 450	350 – 600	350 – 600	50 – 250	



Grade		HBT020	HBT130	
22D 26 0791	SCMT 09T304	eShop	eShop	—
22D 26 0793	HOLEX SCMT 120404	eShop	eShop	—
22D 26 0795	SCMT 120408	eShop	eShop	—
●		P	M	
⊗		⊗	⊗	
Chip breaker		PM	MM	
a_p	mm	0.5 – 2.5	0.3 – 2.5	
f	mm/rev.	0.12 – 0.3	0.05 – 0.35	
v_c main application	m/min	100 – 280	50 – 200	


Garant STJC 93° screw-on toolholder for indexable inserts TC.

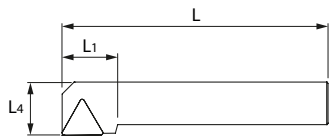

26 0904



Shank / insert size	2TT 26 0904	2TT 26 0905	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws
	Screw-on toolholder							
mm	right-hand	left-hand			mm	mm	mm	
10/11	eShop	eShop	STJCR/L 1010M11	TC.. 1102..	10	16	150	269021 1
12/11	eShop	eShop	STJCR/L 1212M11	TC.. 1102..	12	16	150	269021 1
16/11	eShop	eShop	STJCR/L 1616M11	TC.. 1102..	16	16	150	269021 1

DIN
ISO 5610
Garant STGC 90° screw-on toolholder for indexable inserts TC.

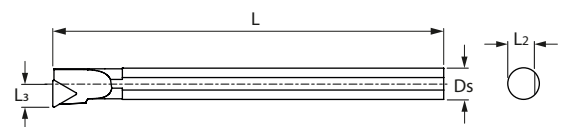
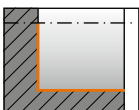

26 0906



Shank / insert size	2TT 26 0906	2TT 26 0907	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder									
mm	right-hand	left-hand			mm	mm	mm			
12/11	eShop	eShop	STGCR/L 1212F11	TC.. 1102..	16	19	80	269028 18	—	—
16/11	eShop	eShop	STGCR/L 1616H11	TC.. 1102..	20	19	100	269028 18	—	—
16/16	eShop	eShop	STGCR/L 1616H16	TC.. 16T3..	20	22	100	269028 2	269005 7	269013 2
20/16	eShop	eShop	STGCR/L 2020K16	TC.. 16T3..	25	22	125	269028 2	269005 7	269013 2
25/16	eShop	eShop	STGCR/L 2525M16	TC.. 16T3..	32	23	150	269028 2	269005 7	269013 2


Garant E... STFC 90° boring bars for indexable inserts TC..

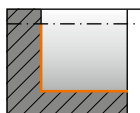

26 0918



Shank Ø / insert size	2TT 26 0918	2TT 26 0919	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	Boring bar carbide									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
10/11	eShop	eShop	E10K STFCR/L11	TC.. 1102..	12	6	9.6	16	125	269028 7
12/11	eShop	eShop	E12M STFCR/L11	TC.. 1102..	15	8	11.5	20	150	269028 7
16/11	eShop	eShop	E16R STFCR/L11	TC.. 1102..	19	10	15.4	25	200	269028 7



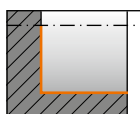
26


Garant AH... STFC 90° boring bars for indexable inserts TC..


26 0922



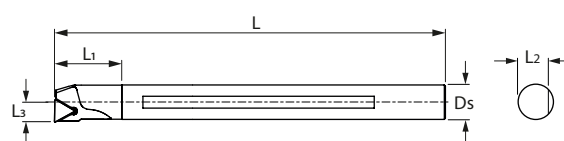
Shank Ø / insert size	2T 26 0922	2T 26 0923	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	Boring bar HSS									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
10/11	eShop	eShop	AH10K STFCR/L11	TC.. 1102..	12	7	9	16	125	269028 7
12/11	eShop	eShop	AH12M STFCR/L11	TC.. 1102..	14	9	11	20	150	269028 7
16/11	eShop	eShop	AH16Q STFCR/L11	TC.. 1102..	18	11	15	25	180	269028 7
20/11	eShop	eShop	AH20R STFCR/L11	TC.. 1102..	23	13	18	32	200	269028 7
25/16	eShop	eShop	AH25R STFCR/L16	TC.. 16T3..	28	17	23	40	200	269028 8


Garant GARANT Master Turn A... STFC 90° boring bars for indexable inserts TC..


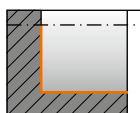
Optimised
chip evacuation



26 0932



Shank Ø / insert size	2T 26 0932	2T 26 0933	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	GARANT Master Turn boring bar, steel spiral flutes									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
10/11	eShop	eShop	A10K STFCR/L11	TC.. 1102..	12	6.2	9	22	125	269028 7
12/11	eShop	eShop	A12L STFCR/L11	TC.. 1102..	14	7.2	11	24.3	140	269028 7
16/11	eShop	eShop	A16Q STFCR/L11	TC.. 1102..	18	9.2	15	31	180	269028 7
20/11	eShop	eShop	A20R STFCR/L11	TC.. 1102..	22	11.1	18	36	200	269028 7


Garant A... STFC 90° boring bars for indexable inserts TC..


26 0934



Shank Ø / insert size	2T 26 0934	2T 26 0935	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws	Shim	Shim screw
	Boring bar steel											
mm	right-hand	left-hand			mm	mm	mm	mm	mm			
10/11	eShop	eShop	A10K STFCR/L11	TC.. 1102..	13	7	9	22.8	125	269028 7	—	—
12/11	eShop	eShop	A12L STFCR/L11	TC.. 1102..	16	9	11	26.5	140	269028 7	—	—
16/11	eShop	eShop	A16Q STFCR/L11	TC.. 1102..	20	11	15	26.7	180	269028 7	—	—
20/16	eShop	eShop	A20R STFCR/L16	TC.. 16T3..	25	13	18	36.6	200	269028 8	—	—
25/16	eShop	eShop	A25R STFCR/L16	TC.. 16T3..	32	17	23	41	200	269028 8	—	—
32/16	eShop	eShop	A32S STFCR/L16	TC.. 16T3..	40	22	30	34.6	250	269028 2	269005 7	269013 2
40/16	eShop	eShop	A40T STFCR/L16	TC.. 16T3..	49	27	39	37.5	300	269028 2	269005 7	269013 2

Indexable inserts TC.T

TCMT Finishing



Grade		CU7010	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7415-1	
2IG 26 0950	TCMT 110202	–	eShop	eShop	eShop	eShop	eShop	eShop	–	10
2IG 26 0952	TCMT 110204	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–
2IG 26 0954	Garant TCMT 110208	–	eShop	eShop	eShop	eShop	eShop	eShop	–	10
2IG 26 0956	TCMT 16T304	–	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 0958	TCMT 16T308	–	eShop	eShop	eShop	eShop	eShop	eShop	–	10
●		P	P	P	P	M	M	M	S	
○		M	–	–	–	–	–	–	M	
⚙		●	●	●	●	●	●	●	●	
Chip breaker		SS	SS	SS	SS	VS	VS	VS	TIS	
a_p	mm	0.2 – 1.5								
f	mm/rev.	0.05 – 0.2	0.07 – 0.25	0.07 – 0.25	0.07 – 0.25	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.05 – 0.3	
v_c main application	m/min	90 – 210	150 – 500	140 – 400	120 – 350	90 – 290	80 – 270	70 – 230	50 – 110	
v_c secondary application	m/min	80 – 140	–	–	–	–	–	–	70 – 250	



Grade		HB7020	HB7130	
22D 26 0966	HOLEX TCMT 110204	eShop	eShop	–
22D 26 0968	TCMT 16T304	eShop	eShop	–
●		P	M	
⚙		●	●	
Chip breaker		PF	M	
a_p	mm	0.4 – 1.5	0.1 – 1	
f	mm/rev.	0.1 – 0.3	0.05 – 0.2	
v_c main application	m/min	120 – 330	60 – 220	

TC.T Medium machining

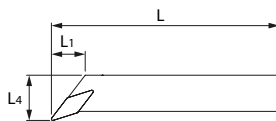
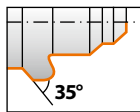


Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HU7310	HB725-1	
2IG 26 0980	TC.T 110202	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	10
2IG 26 0982	Garant TC.T 110204	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 0986	TC.T 16T304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 0988	TCMT 16T308	eShop	eShop	eShop	eShop	eShop	eShop	–	eShop	10
●		P	P	P	M	M	M	N	UNI	
⚙		●	●	●	●	●	●	●	●	
Chip breaker		SM	SM	SM	VM	VM	VM	AM	UM1	
Tolerance		M	M	M	M	M	M	G	M	
a_p	mm	0.3 – 2	0.3 – 2	0.3 – 2	0.5 – 2.5	0.5 – 2.5	0.5 – 2.5	0.1 – 4	0.2 – 4	
f	mm/rev.	0.08 – 0.3	0.08 – 0.3	0.08 – 0.3	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.05 – 0.5	0.05 – 0.5	
v_c main application	m/min	120 – 440	110 – 350	80 – 290	80 – 260	70 – 240	60 – 200	350 – 600	50 – 250	



Grade		HB7020	HB7130	
22D 26 1012	TCMT 110204	eShop	eShop	–
22D 26 1018	HOLEX TCMT 16T304	eShop	eShop	–
22D 26 1019	TCMT 16T308	eShop	eShop	–
●		P	M	
⚙		●	●	
Chip breaker		PM	MM	
a_p	mm	0.5 – 2.5	0.3 – 2.5	
f	mm/rev.	0.12 – 0.3	0.05 – 0.35	
v_c main application	m/min	100 – 280	50 – 200	

Garant SVHB 107.5° screw-on toolholder for indexable inserts VB..

 DIN
ISO 5610


26 1106

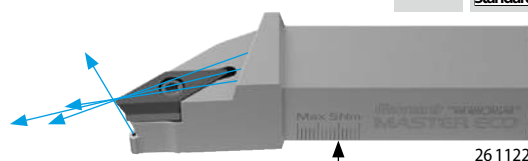
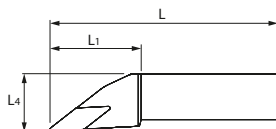
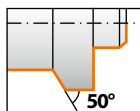
Shank / insert size	21T 26 1106	21T 26 1107	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder									
mm	right-hand	left-hand			mm	mm	mm			
12/11	eShop	eShop	SVHBR/L 1212F11	VB.. 1103..	16	13	80	269028 22	—	—
16/11	eShop	eShop	SVHBR/L 1616H11	VB.. 1103..	20	13	100	269028 22	—	—
20/11	eShop	eShop	SVHBR/L 2020K11	VB.. 1103..	25	17	125	269028 22	—	—
20/16	eShop	eShop	SVHBR/L 2020K16	VB.. 1604..	25	16	125	269028 2	269005 8	269013 2
25/16	eShop	eShop	SVHBR/L 2525M16	VB.. 1604..	32	21	150	269028 2	269005 8	269013 2


Garant GARANT Master Eco SVJB 93° screw-on toolholder for indexable inserts VB..

Highly efficient cooling directly on the cutting edge and additional flank face cooling.

Note:

Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holders No. 319006 — 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.

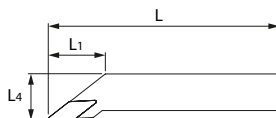
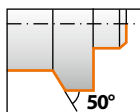
 DIN
ISO 5610


Positioning within the scale ensures precise coolant transfer.

26 1122

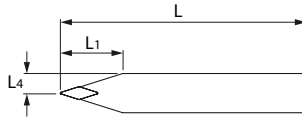
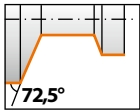
Shank / insert size	21U 26 1122	21U 26 1123	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	GARANT Master Eco screw-on toolholder short									
mm	right-hand	left-hand			mm	mm	mm			
20/11	eShop	eShop	SVJBR/L 2020X11	VB.. 1103..	25	35	95	269023 1	—	—
20/16	eShop	eShop	SVJBR/L 2020H16	VB.. 1604..	25	40	100	269023 3	259033 5	269013 7
25/16	eShop	eShop	SVJBR/L 2525X16	VB.. 1604..	32	40	110	269023 3	259033 5	269013 7

Garant SVJB 93° screw-on toolholder for indexable inserts VB..

 DIN
ISO 5610


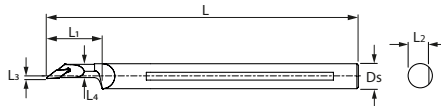
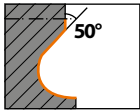
26 1108

Shank / insert size	21T 26 1108	21T 26 1109	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
	Screw-on toolholder									
mm	right-hand	left-hand			mm	mm	mm			
12/11	eShop	eShop	SVJBR/L 1212F11	VB.. 1103..	16	21.5	80	269028 22	—	—
16/11	eShop	eShop	SVJBR/L 1616H11	VB.. 1103..	20	21.5	100	269028 22	—	—
20/11	eShop	eShop	SVJBR/L 2020K11	VB.. 1103..	25	23	125	269028 22	—	—
20/16	eShop	eShop	SVJBR/L 2020K16	VB.. 1604..	25	30	125	269028 2	269005 8	269013 2
25/16	eShop	eShop	SVJBR/L 2525M16	VB.. 1604..	32	33	150	269028 2	269005 8	269013 2

Garant SVVB 72.5° screw-on toolholders for indexable inserts VB..


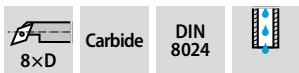
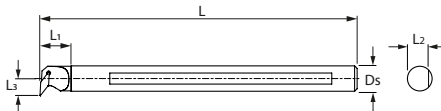
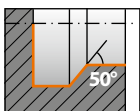
26 1111

Shank / insert size	21T	26 1111	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
		Screw-on toolholder								
mm		neutral			mm	mm	mm			
12/11		eShop	SVVBN 1212F11	VB.. 1103..	6	18.5	80	269028 22	—	—
16/11		eShop	SVVBN 1616H11	VB.. 1103..	8	25	100	269028 22	—	—
20/11		eShop	SVVBN 2020K11	VB.. 1103..	10	32	125	269028 22	—	—
25/11		eShop	SVVBN 2525M11	VB.. 1103..	12.5	39	150	269028 22	—	—
20/16		eShop	SVVBN 2020K16	VB.. 1604..	10	31	125	269028 2	269005 8	269013 2
25/16		eShop	SVVBN 2525M16	VB.. 1604..	12.5	39	150	269028 2	269005 8	269013 2


Garant E... SVJB 142° boring bars for indexable inserts VB..


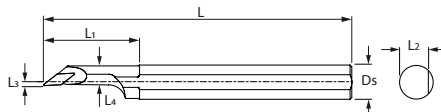
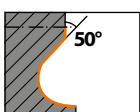
26 1112

Shank Ø / insert size	21T	26 1112	21T	26 1113	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
		Boring bar carbide											
mm		right-hand		left-hand			mm	mm	mm	mm	mm	mm	
16/11		eShop		eShop	E16R SVJBR/L11	VB.. 1103..	22	2	15	9.5	31.4	200	269028 7
20/11		eShop		eShop	E20S SVJBR/L11	VB.. 1103..	24	2	19	11	38	250	269028 7
25/16		eShop		eShop	E25S SVJBR/L16	VB.. 1604..	28	4.6	24	16.5	44	250	269028 8


Garant E... SVUB 93° boring bars for indexable inserts VB..


26 1118

Shank Ø / insert size	21T	26 1118	21T	26 1119	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
		Boring bar carbide										
mm		right-hand		left-hand			mm	mm	mm	mm	mm	
16/11		eShop		eShop	E16R SVUBR/L11	VB.. 1103..	21	11	15	16.5	200	269028 7
20/11		eShop		eShop	E20S SVUBR/L11	VB.. 1103..	25	13	18	20.5	250	269028 7
25/11		eShop		eShop	E25S SVUBR/L11	VB.. 1103..	31.5	17	23	23	250	269028 7


Garant A... SVJB 142° boring bars for indexable inserts VB..


26 1124

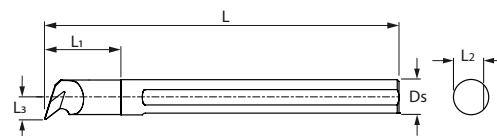
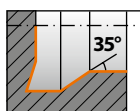
Shank Ø / insert size	21T	26 1124	21T	26 1125	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
		Boring bar steel											
mm		right-hand		left-hand			mm	mm	mm	mm	mm	mm	
16/11		eShop		eShop	A16M SVJBR/L11	VB.. 1103..	22	2	15	9.5	31.4	150	269028 7
20/11		eShop		eShop	A20Q SVJBR/L11	VB.. 1103..	25	2	19	11	38	180	269028 7
25/16		eShop		eShop	A25R SVJBR/L16	VB.. 1604..	28	4.6	24	16.5	44	200	269028 8



26

DIN
8024
Garant A... SVQB 107.5° boring bars for indexable inserts VB..


26 1130



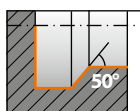
Shank Ø / insert size	2IT 26 1130	2IT 26 1131	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	Boring bar steel									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
16/11	eShop	eShop	A16Q SVQBR/L11	VB.. 1103..	21	11	15.5	16.5	180	269028 22
20/11	eShop	eShop	A20R SVQBR/L11	VB.. 1103..	25	13	19	20.5	200	269028 22
25/16	eShop	eShop	A25R SVQBR/L16	VB.. 1604..	32	17	23	40	200	269028 8

DIN
8024
Garant GARANT Master Turn A... SVUB 93° boring bars for indexable inserts VB..

Optimised
chip evacuation



26 1128



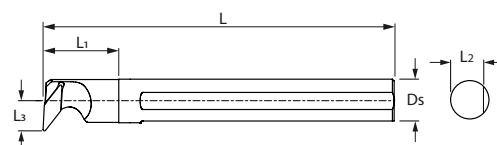
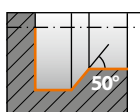
Shank Ø / insert size	2IT 26 1128	2IT 26 1129	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	GARANT Master Turn boring bar, steel spiral flutes									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
16/11	eShop	eShop	A16Q SVUBR/L11	VB.. 1103..	20	11	15	31	180	269028 7
20/11	eShop	eShop	A20R SVUBR/L11	VB.. 1103..	24	13	18	36	200	269028 7
25/16	eShop	eShop	A25R SVUBR/L16	VB.. 1604..	31	17	23	40	200	269028 8

DIN
8024
Garant A... SVUB 93° boring bars for indexable inserts VB..

DIN
8024



26 1132



Shank Ø / insert size	2IT 26 1132	2IT 26 1133	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws	Shim	Shim screw
	Boring bar, steel											
mm	right-hand	left-hand			mm	mm	mm	mm	mm			
16/11	eShop	eShop	A16Q SVUBR/L11	VB.. 1103..	21	11	15.5	16.5	180	269028 7	—	—
20/11	eShop	eShop	A20R SVUBR/L11	VB.. 1103..	25	13	18	20.5	200	269028 7	—	—
25/16	eShop	eShop	A25R SVUBR/L16	VB.. 1604..	32	17	24	25.5	200	269028 8	—	—
32/16	eShop	eShop	A32S SVUBR/L16	VB.. 1604..	40	22	31	33.5	250	269028 2	269005 8	269013 2
40/16	eShop	eShop	A40T SVUBR/L16	VB.. 1604..	49	27	39	40	300	269028 2	269005 8	269013 2

Indexable inserts VB. T

VBMT Finishing



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HB7415-1	
2IG 26 1142	VBMT 110302	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1144	VBMT 110304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1150	Garant VBMT 160402	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1152	VBMT 160404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1154	VBMT 160408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●		P	P	P	M	M	M	S	
○		—	—	—	—	—	—	M	
⚙		●	●	●	●	●	●	●	
Chip breaker		SS	SS	SS	VS	VS	VS	TIS	
a_p	mm	0.2 – 1.5							
f	mm/rev.	0.07 – 0.25	0.07 – 0.25	0.07 – 0.25	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.05 – 0.3	
v_c main application	m/min	150 – 500	140 – 400	120 – 350	90 – 290	80 – 270	70 – 230	50 – 110	
v_c secondary application	m/min	—	—	—	—	—	—	70 – 250	



Grade		CCX	PV720	CA510	CA115P	CA125P	CA6525	
2SE 26 1174	 VBMT 110304	eShop	eShop	eShop	eShop	eShop	eShop	10
2SE 26 1176		VBMT 110308	eShop	eShop	eShop	eShop	eShop	10
2SE 26 1182		VBMT 160404	eShop	eShop	eShop	eShop	eShop	10
2SE 26 1184		VBMT 160408	eShop	eShop	eShop	eShop	eShop	10
		P	P	P	P	P	M	
								
Chip breaker		PP	HQ	HQ	HQ	HQ	HQ	
a_p	mm	0.1 – 1	0.5 – 2	0.5 – 2	0.5 – 2	0.5 – 2	0.5 – 2	
f	mm/rev.	0.05 – 0.25						
v_c main application	m/min	140 – 300	60 – 270	140 – 450	140 – 340	110 – 260	50 – 140	



Grade		HB7020	HB7130	
22D 26 1186	VBMT 110304	eShop	eShop	10
22D 26 1188	HOLEX VBMT 160404	eShop	eShop	10
●		P	M	
○		●	●	
Chip breaker		PF	M	
a_p	mm	0.4 – 1.5	0.1 – 1	
f	mm/rev.	0.1 – 0.3	0.05 – 0.2	
v_c main application	m/min	120 – 330	60 – 220	

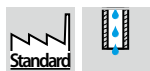
VB.T Medium machining



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HU7310	HB7310	HB725-1	
2IG 26 1220	VBGT 110301	—	—	—	—	—	—	eShop	—	—	10
2IG 26 1222	VBGT 110302	—	—	—	—	—	—	eShop	eShop	—	10
2IG 26 1224	Garant VB.T 110304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1232	VB.T 160404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1234	VB.T 160408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●		P	P	P	M	M	M	N	N	UNI	
○		●	●	●	●	●	●	●	●	●	
Chip breaker		SM	SM	SM	VM	VM	VM	AM	AM	UM1	
Tolerance		M	M	M	M	M	M	G	G	M	
a_p	mm	0.3 – 2	0.3 – 2	0.3 – 2	0.5 – 2.5	0.5 – 2.5	0.5 – 2.5	0.1 – 4	0.1 – 4	0.2 – 4	
f	mm/rev.	0.08 – 0.3	0.08 – 0.3	0.08 – 0.3	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.05 – 0.5	0.05 – 0.5	0.05 – 0.5	
v_c main application	m/min	120 – 440	110 – 350	80 – 290	80 – 260	70 – 240	60 – 200	350 – 600	350 – 600	50 – 250	



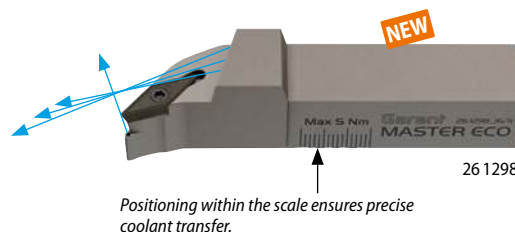
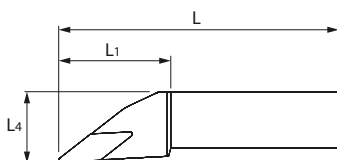
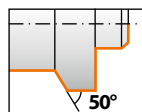
			HBTO20	HBTO130	
Grade					
22D 26 1252	VBMT 110304		eShop	eShop	10
22D 26 1257	HOLEX VBMT 160404		eShop	eShop	10
22D 26 1259	VBMT 160408		eShop	eShop	10
●			P	M	
⚙			PM	MM	
Chip breaker			PM	MM	
a_p	mm		0.5 – 2.5	0.3 – 2.5	
f	mm/rev.		0.12 – 0.3	0.05 – 0.35	
v_c main application	m/min		100 – 280	50 – 200	



Garant GARANT Master Eco SVHC 107.5° screw-on toolholder for indexable inserts VC..

Highly efficient cooling directly on the cutting edge and additional flank face cooling.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holders No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



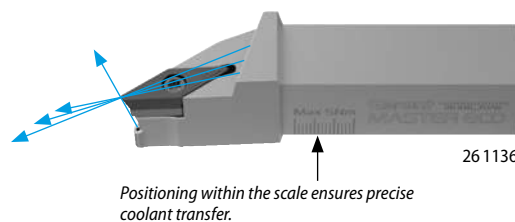
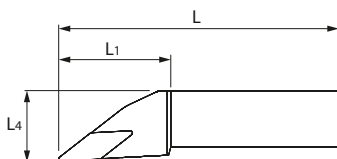
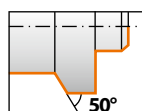
Shank / insert size	2TU 26 1298	2TU 26 1299	ISO code toolholder	suitable indexable insert	L_4	L_1	L	Set of insert screws	Shim	Shim screw
	GARANT Master Eco screw-on toolholder short									
mm	right-hand	left-hand			mm	mm	mm			
16/11	eShop	eShop	SVJCR/L 1616X11	VC.. 1103..	20	35	85	269023 1	—	—
20/11	eShop	eShop	SVJCR/L 2020X11	VC.. 1103..	25	35	95	269023 1	—	—
20/16	eShop	eShop	SVJCR/L 2020H16	VC.. 1604..	25	40	100	269023 3	259033 5	269013 7
25/16	eShop	eShop	SVJCR/L 2525X16	VC.. 1604..	32	40	110	269023 3	259033 5	269013 7



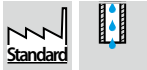
Garant GARANT Master Eco SVJC 93° screw-on toolholder for indexable inserts VC..

Highly efficient cooling directly on the cutting edge and additional flank face cooling.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holders No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



Shank / insert size	2TU 26 1136	2TU 26 1137	ISO code toolholder	suitable indexable insert	L_4	L_1	L	Set of insert screws	Shim	Shim screw
	GARANT Master Eco screw-on toolholder short									
mm	right-hand	left-hand			mm	mm	mm			
16/11	eShop	eShop	SVJCR/L 1616X11	VC.. 1103..	20	35	85	269023 1	—	—
20/11	eShop	eShop	SVJCR/L 2020X11	VC.. 1103..	25	35	95	269023 1	—	—
20/16	eShop	eShop	SVJCR/L 2020H16	VC.. 1604..	25	40	100	269023 3	259033 5	269013 7
25/16	eShop	eShop	SVJCR/L 2525X16	VC.. 1604..	32	40	110	269023 3	259033 5	269013 7



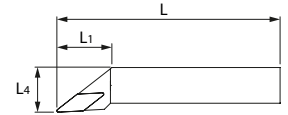
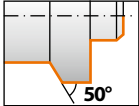
HOLEX Pro Eco SVJC 93° screw-on toolholder for indexable inserts VC..

Targeted cooling on the cutting edge.

Note: Coolant transfer under the head via hose connection (G 1/8 inch – included in delivery).



26 1300

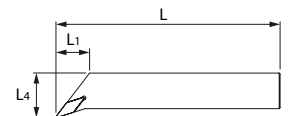
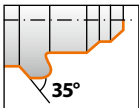


Shank / insert size	22E	26 1300	22E	26 1301	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws
	HOLEX Pro Eco screw-on toolholder									
mm		right-hand		left-hand			mm	mm	mm	
20/11		eShop		eShop	SVJCR/L 2020K11	VC.. 1103..	25	24	125	269028 22
25/11		eShop		eShop	SVJCR/L 2525M11	VC.. 1103..	32	26	150	269028 22

Garant SVHC 107.5° screw-on toolholder for indexable inserts VC..



26 1308



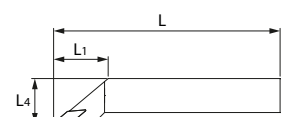
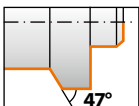
Shank / insert size	21T	26 1308	21T	26 1309	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
		Screw-on toolholder										
mm		right-hand		left-hand			mm	mm	mm			
12/11		eShop		eShop	SVHCR/L 1212F11	VC.. 1103..	16	13	80	269028 22	—	—
16/11		eShop		eShop	SVHCR/L 1616H11	VC.. 1103..	20	13	100	269028 22	—	—
20/11		eShop		eShop	SVHCR/L 2020K11	VC.. 1103..	25	17	125	269028 22	—	—
25/11		eShop		eShop	SVHCR/L 2525M11	VC.. 1103..	32	22.9	150	269028 22	—	—
20/16		eShop		eShop	SVHCR/L 2020K16	VC.. 1604..	25	15	125	269028 2	269005 8	269013 2
25/16		eShop		eShop	SVHCR/L 2525M16	VC.. 1604..	32	23.5	150	269028 2	269005 8	269013 2



Garant SVLC 95° screw-on toolholder for indexable inserts VC..



26 1306



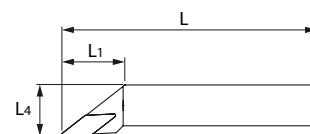
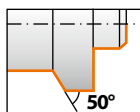
Shank size / insert size	21T	26 1306	21T	26 1307	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws
		Screw-on toolholder								
mm		right-hand		left-hand			mm	mm	mm	
8/07		eShop		eShop	SVLCR/L 0808D07	VC.. 0702..	10	15	60	269028 27
10/07		eShop		eShop	SVLCR/L 1010E07	VC.. 0702..	12	15	70	269028 27
12/07		eShop		eShop	SVLCR/L 1212F07	VC.. 0702..	16	18	80	269028 27



26

Garant SVJC 93° screw-on toolholder for indexable inserts VC..

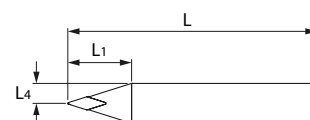
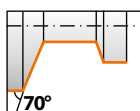

26 1312



Shank / insert size	2T	26 1312	2T	26 1313	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
		Screw-on toolholder										
mm		right-hand		left-hand			mm	mm	mm			
12/11		eShop		eShop	SVJCR/L 1212F11	VC.. 1103..	16	21.5	80	269028 22	—	—
16/11		eShop		eShop	SVJCR/L 1616H11	VC.. 1103..	20	21.5	100	269028 22	—	—
20/11		eShop		eShop	SVJCR/L 2020K11	VC.. 1103..	25	24	125	269028 22	—	—
25/11		eShop		eShop	SVJCR/L 2525M11	VC.. 1103..	32	26	150	269028 22	—	—
20/16		eShop		eShop	SVJCR/L 2020K16	VC.. 1604..	25	29.5	125	269028 2	269005 8	269013 2
25/16		eShop		eShop	SVJCR/L 2525M16	VC.. 1604..	32	32.5	150	269028 2	269005 8	269013 2


Garant SVVC 72.5° screw-on toolholders for indexable inserts VC..

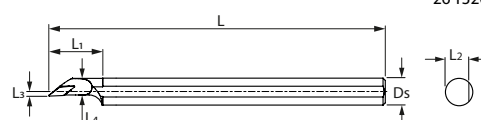
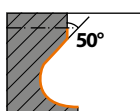

26 1317



Shank / insert size	2T	26 1317	ISO code toolholder	suitable indexable insert	L ₄	L ₁	L	Set of insert screws	Shim	Shim screw
		Screw-on toolholder								
mm		neutral			mm	mm	mm			
8/07		eShop	SVVCN 0808K07	VC.. 0702..	4	15	125	269028 27	—	—
10/07		eShop	SVVCN 1010M07	VC.. 0702..	5	15	150	269028 27	—	—
12/07		eShop	SVVCN 1212M07	VC.. 0702..	6	18	150	269028 27	—	—
12/11		eShop	SVVCN 1212F11	VC.. 1103..	6	18	80	269028 22	—	—
16/11		eShop	SVVCN 1616H11	VC.. 1103..	8	25	100	269028 22	—	—
20/11		eShop	SVVCN 2020K11	VC.. 1103..	10	31	125	269028 22	—	—
25/11		eShop	SVVCN 2525M11	VC.. 1103..	12.5	39	150	269028 22	—	—
20/16		eShop	SVVCN 2020K16	VC.. 1604..	10	31	125	269028 2	269005 8	269013 2
25/16		eShop	SVVCN 2525M16	VC.. 1604..	12.5	38	150	269028 2	269005 8	269013 2


Garant E... SVJC 142° boring bars for indexable inserts VC..

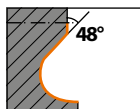

26 1326



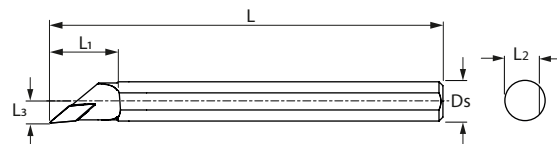
Shank Ø / insert size	2T	26 1326	2T	26 1327	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
		Boring bar carbide											
mm		right-hand		left-hand			mm	mm	mm	mm	mm	mm	
8/05		eShop		eShop	E08F SVJCR/L05	VC.. 0501..	8	3	7.5	6	26	80	269028 26
10/07		eShop		eShop	E10K SVJCR/L07	VC.. 0702..	13	1.5	9	6.3	18	125	269028 27
12/07		eShop		eShop	E12M SVJCR/L07	VC.. 0702..	13	2	11	7.8	18	150	269028 27
16/11		eShop		eShop	E16R SVJCR/L11	VC.. 1103..	22	2	15	9.5	31.4	200	269028 27



Garant E... SVOC 140° boring bars for indexable inserts VC..



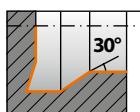
26 1376



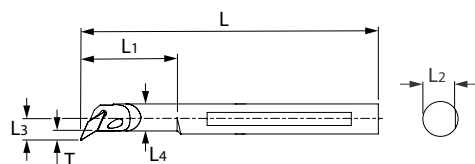
Shank Ø / insert size	2T 26 1376	2T 26 1377	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	Boring bar carbide									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
8/05	eShop	eShop	E08F SVOCR/L05	VC.. 0501..	8	3	7.5	26	80	269028 26
10/07	eShop	eShop	E10H SVOCR/L07	VC.. 0702..	11	5.5	9	—	100	269028 27



Garant E... SVXC 113° boring bars for indexable inserts VC..



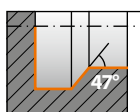
26 1368



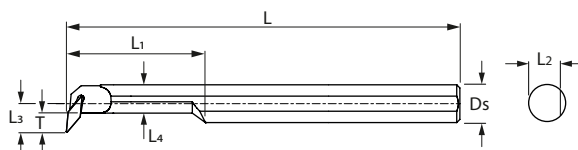
Shank Ø / insert size	2T 26 1368	2T 26 1369	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar carbide											
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	mm	
8/05	eShop	eShop	E08F SVXCR/L05	VC.. 0501..	9.2	5	7.5	3	6	26	80	269028 27
10/07	eShop	eShop	E10H SVXCR/L07	VC.. 0702..	12.5	7	9	3	6.8	32	100	269028 26
12/07	eShop	eShop	E12K SVXCR/L07	VC.. 0702..	15.5	9	11	3	—	40	125	269028 26
16/07	eShop	eShop	E16M SVXCR/L07	VC.. 0702..	19.5	11	15	3	—	55	150	269028 26



Garant E... SVLC 95° boring bars for indexable inserts VC..



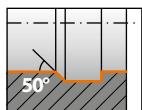
26 1332



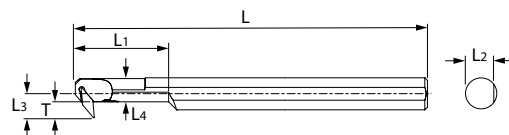
Shank Ø / insert size	2T 26 1332	2T 26 1333	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar carbide											
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	mm	
8/05	eShop	eShop	E08F SVLCR/L05	VC.. 0501..	9.2	5	7.5	3	6	26	80	269028 27
10/07	eShop	eShop	E10H SVLCR/L07	VC.. 0702..	12.5	7	9	5	7.5	32	100	269028 26
12/07	eShop	eShop	E12K SVLCR/L07	VC.. 0702..	15.5	9	11	6	9	40	125	269028 26
16/07	eShop	eShop	E16M SVLCR/L07	VC.. 0702..	19.5	11	15	5	14.5	55	150	269028 26



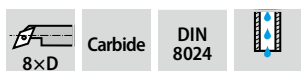
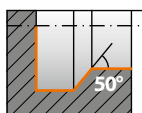
26


Garant E... SV95C 95° boring bars for indexable inserts VC..


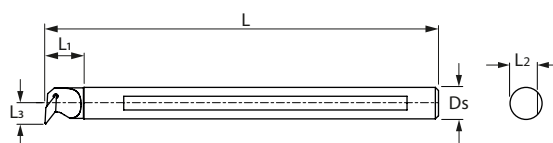
26 1342



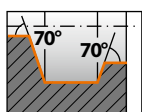
Shank Ø / insert size	21T 26 1342	21T 26 1343	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar carbide											
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	mm	
8/05	eShop	eShop	E08F SV95CR/L05	VC.. 0501..	9.2	5	7.5	3	6	26	80	269028 27
10/07	eShop	eShop	E10H SV95CR/L07	VC.. 0702..	12.5	7	9	5	6.8	32	100	269028 26
12/07	eShop	eShop	E12K SV95CR/L07	VC.. 0702..	15.5	9	11	6	9	40	125	269028 26
16/07	eShop	eShop	E16M SV95CR/L07	VC.. 0702..	19.5	11	15	8	12.9	55	150	269028 26


Garant E... SVUC 93° boring bars for indexable inserts VC..


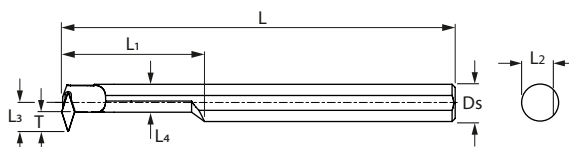
26 1328



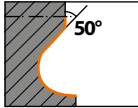
Shank Ø / insert size	21T 26 1328	21T 26 1329	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	Boring bar carbide									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
16/11	eShop	eShop	E16R SVUCR/L11	VC.. 1103..	21	11	15	16.5	200	269028 7
20/11	eShop	eShop	E20S SVUCR/L11	VC.. 1103..	25	13	18	20.5	250	269028 7
25/11	eShop	eShop	E25S SVUCR/L11	VC.. 1103..	31.5	17	23	23	250	269028 7


Garant E... SVVC 72.5° boring bars for indexable inserts VC..


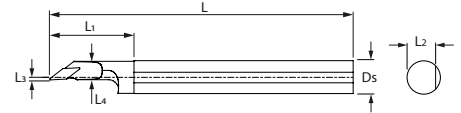
26 1336



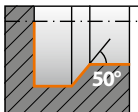
Shank Ø / insert size	21T 26 1336	21T 26 1337	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar carbide											
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	mm	
8/05	eShop	eShop	E08F SVVCR/L05	VC.. 0501..	10.2	5.5	7.5	3.5	6	26	80	269028 27
10/07	eShop	eShop	E10H SVVCR/L07	VC.. 0702..	12.5	8	9	6	6.8	32	100	269028 26
12/07	eShop	eShop	E12K SVVCR/L07	VC.. 0702..	15.5	9	11	6	9	40	125	269028 26
16/07	eShop	eShop	E16M SVVCR/L07	VC.. 0702..	19.5	11	15	6	12.9	55	150	269028 26


Garant AH... SVJC 142° boring bars for indexable inserts VC..


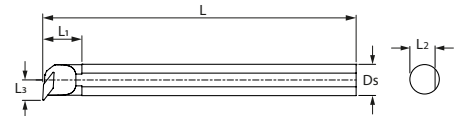
26 1330



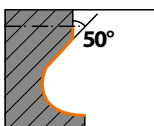
Shank Ø / insert size	21T 26 1330	21T 26 1331	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
	Boring bar HSS										
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	
16/11	eShop	eShop	AH16M SVJCR/L11	VC.. 1103..	22	4.6	15	11.6	30	150	269028 7
20/11	eShop	eShop	AH20Q SVJCR/L11	VC.. 1103..	25	4.6	19	12	38	180	269028 7
25/16	eShop	eShop	AH25R SVJCR/L16	VC.. 1604..	28	3.5	24	14.5	44	200	269028 8


Garant AH... SVUC 93° boring bars for indexable inserts VC..


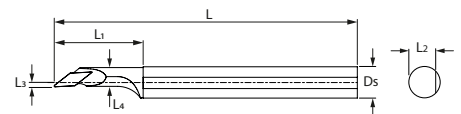
26 1334



Shank Ø / insert size	21T 26 1334	21T 26 1335	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	Boring bar HSS									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
16/11	eShop	eShop	AH16Q SVUCR/L11	VC.. 1103..	21	11	15	20	180	269028 7
20/11	eShop	eShop	AH20R SVUCR/L11	VC.. 1103..	25	13	18	24	200	269028 7
25/16	eShop	eShop	AH25R SVUCR/L16	VC.. 1604..	31.5	17	23	25.5	200	269028 8


Garant A... SVJC 142° boring bars for indexable inserts VC..


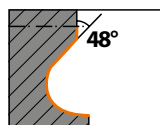
26 1338



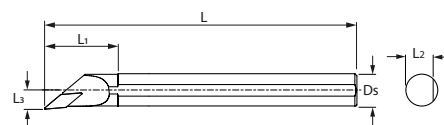
Shank Ø / insert size	21T 26 1338	21T 26 1339	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
	Boring bar steel										
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	
8/05	eShop	eShop	A08F SVJCR/L05	VC.. 0501..	8	3	7.5	6	15	80	269028 26
10/07	eShop	eShop	A10K SVJCR/L07	VC.. 0702..	13	1.5	9	6.3	18	125	269028 27
12/07	eShop	eShop	A12L SVJCR/L07	VC.. 0702..	13	2	11	7.8	18	140	269028 27
16/11	eShop	eShop	A16M SVJCR/L11	VC.. 1103..	22	2	15	9.5	30	150	269028 7
20/11	eShop	eShop	A20Q SVJCR/L11	VC.. 1103..	24	2	19	11	38	180	269028 7
25/16	eShop	eShop	A25R SVJCR/L16	VC.. 1604..	28	4.6	24	16.5	44	200	269028 8



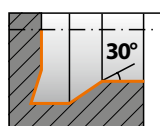
26


Garant A... SVOC 140° boring bars for indexable inserts VC..


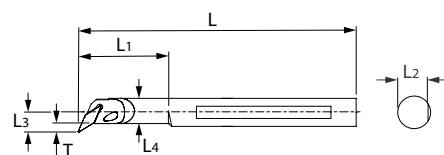
26 1378



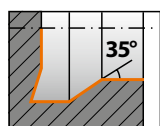
Shank Ø / insert size	21T 26 1378	21T 26 1379	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	Boring bar, steel									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
8/05	eShop	eShop	A08F SVOCR/L05	VC.. 0501..	8	3	7.5	15	80	269028 26
10/07	eShop	eShop	A10H SVOCR/L07	VC.. 0702..	11	5.5	9	22	100	269028 27
12/07	eShop	eShop	A12L SVOCR/L07	VC.. 0702..	13	6.5	11	24	140	269028 27
16/11	eShop	eShop	A16M SVOCR/L11	VC.. 1103..	22	9	15	35	150	269028 7
20/11	eShop	eShop	A20Q SVOCR/L11	VC.. 1103..	24	11	19	40	180	269028 7


Garant A... SVXC 113° boring bars for indexable inserts VC..


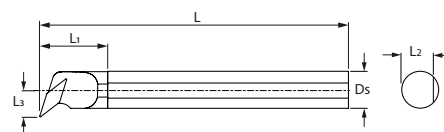
26 1356



Shank Ø / insert size	21T 26 1356	21T 26 1357	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar steel											
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	mm	
8/05	eShop	eShop	A08F SVXCR/L05	VC.. 0501..	9.2	5	7.5	3	6	15	80	269028 27
10/07	eShop	eShop	A10H SVXCR/L07	VC.. 0702..	12.5	7	9	3	6.8	22	100	269028 26
12/07	eShop	eShop	A12K SVXCR/L07	VC.. 0702..	15.5	9	11	3	—	—	125	269028 26
16/07	eShop	eShop	A16M SVXCR/L07	VC.. 0702..	19.5	11	15	3	—	—	150	269028 26


Garant A... SVQC 107.5° boring bars for indexable inserts VC..


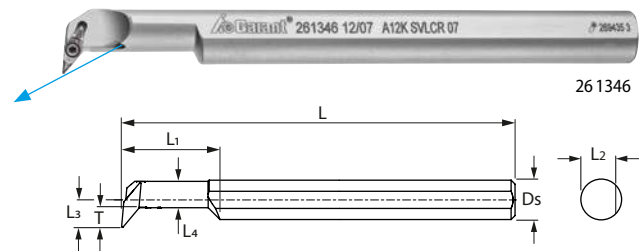
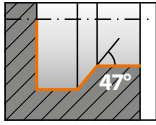
26 1344



Shank Ø / insert size	21T 26 1344	21T 26 1345	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws	Shim	Shim screw
	Boring bar steel											
mm	right-hand	left-hand			mm	mm	mm	mm	mm			
16/11	eShop	eShop	A16Q SVQCR/L11	VC.. 1103..	21	11	15.5	16.5	180	269028 7	—	—
20/11	eShop	eShop	A20R SVQCR/L11	VC.. 1103..	24	13	19	26.1	200	269028 7	—	—
25/16	eShop	eShop	A25R SVQCR/L16	VC.. 1604..	31.5	17	23	43	200	269028 8	—	—
32/16	eShop	eShop	A32S SVQCR/L16	VC.. 1604..	40	22	31	33.5	250	269028 2	269005 8	269013 2
40/16	eShop	eShop	A40T SVQCR/L16	VC.. 1604..	49	27	39	40	300	269028 2	269005 8	269013 2



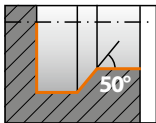
Garant A... SVLC 95° boring bars for indexable inserts VC..



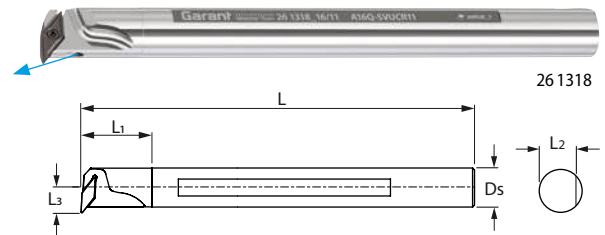
Shank Ø / insert size	21T 26 1346	21T 26 1347	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar, steel											
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	mm	
8/05	eShop	eShop	A08F SVLCR/L05	VC.. 0501..	9.2	5	7.5	3	6	15	80	269028 26
10/07	eShop	eShop	A10H SVLCR/L07	VC.. 0702..	12.5	7	9	5	7.5	22	100	269028 27
12/07	eShop	eShop	A12K SVLCR/L07	VC.. 0702..	15.5	9	11	6	9	28	125	269028 27
16/07	eShop	eShop	A16M SVLCR/L07	VC.. 0702..	19.5	11	15	5	14.5	36	150	269028 27



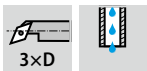
Garant GARANT Master Turn A... SVUC 93° boring bars for indexable inserts VC..



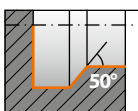
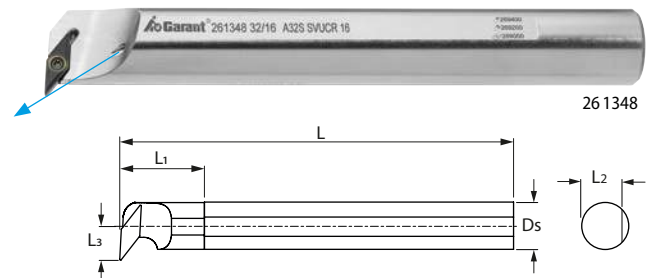
Optimised chip evacuation



Shank Ø / insert size	21T 26 1318	21T 26 1319	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws
	GARANT Master Turn boring bar, steel spiral flutes									
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
16/11	eShop	eShop	A16Q SVUCR/L11	VC.. 1103..	20	11	15	31	180	269028 7
20/11	eShop	eShop	A20R SVUCR/L11	VC.. 1103..	24	13	18	36	200	269028 7
25/16	eShop	eShop	A25R SVUCR/L16	VC.. 1604..	31	17	23	40	200	269028 8



Garant A... SVUC 93° boring bars for indexable inserts VC..



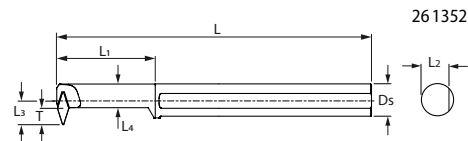
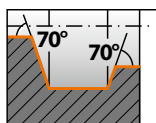
Shank Ø / insert size	21T 26 1348	21T 26 1349	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₁	L	Set of insert screws	Shim	Shim screw
	Boring bar steel											
mm	right-hand	left-hand			mm	mm	mm	mm	mm			
16/11	eShop	eShop	A16Q SVUCR/L11	VC.. 1103..	21	11	15.5	16.5	180	269028 7	—	—
20/11	eShop	eShop	A20R SVUCR/L11	VC.. 1103..	25	13	18	20.5	200	269028 7	—	—
25/16	eShop	eShop	A25R SVUCR/L16	VC.. 1604..	32	17	24	25.5	200	269028 8	—	—
32/16	eShop	eShop	A32S SVUCR/L16	VC.. 1604..	40	22	31	33.5	250	269028 2	269005 8	269013 2
40/16	eShop	eShop	A40T SVUCR/L16	VC.. 1604..	49	27	39	40	300	269028 2	269005 8	269013 2



26



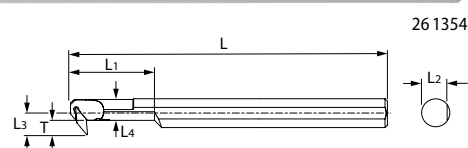
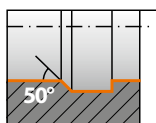
Garant A... SVVC 72.5° boring bars for indexable inserts VC..



Shank Ø / insert size	2T 26 1352	2T 26 1353	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar steel											
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	mm	
8/05	eShop	eShop	A08F SVVCR/L05	VC.. 0501..	10.2	5.5	7.5	3,5	6	15	80	269028 26
10/07	eShop	eShop	A10H SVVCR/L07	VC.. 0702..	13.5	8	9	6	6.8	22	100	269028 27
12/07	eShop	eShop	A12K SVVCR/L07	VC.. 0702..	15.5	9	11	6	9	28	125	269028 27
16/07	eShop	eShop	A16M SVVCR/L07	VC.. 0702..	19.5	11	15	6	12.9	36	150	269028 27
16/11	eShop	eShop	A16M SVVCR/L11	VC.. 1103..	23	14	15.5	9,5	11.9	40	150	269028 22
20/11	eShop	eShop	A20Q SVVCR/L11	VC.. 1103..	25	14	19	9,5	13.9	50	180	269028 22
25/16	eShop	eShop	A25R SVVCR/L16	VC.. 1604..	34	20	23	13	19.5	62.5	200	269028 8



Garant A... SV95C 95° boring bars for indexable inserts VC..



Shank Ø / insert size	2T 26 1354	2T 26 1355	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	T	L ₄	L ₁	L	Set of insert screws
	Boring bar, steel											
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	mm	
8/05	eShop	eShop	A08F SV95CR/L05	VC.. 0501..	9.2	5	7.5	3	6	15	80	269028 26
10/07	eShop	eShop	A10H SV95CR/L07	VC.. 0702..	12.5	7	9	5	6.8	22	100	269028 27
12/07	eShop	eShop	A12K SV95CR/L07	VC.. 0702..	15.5	9	11	6	9	28	125	269028 27
16/07	eShop	eShop	A16M SV95CR/L07	VC.. 0702..	19.5	11	15	5	12.9	36	150	269028 27

Indexable inserts VC..

VC.T precision finishing



Type	HB7025-1	HB7125-1	HU7315-1	
2T 26 1358 VCGT 050102	eShop	eShop	eShop	10
2T 26 1360 Garant VCMT 070202	eShop	eShop	—	10
2T 26 1362 VC.T 070204	eShop	eShop	eShop	10
●	P	M	N	
⚙	SF	VF	AF	
Chip breaker				
Tolerance (26 1358)		G		
Tolerance (26 1360, 26 1362)	M	M	G	
a _p mm	0.05 – 0.4	0.05 – 0.4	0.05 – 1.5	
f mm/rev.	0.03 – 0.2	0.03 – 0.2	0.03 – 0.25	
v _c main application m/min	80 – 190	70 – 180	50 – 600	

VC.T Finishing

Note:

26 1390–1393 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade		HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HU7315-1	HB7315-1	HB7415-1	
2IG 26 1364	VC.T 110302	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1366	VC.T 110304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1370	Garant VC.T 160402	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1372	VC.T 160404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
2IG 26 1374	VC.T 160408	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●		P	P	P	M	M	M	N	N	S	
○		—	—	—	—	—	—	—	—	M	
⊗		⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	
Chip breaker		SS	SS	SS	VS	VS	VS	AF	AF	TIS	
Tolerance		M	M	M	M	M	M	G	G	M	
a_p	mm	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.2 – 1.5	0.05 – 1.5	0.05 – 1.5	0.05 – 1.5	
f	mm/rev.	0.07 – 0.25	0.07 – 0.25	0.07 – 0.25	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.03 – 0.25	0.03 – 0.25	0.05 – 0.3	
v_c main application	m/min	150 – 500	140 – 400	120 – 350	90 – 290	80 – 270	70 – 230	50 – 600	50 – 600	50 – 110	
v_c secondary application	m/min	—	—	—	—	—	—	—	—	70 – 250	



Grade		IC807	
26B 26 1390	ISCAR VCMT 160402	—	10
26B 26 1392	VCMT 160404	—	10
●		P	
⊗		⊗	
Chip breaker		F3P	
a_p	mm	0.1 – 1.8	
f	mm/rev.	0.05 – 0.2	
v_c main application	m/min	50 – 245	

Grade		IC807	
26B 26 1391	ISCAR VCMT 160402	—	10
26B 26 1393	VCMT 160404	—	10
●		M	
⊗		⊗	
Chip breaker		F3M	
a_p	mm	0.1 – 1.8	
f	mm/rev.	0.05 – 0.2	
v_c main application	m/min	30 – 80	

Grade		SP4019	
28D 26 1382	VCGT 110301	eShop	10
28D 26 1383	KENAMETAL VCGT 110302	eShop	10
28D 26 1384	VCGT 110304	eShop	10
●		UNI	
⊗		⊗	
Chip breaker		62	
a_p	mm	0.15 – 3	
f	mm/rev.	0.05 – 0.3	
v_c main application	m/min	30 – 440	



Grade		HBT020	HBT130	
22D 26 1386	HOLEX VCMT 110304	eShop	eShop	10
22D 26 1388	VCMT 160404	eShop	eShop	10
●		P	M	
⊗		⊗	⊗	
Chip breaker		PF	M	
a_p	mm	0.4 – 1.5	0.1 – 1	
f	mm/rev.	0.1 – 0.3	0.05 – 0.2	
v_c main application	m/min	120 – 330	60 – 220	



26

VC.T Medium machining

Note:

26 1481 – The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Grade		CB7010	HB7010-2	HB7020-2	HB7035-2	HB7120-1	HB7130-2	HB7140-2	HU7310	HB7310	HB725-1	HB730-1	
2IG 26 1452	Garant	VCGT 110301	–	–	–	–	–	–	eShop	–	–	–	10
2IG 26 1453		VCGT 110302	–	–	–	–	–	–	eShop	eShop	–	–	10
2IG 26 1454		VC.T 110304	–	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	–	10
2IG 26 1457		VCGT 160402	–	–	–	–	–	–	eShop	eShop	–	–	10
2IG 26 1458		VC.T 160404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–
2IG 26 1459		VC.T 160408	–	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	–	10
●		P	P	P	P	M	M	M	N	N	UNI	UNI	
○		M	–	–	–	–	–	–	–	–	–	–	
⚙		●	●	●	●	●	●	●	●	●	●	●	
Chip breaker		SM	SM	SM	SM	VM	VM	VM	AM	AM	UM1	XUM	
Tolerance		M	M	M	M	M	M	M	G	G	M	M	
a_p	mm	0.2 – 2	0.3 – 2	0.3 – 2	0.3 – 2	0.5 – 2.5	0.5 – 2.5	0.5 – 2.5	0.1 – 4	0.1 – 4	0.2 – 4	0.4 – 4	
f	mm/rev.	0.1 – 0.3	0.08 – 0.3	0.08 – 0.3	0.08 – 0.3	0.1 – 0.4	0.1 – 0.4	0.1 – 0.4	0.05 – 0.5	0.05 – 0.5	0.05 – 0.5	0.15 – 0.25	
v_c main application	m/min	90 – 240	120 – 440	110 – 350	80 – 290	80 – 260	70 – 240	60 – 200	350 – 600	350 – 600	50 – 250	25 – 175	
v_c secondary application	m/min	70 – 180	–	–	–	–	–	–	–	–	–	–	

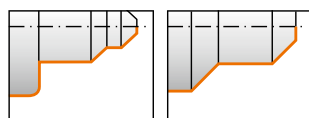


Grade		IC807	
26B 26 1481	VCMT 160404	–	10
●		M	
⚙		●	
Chip breaker		M3M	
a_p	mm	1 – 2.5	
f	mm/rev.	0.07 – 0.25	
v_c main application	m/min	30 – 80	



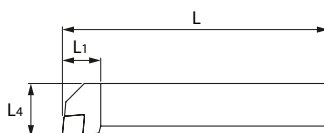
Grade		HBT020	HBT130	
22D 26 1472	VCMT 110304	eShop	eShop	10
22D 26 1474	VCMT 160404	eShop	eShop	10
22D 26 1476	VCMT 160408	eShop	eShop	10
●		P	M	
⚙		●	●	
Chip breaker		PM	MM	
a_p	mm	0.5 – 2.5	0.3 – 2.5	
f	mm/rev.	0.12 – 0.3	0.05 – 0.35	
v_c main application	m/min	100 – 280	50 – 200	

HOLEX Screw-on toolholder sets for indexable inserts CC..

 DIN
ISO 5610


SCLCR/L

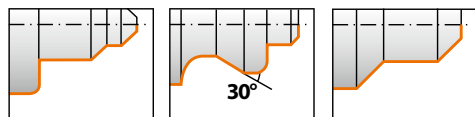
SCSCL/L



26 5110

Shank / insert size	29W	26 5110	29W	26 5111	ISO code toolholder		suitable indexable insert	L ₄	L ₁	L	Spare part
	Screw-on toolholder set				26 5110	26 5111		mm	mm	mm	
mm	right-hand		left-hand								
16	eShop		eShop		SCLCR 1616H09; SCSCL 1616H09	SCLCL 1616H09; SCSCL 1616H09	CC.. 09T3..	20	17	100	269981 4
20	eShop		eShop		SCLCR 2020K09; SCSCL 2020K09	SCLCL 2020K09; SCSCL 2020K09	CC.. 09T3..	25	17	125	269981 4
25	eShop		eShop		SCLCR 2525M12; SCSCL 2525M12	SCLCL 2525M12; SCSCL 2525M12	CC.. 1204..	32	20	150	269981 5

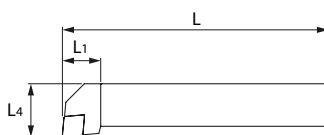
HOLEX Screw-on toolholder sets for indexable inserts CC../DC../SC..

 DIN
ISO 5610


SCLCR/L

SDJCR/L

SSSCL/L

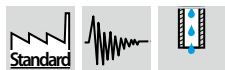


26 5130

Shank / insert size	29W	26 5130	29W	26 5131	ISO code toolholder		suitable indexable insert	L ₄	L ₁	L	Spare part
	Screw-on toolholder set				26 5130	26 5131		mm	mm	mm	
mm	right-hand		left-hand								
10	eShop		eShop		SCLCR 1010E06; SDJCR 1010E07; SSSCL 1010E09	SCLCL 1010E06; SDJCL 1010E07; SSSCL 1010E09	CC.. 0602..; DC.. 0702..; SC.. 09T3	12	10; 13; 21	70	269981 6
12	eShop		eShop		SCLCR 1212F09; SDJCR 1212F07; SSSCL 1212F09	SCLCL 1212F09; SDJCL 1212F07; SSSCL 1212F09	CC.. 09T3..; DC.. 0702..; SC.. 09T3	16	13; 17; 20	80	269981 1
16	eShop		eShop		SCLCR 1616H09; SDJCR 1616H11; SSSCL 1616H12	SCLCL 1616H09; SDJCL 1616H11; SSSCL 1616H12	CC.. 09T3..; DC.. 11T3..; SC.. 1204	20	17; 20; 27	100	269981 2
20	eShop		eShop		SCLCR 2020K09; SDJCR 2020K11; SSSCL 2020K12	SCLCL 2020K09; SDJCL 2020K11; SSSCL 2020K12	CC.. 09T3..; DC.. 11T3..; SC.. 1204	25	17; 20.5; 27	125	269981 2
25	eShop		eShop		SCLCR 2525M12; SDJCR 2525M11; SSSCL 2525M12	SCLCL 2525M12; SDJCL 2525M11; SSSCL 2525M12	CC.. 1204..; DC.. 11T3..; SC.. 1204	32	20; 21.5; 25	150	269981 3



26



Garant GARANT Master Mute A... SCLC 95° vibration-damping boring bars for indexable inserts CC..

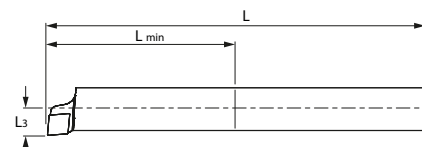
Round shank without clamping face.

Size 06/04–12/06 – Carbide-reinforced shank.

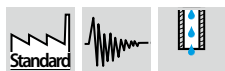
Note: Boring bar can be shortened as far as length L_{min} .
Use **only with internal cooling** (temperature resistance of up to max. 100°C).



26 5008



Shank Ø / insert size	29E 26 5008	29E 26 5009	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L _{min}	L	Set of insert screws	Shim	Shim screw
	GARANT Master Mute boring bar										
	vibration damping										
mm	right-hand	left-hand			mm	mm	mm	mm			
06/04	eShop	eShop	A06X SCLCR/L04	CC.. 0401..	8	3.5	—	96	269028 53	—	—
08/06	eShop	eShop	A08X SCLCR/L06	CC.. 0602..	10	5	—	128	269028 54	—	—
10/06	eShop	eShop	A10X SCLCR/L06	CC.. 0602..	12	6.1	—	161	269028 38	—	—
12/06	eShop	eShop	A12Q SCLCR/L06	CC.. 0602..	16	8.5	—	180	269028 38	—	—
16/06	eShop	eShop	A16X SCLCR/L06	CC.. 0602..	20	11	96	158	269028 38	—	—
20/09	eShop	eShop	A20X SCLCR/L09	CC.. 09T3..	25	13	120	189	269028 50	—	—
25/09	eShop	eShop	A25X SCLCR/L09	CC.. 09T3..	32	17	155	247	269028 50	—	—
32/09	eShop	eShop	A32X SCLCR/L09	CC.. 09T3..	40	22	192	288	269028 50	269005 17	269013 8
40/09	eShop	eShop	A40X SCLCR/L09	CC.. 09T3..	50	27	240	359	269028 50	269005 17	269013 8



Garant GARANT Master Mute A... SDUC 93° vibration-damping boring bars for indexable inserts DC..

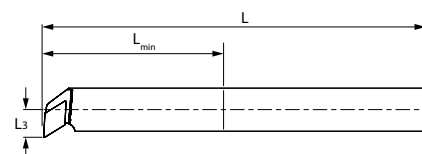
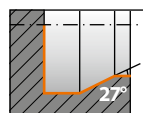
Round shank without clamping face.

Size 08/07–12/07 – Carbide-reinforced shank.

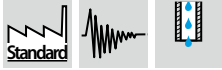
Note: Boring bar can be shortened as far as length L_{min} .
Use **only with internal cooling** (temperature resistance of up to max. 100°C).



26 5014



Shank Ø / insert size	29E 26 5014	29E 26 5015	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L _{min}	L	Set of insert screws	Shim	Shim screw
	GARANT Master Mute boring bar										
	vibration damping										
mm	right-hand	left-hand			mm	mm	mm	mm			
08/07	eShop	eShop	A08X SDUCR/L07	DC.. 0702..	13	8	—	128	269028 38	—	—
10/07	eShop	eShop	A10X SDUCR/L07	DC.. 0702..	15	9	—	161	269028 38	—	—
12/07	eShop	eShop	A12Q SDUCR/L07	DC.. 0702..	16	8.9	—	180	269028 38	—	—
16/07	eShop	eShop	A16X SDUCR/L07	DC.. 0702..	20	11	96	158	269028 38	—	—
20/11	eShop	eShop	A20X SDUCR/L11	DC.. 11T3..	25	13	120	189	269028 50	—	—
25/11	eShop	eShop	A25X SDUCR/L11	DC.. 11T3..	32	17	155	247	269028 50	—	—
32/11	eShop	eShop	A32X SDUCR/L11	DC.. 11T3..	40	22	192	288	269028 50	269005 18	269013 8
40/11	eShop	eShop	A40X SDUCR/L11	DC.. 11T3..	50	27	240	359	269028 50	269005 18	269013 8



Garant GARANT Master Mute A... STFC 90° vibration-damping boring bars for indexable inserts TC..

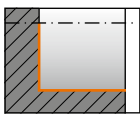
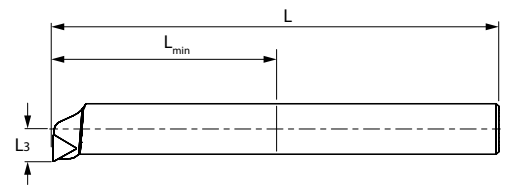
Round shank without clamping face.

Size 10/09; 12/09 – Carbide-reinforced shank.

Note: Boring bar can be shortened as far as length $L_{\min}$.
Use **only with internal cooling** (temperature resistance of up to max. 100°C).



26 5024



Shank $\varnothing$ / insert size	29E 26 5024	29E 26 5025	ISO code toolholder	suitable indexable insert	$\varnothing D_{\min}$	L_3	$L_{\min}$	L	Set of insert screws	Shim	Shim screw
	GARANT Master Mute boring bar										
	vibration damping										
mm	right-hand	left-hand			mm	mm	mm	mm			
10/09	(eShop)	(eShop)	A10X STFCR/L09	TC.. 0902..	13	6.8	—	161	269028 39	—	—
12/09	(eShop)	(eShop)	A12Q STFCR/L09	TC.. 0902..	16	9	—	180	269028 39	—	—
12/11	(eShop)	(eShop)	A12X STFCR/L11	TC.. 1102..	16	9	72	120	269028 38	—	—
16/11	(eShop)	(eShop)	A16X STFCR/L11	TC.. 1102..	20	11	96	158	269028 38	—	—
20/11	(eShop)	(eShop)	A20X STFCR/L11	TC.. 1102..	25	13	120	189	269028 47	—	—
25/11	(eShop)	(eShop)	A25X STFCR/L11	TC.. 1102..	32	17	155	247	269028 47	—	—
32/16	(eShop)	(eShop)	A32X STFCR/L16	TC.. 16T3..	40	22	192	288	269028 50	269005 19	269013 8
40/16	(eShop)	(eShop)	A40X STFCR/L16	TC.. 16T3..	50	27	240	359	269028 50	269005 19	269013 8



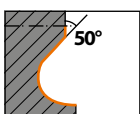
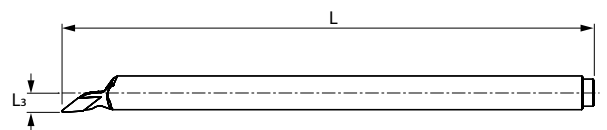
Garant GARANT Master Mute A... SVJC 142° vibration-damping boring bars for indexable inserts VC..

Carbide-reinforced round shank without clamping face.

Note: Use **only with internal cooling** (temperature resistance of up to max. 100°C).



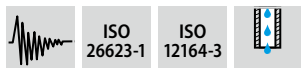
26 5038



Shank $\varnothing$ / insert size	29E 26 5038	29E 26 5039	ISO code toolholder	suitable indexable insert	$\varnothing D_{\min}$	L_3	L	Set of insert screws
	GARANT Master Mute boring bar							
	vibration damping							
mm	right-hand	left-hand			mm	mm	mm	
12/07	eShop	eShop	A12X SVJCR/L07	VC.. 0702..	14	7	189	269028 53



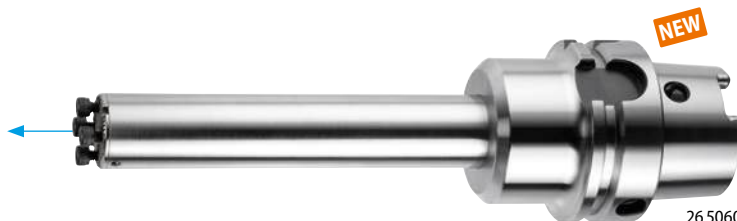
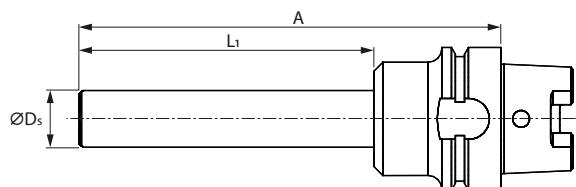
26



Garant GARANT Master Mute vibration-damping boring bar shanks HSK-T / PSC

Suitable for: GARANT Master Mute exchangeable cutting heads No. 265100 – 265377.

Note: The usable length is extended by the length L of the respective exchangeable cutting head. Use **only with internal cooling** (temperature resistance of up to max. 100°C).



26 5060

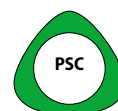
HSK-T 63 holder



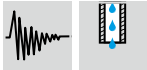
Shank Ø / usable length L ₁	26 5060 GARANT Master Mute boring bar shank HSK-T vibration damping HSK-T 63	Dimension A	Assembly bolt set
mm		mm	
16/64	(eShop)	120	269026 1
16/96	(eShop)	152	269026 1
20/90	(eShop)	146	269026 1
20/130	(eShop)	186	269026 1
25/130	eShop	186	269026 4
25/180	eShop	236	269026 4
25/230	eShop	286	269026 4
32/170	(eShop)	226	269026 5
32/230	(eShop)	286	269026 5
32/294	(eShop)	350	269026 5
40/210	eShop	266	269026 3
40/290	eShop	346	269026 3
40/370	(eShop)	426	269026 3

PSC holder

26 5063–5065 – Shank version Ø 50 mm and Ø 60 mm in right-hand version.
Left-hand version available on request.



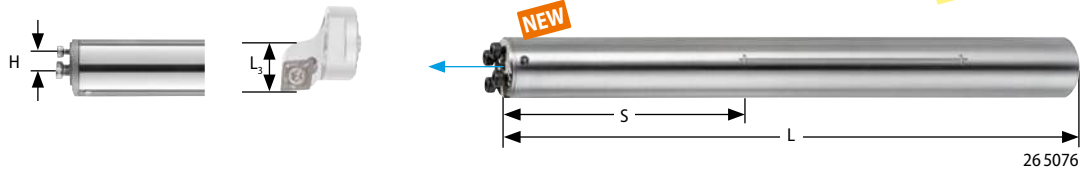
Shank Ø / usable length L ₁	26 5061	26 5062	26 5063	26 5064	26 5065	Dimension A					Assembly bolt set
	GARANT Master Mute boring bar shank PSC vibration damping										
mm	PSC 32	PSC 40	PSC 50	PSC 63	PSC 80	26 5061 mm	26 5062 mm	26 5063 mm	26 5064 mm	26 5065 mm	
16/64	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	99	100	99	102	94	269026 1
16/96	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	131	132	131	134	126	269026 1
20/90	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	125	126	131	128	120	269026 1
20/130	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	165	166	165	168	160	269026 1
25/130	(eShop)	(eShop)	(eShop)	eShop	(eShop)	165	167	165	168	160	269026 4
25/180	(eShop)	(eShop)	(eShop)	eShop	(eShop)	215	216	215	218	210	269026 4
25/230	(eShop)	(eShop)	(eShop)	eShop	(eShop)	265	266	265	268	260	269026 4
32/170	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	205	206	205	208	200	269026 5
32/230	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	265	266	265	268	260	269026 5
32/294	–	(eShop)	(eShop)	(eShop)	(eShop)	–	330	329	332	324	269026 5
40/210	–	(eShop)	(eShop)	eShop	(eShop)	–	246	245	248	240	269026 3
40/290	–	(eShop)	(eShop)	eShop	(eShop)	–	326	325	328	320	269026 3
40/370	–	–	(eShop)	(eShop)	(eShop)	–	–	405	408	400	269026 3
50/270	–	–	(eShop)	(eShop)	(eShop)	–	–	305	308	302	269026 3
50/370	–	–	(eShop)	(eShop)	(eShop)	–	–	405	408	402	269026 3
50/470	–	–	–	(eShop)	(eShop)	–	–	–	508	502	269026 3
60/330	–	–	–	(eShop)	(eShop)	–	–	–	368	362	269026 3
60/450	–	–	–	(eShop)	(eShop)	–	–	–	488	482	269026 3
60/570	–	–	–	–	(eShop)	–	–	–	–	602	269026 3
80/450	–	–	–	–	(eShop)	–	–	–	–	482	269026 3
80/610	–	–	–	–	(eShop)	–	–	–	–	642	269026 3
80/740	–	–	–	–	(eShop)	–	–	–	–	772	269026 3



Garant GARANT Master Mute vibration-damping boring bar shanks

Supplied with: Reducing adaptor for coolant connection.

Note: Do not clamp on the area marked S!
 $D_{\min} = 1/2 \text{ shank } \varnothing + H + \text{cutting head centre-line offset } L_3$
 Usable length = overall length L minus clamping length (recommended = $3 \times D$).
 Use **only with internal cooling** (temperature resistance of up to max. 100°C).



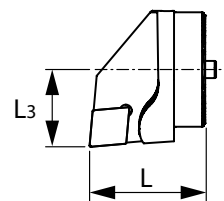
Shank $\varnothing$ / overall length L	29E 26 5076 GARANT Master Mute boring bar shank vibration damping	L	Version	H	S	recommended clamping length	Assembly bolt set
		mm		mm	mm	mm	
16/170	eShop	170	Steel	—	74	48	269026 1
16/204	eShop	204	Carbide-reinforced	—	85	48	269026 1
16/268	(eShop)	268	Carbide-reinforced	—	102	48	269026 1
20/200	eShop	200	Steel	—	84	60	269026 1
20/260	eShop	260	Carbide-reinforced	—	119	60	269026 1
20/340	(eShop)	340	Carbide-reinforced	—	118	60	269026 1
25/255	eShop	255	Steel	—	107	75	269026 4
25/330	eShop	330	Steel	—	125	75	269026 4
25/430	(eShop)	430	Carbide-reinforced	—	145	75	269026 4
32/320	eShop	320	Steel	—	124	96	269026 5
32/416	eShop	416	Steel	—	151	96	269026 5
32/544	(eShop)	544	Carbide-reinforced	—	179	96	269026 5
40/408	eShop	408	Steel	—	144	120	269026 3
40/528	eShop	528	Steel	—	196	120	269026 3
40/668	(eShop)	668	Carbide-reinforced	—	224	120	269026 3
50/518	eShop	518	Steel	5	187	150	269026 3
50/660	eShop	660	Steel	5	269	150	269026 3
50/861	(eShop)	861	Carbide-reinforced	5	269	150	269026 3
60/628	eShop	628	Steel	10	230	180	269026 3
60/808	eShop	808	Steel	10	309	180	269026 3
60/1040	(eShop)	1040	Carbide-reinforced	10	333	180	269026 3



Garant GARANT Master Mute exchangeable cutting heads

For negative indexable inserts

Suitable for: Vibration-damping boring bar shanks No. 265060 – 265076.



Shank $\varnothing$ / insert size	29E 26 5100	29E 26 5101	suitable indexable insert	$\varnothing D_{\min}$	L_3	L	Shim	Shim screw	Clamp	Screw for clamping claw
	GARANT Master Mute exchangeable cutting head									
	DCLN									
	right-hand	left-hand		mm	mm	mm				
40/12	(eShop)	(eShop)	CN.. 1204..	50	27	33	269005 22	269013 9	269038 21	259021 8



Shank $\varnothing$ / insert size	29E 26 5102	29E 26 5103	suitable indexable insert	$\varnothing D_{\min}$	L_3	L	Shim	Lever	Lever screw
	GARANT Master Mute exchangeable cutting head								
	PCLN								
	right-hand	left-hand		mm	mm	mm			
32/12	(eShop)	(eShop)	CN.. 1204..	40	22	26	269005 13	259015 18	259018 19
40/12	(eShop)	(eShop)	CN.. 1204..	50	27	26	269005 13	259015 18	259018 18



26

Shank Ø / insert size	29E 26 5108	29E 26 5109	suitable indexable insert	Ø D _{min}	L ₃	L	Shim	Shim screw	Clamp	Screw for clamping claw
	GARANT Master Mute exchangeable cutting head									
	DDUN									
	right-hand	left-hand		mm	mm	mm				
40/15	eShop	eShop	DN.. 1506..	50	27	33	269005 21	269013 9	259038 21	259021 8



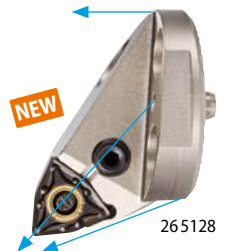
Shank Ø / insert size	29E 26 5114	29E 26 5115	suitable indexable insert	Ø D _{min}	L ₃	L	Shim	Lever	Lever screw
	GARANT Master Mute exchangeable cutting head								
	PDUN								
	right-hand	left-hand		mm	mm	mm			
25/11	eShop	eShop	DN.. 1104..	34	19	23	—	259015 20	259018 20
32/11	eShop	eShop	DN.. 1104..	40	22	26	269005 20	259015 21	259018 19
40/15	eShop	eShop	DN.. 1506..	50	30	26	269005 14	259015 19	259018 18



Shank Ø / insert size	29E 26 5120	29E 26 5121	suitable indexable insert	Ø D _{min}	L ₃	L	Shim	Lever	Lever screw
	GARANT Master Mute exchangeable cutting head								
	PTFN								
	right-hand	left-hand		mm	mm	mm			
32/16	eShop	eShop	TN.. 1604..	40	22	27	269005 15	259015 20	259018 19
40/16	eShop	eShop	TN.. 1604..	50	27	26	269005 15	259015 20	259018 19



Shank Ø / insert size	29E 26 5128	29E 26 5129	suitable indexable insert	Ø D _{min}	L ₃	L	Shim	Lever	Lever screw
	GARANT Master Mute exchangeable cutting head								
	PWLN								
	right-hand	left-hand		mm	mm	mm			
40/08	eShop	eShop	WN.. 0804..	50	27	26	269005 16	259015 18	259018 18



For positive indexable inserts

Suitable for: Vibration-damping boring bar shanks No. 265060 – 265076.

Shank Ø / insert size	29E 26 5202	29E 26 5203	suitable indexable insert	Ø D _{min}	L ₃	L	Insert screw
	GARANT Master Mute exchangeable cutting head						
	SCLC						
	right-hand	left-hand		mm	mm	mm	
16/06	eShop	eShop	CC.. 0602..	20	11	16.5	269028 38
20/09	eShop	eShop	CC.. 09T3..	25	13	19.5	269028 50
25/09	eShop	eShop	CC.. 09T3..	32	17	22	269028 50
32/09	eShop	eShop	CC.. 09T3..	40	22	24	269028 50
40/12	eShop	eShop	CC.. 1204..	50	27	25	269028 49



Shank Ø / insert size	29E 26 5206	29E 26 5207	suitable indexable insert	Ø D _{min}	L ₃	L	Insert screw
	GARANT Master Mute exchangeable cutting head						
	SDQC						
	right-hand	left-hand		mm	mm	mm	
16/07	eShop	eShop	DC.. 0702..	20	11	18	269028 38
20/11	eShop	eShop	DC.. 11T3..	25	13	24	269028 50
25/11	eShop	eShop	DC.. 11T3..	32	17	24	269028 50
32/11	eShop	eShop	DC.. 11T3..	40	22	26	269028 50
40/11	eShop	eShop	DC.. 11T3..	50	27	26	269028 50



Shank Ø / insert size	29E 26 5210	29E 26 5211	suitable indexable insert	Ø D _{min}	L ₃	L	Insert screw
	GARANT Master Mute exchangeable cutting head						
	SDUC						
	right-hand	left-hand		mm	mm	mm	
16/07	eShop	eShop	DC.. 0702..	20	11	16	269028 38
20/11	eShop	eShop	DC.. 11T3..	25	13	20	269028 50
25/11	eShop	eShop	DC.. 11T3..	32	17	22	269028 50
32/11	eShop	eShop	DC.. 11T3..	40	22	27	269028 50
40/11	eShop	eShop	DC.. 11T3..	50	27	32	269028 50



Shank Ø / insert size	29E 26 5214	29E 26 5215	suitable indexable insert	Ø D _{min}	L ₃	L	Insert screw
	GARANT Master Mute exchangeable cutting head						
	SDXC						
	right-hand	left-hand		mm	mm	mm	
16/07	(eShop)	(eShop)	DC.. 0702..	20	13	11	269028 38
20/07	(eShop)	(eShop)	DC.. 0702..	25	15	11	269028 38
25/07	(eShop)	(eShop)	DC.. 0702..	32	18	11	269028 47
32/11	(eShop)	(eShop)	DC.. 11T3..	40	22	13	269028 50
40/11	(eShop)	(eShop)	DC.. 11T3..	50	27	15	269028 50



Shank Ø / insert size	29E 26 5218	29E 26 5219	suitable indexable insert	Ø D _{min}	L ₃	L	Insert screw
	GARANT Master Mute exchangeable cutting head						
	SDNC						
	right-hand	left-hand		mm	mm	mm	
16/07	(eShop)	(eShop)	DC.. 0702..	22	13	12.5	269028 38
20/07	(eShop)	(eShop)	DC.. 0702..	27	15	13	269028 47
25/07	(eShop)	(eShop)	DC.. 0702..	33	18	14	269028 47
32/11	(eShop)	(eShop)	DC.. 11T3..	40	22	17	269028 50
40/11	(eShop)	(eShop)	DC.. 11T3..	50	27	17	269028 50



Shank Ø / insert size	29E 26 5222	29E 26 5223	suitable indexable insert	Ø D _{min}	L ₃	L	Insert screw
	GARANT Master Mute exchangeable cutting head						
	STFC						
	right-hand	left-hand		mm	mm	mm	
20/11	(eShop)	(eShop)	TC.. 1103..	25	13	20	269028 47
25/11	(eShop)	(eShop)	TC.. 1103..	32	17	22	269028 47
32/16	(eShop)	(eShop)	TC.. 16T3..	40	22	27	269028 50
40/16	(eShop)	(eShop)	TC.. 16T3..	50	27	32	269028 50



Shank Ø / insert size	29E 26 5226	29E 26 5227	suitable indexable insert	Ø D _{min}	L ₃	L	Insert screw
	GARANT Master Mute exchangeable cutting head						
	SVUC						
	right-hand	left-hand		mm	mm	mm	
16/11	eShop	eShop	VC.. 1103..	25	16	17	269028 38
20/11	eShop	eShop	VC.. 1103..	27	15	20.5	269028 47
25/11	eShop	eShop	VC.. 1103..	33	18	20.5	269028 47
32/16	eShop	eShop	VC.. 1604..	40	22	25	269028 50
40/16	eShop	eShop	VC.. 1604..	50	27	28	269028 50



Shank Ø / insert size	29E 26 5230	29E 26 5231	suitable indexable insert	Ø D _{min}	L ₃	L	Insert screw
	GARANT Master Mute exchangeable cutting head						
	SVXC						
	right-hand	left-hand		mm	mm	mm	
16/11	(eShop)	(eShop)	VC.. 1103..	25	16	8	269028 38



For thread turning inserts

Size 16/11–20/16 – With fixed 1.5° inclination angle.

Size 25/16–40/22 – With shim 1.5°.

Note: Matching thread turning inserts No. 270700 - 270984.

Shank Ø / insert size	29E 26 5302	29E 26 5303	matching thread turning insert		Ø D _{min}	L ₃	L	Insert screw
	GARANT Master Mute exchangeable cutting head for thread turning inserts		26 5302	26 5303				
	right-hand	left-hand			mm	mm	mm	
16/11	(eShop)	(eShop)	11IR	11IL	20	10.4	20	269028 38
20/11	(eShop)	(eShop)	11IR	11IL	25	12.7	20	269028 38
16/16	(eShop)	(eShop)	16IR	16IL	20	10.4	20	269028 50
20/16	eShop	(eShop)	16IR	16IL	25	13.7	23	269028 52
25/16	eShop	(eShop)	16IR	16IL	30	16.3	24	269028 52
32/16	eShop	(eShop)	16IR	16IL	37	19.7	28	269028 50
40/16	eShop	(eShop)	16IR	16IL	45	23.7	28	269028 50
25/22	eShop	(eShop)	22IR	22IL	32	18.3	30	269028 51
32/22	eShop	(eShop)	22IR	22IL	39	21.7	32	269028 51
40/22	eShop	(eShop)	22IR	22IL	47	25.7	30	269028 51



26

For diamond burnishing

Diamond burnishing tool for material classes P, M, K, N and S.

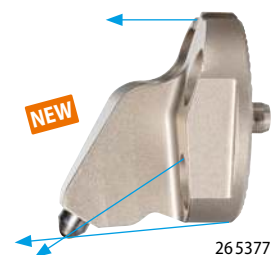
Cutting data: Cutting speed v_c = value of finish machining (start value).
Reduce the cutting speed step by step if vibrations occur.
Feed rate f = 70% of the value of the finish machining (start value).
Infeed a_p = 0.1 mm (start value) up to a maximum of 0.2 mm.

Function: The pressure of the diamond burnishing tip produces a material flow from the near-surface material layer.

Application: For surface machining up to $R_a = 0.3 \mu\text{m}$ on materials up to 65 HRC.

Supplied with: Includes diamond burnishing tip and clamping screw.

Note: A surface quality of at least $R_a = 1.6 \mu\text{m}$ is recommended by way of preparation.



Shank $\varnothing$ / insert size	265377	$\varnothing D_{\min}$	L_3	L	Clamping screw	Diamond burnishing tip
	GARANT Master Mute exchangeable cutting head for diamond burnishing	mm	mm	mm		
20	(eShop)	24	12	21	269024 2	269016 1
25	(eShop)	30	16	25	269024 2	269016 1
32	(eShop)	38	20	33	269024 2	269016 1
40	(eShop)	46	24	34	269024 2	269016 1



SWISS TOOLS

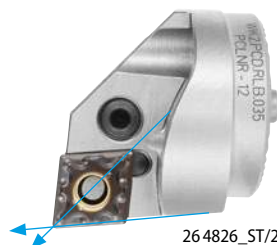
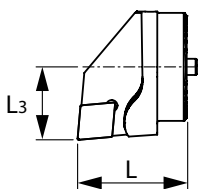
Exchangeable cutting heads

Suitable for: Boring bar shanks No. 265060 – 265065 and 265076 (GARANT).
Boring bar shanks No. 320102, 320104, 320407, 320409 and 320410 (SwissTools).

Spare part:

Size ST/10–ST/15 – Insert screw on request.

HP
ready



System / insert size		ST/1	ST/2	ST/3	ST/4	ST/5	ST/6	ST/7	ST/8	ST/9
29D 264826	right-hand	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
29D 264827	left-hand	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
Cutting point / joint	mm	25	32	40	32	40	25	32	40	25
ISO code cutting head (264826)		PCLNR	PCLNR	PCLNR	PDUNR	PDUNR	SCLCR	SCLCR	SCLCR	SDQCR
ISO code cutting head (264827)		PCLNL	PCLNL	PCLNL	PDUNL	PDUNL	SCLCL	SCLCL	SCLCL	SDQCL
suitable indexable insert		CN.. 1204..	CN.. 1204..	CN.. 1204..	DN.. 1506..	DN.. 1506..	CC.. 1204..	CC.. 1204..	CC.. 1204..	DC.. 11T3..
Approach angle	degrees	95	95	95	93	93	95	95	95	107.5
$\varnothing D_{\min}$	mm	32	40	50	40	50	32	40	50	32
L_3	mm	17	22	27	22	27	17	22	27	17
L	mm	35	35	40	35	40	35	35	40	35
Lever		320612 P01	320612 P01	320612 P01	320612 P05	320612 P05	–	–	–	–
Lever screw		320611 P01	320611 P01	320611 P01	320611 P05	320611 P05	–	–	–	–
Pin		320618 P01	320618 P01	320618 P01	320618 P05	320618 P05	–	–	–	–
Shim		320610 P01	320610 P01	320610 P01	320610 P05	320610 P05	–	–	–	–
Insert screw		–	–	–	–	–	320620 S01	320620 S01	320620 S01	320626 S05/07

System / insert size		ST/10	ST/11	ST/12	ST/13	ST/14	ST/15	ST/16	ST/17
29D 264826	right-hand	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
29D 264827	left-hand	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
Cutting point / joint	mm	32	40	25	32	40	25	32	40
ISO code cutting head (264826)		SDQCR	SDQCR	SDUCR	SDUCR	SDUCR	SVQBR	SVQBR	SVQBR
ISO code cutting head (264827)		SDQCL	SDQCL	SDUCL	SDUCL	SDUCL	SVQBL	SVQBL	SVQBL
suitable indexable insert		DC.. 11T3..	DC.. 11T3..	DC.. 11T3..	DC.. 11T3..	DC.. 11T3..	VB.. 1103..	VB.. 1604..	VB.. 1604..
Approach angle	degrees	107.5	107.5	93	93	93	107.5	107.5	107.5
$\varnothing D_{\min}$	mm	40	50	32	40	50	32	40	50
L_3	mm	22	27	17	22	27	17	22	27
L	mm	35	40	35	35	40	35	35	40
Insert screw		–	–	–	–	–	–	320626 S05/07	320626 S05/07

Garant Indexable inserts CBN (5° / 7°)

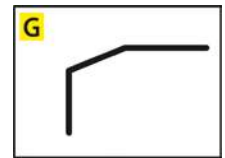
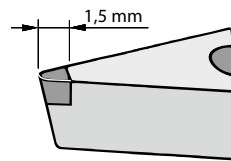
Innovative „all-in-one“ concept, to reduce the variety of items you hold in stock and give you the flexibility in production that you need.
 New type of CBN with a balanced combination of wear-resistance and tensile strength for general-purpose use in hardened steel up to 67 HRC in combination with a special chamfered profile.
 For use both in continuous cutting and also in slightly interrupted cutting and heavily interrupted cutting.
SIMPLE. FAST. ALWAYS THE RIGHT CHOICE.

**Garant Indexable inserts CBN (5° / 7°)**

26 5403–5442/5457–5484 – Fitted with 2 cutters.

26 5445–5454 – Fitted with 3 cutters.

Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	M	M	S	K	N	N					
BU7220										●	●	●							●	●	●		●



Cutting edge (chamfered).
 Chamfering generally
 applicable for steel up to
 67 HRC. Also for heavily
 interrupted cutting.

Cutting edge version	G		
21H 26 5403	CCGW 060202	BU7220	eShop
21H 26 5406	CCGW 060204	BU7220	eShop
21H 26 5409	CCGW 060208	BU7220	eShop
21H 26 5412	CCGW 09T302	BU7220	eShop
21H 26 5415	CCGW 09T304	BU7220	eShop
21H 26 5418	CCGW 09T308	BU7220	eShop
21H 26 5421	CCGW 120404	BU7220	eShop
21H 26 5424	CCGW 120408	BU7220	eShop
21H 26 5426	DCGW 04T001	BU7220	eShop
21H 26 5427	DCGW 070202	BU7220	eShop
21H 26 5430	DCGW 070204	BU7220	eShop
21H 26 5433	DCGW 070208	BU7220	eShop
21H 26 5436	DCGW 11T302	BU7220	eShop
21H 26 5439	DCGW 11T304	BU7220	eShop
21H 26 5442	DCGW 11T308	BU7220	eShop
21H 26 5445	TCGW 110202	BU7220	eShop
21H 26 5448	TCGW 110204	BU7220	eShop
21H 26 5451	TCGW 16T304	BU7220	eShop
21H 26 5454	TCGW 16T308	BU7220	eShop
21H 26 5457	VBGW 110302	BU7220	eShop
21H 26 5460	VBGW 110304	BU7220	eShop
21H 26 5463	VBGW 160402	BU7220	eShop
21H 26 5466	VBGW 160404	BU7220	eShop
21H 26 5469	VBGW 160408	BU7220	eShop
21H 26 5470	VCGW 050101	BU7220	eShop
21H 26 5472	VCGW 110302	BU7220	eShop
21H 26 5475	VCGW 110304	BU7220	eShop
21H 26 5478	VCGW 160402	BU7220	eShop
21H 26 5481	VCGW 160404	BU7220	eShop
21H 26 5484	VCGW 160408	BU7220	eShop
a _p	mm		0.03 – 0.12
f	mm/rev.		0.04 – 0.12
v _c main application	m/min		120 – 160



26 5412



26 5442



26 5454



26 5466



26 5475



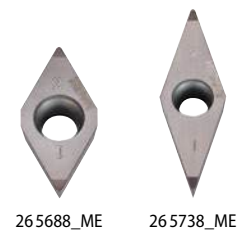
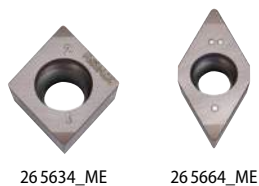
26

KYOCERA Indexable inserts CBN (5° / 7°)

MEGACOAT coated CBN inserts.

Size ME – MultiEdge; 2 cutting edges per insert.

Size MET – MultiEdge Tough; 2 cutting edges per insert, with special honing for optimisation of interrupted cutting.



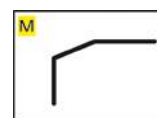
Type			ME	MET
25H 26 5606	CCMW 060202	KBN05M	eShop	–
25H 26 5608		KBN25M	eShop	–
25H 26 5610		KBN35M	eShop	–
25H 26 5612	CCMW 060204	KBN05M	eShop	–
25H 26 5614		KBN25M	eShop	–
25H 26 5616		KBN35M	eShop	–
25H 26 5620	CCMW 060208	KBN25M	eShop	–
25H 26 5626	CCMW 09T302	KBN05M	eShop	–
25H 26 5628		KBN25M	eShop	–
25H 26 5632	CCMW 09T304	KBN05M	eShop	–
25H 26 5634		KBN25M	eShop	eShop
25H 26 5636		KBN35M	eShop	eShop
25H 26 5638	CCMW 09T308	KBN05M	eShop	–
25H 26 5640		KBN25M	eShop	eShop
25H 26 5642		KBN35M	eShop	eShop
25H 26 5656	DCMW 070202	KBN05M	eShop	–
25H 26 5658		KBN25M	eShop	eShop
25H 26 5662	DCMW 070204	KBN05M	eShop	–
25H 26 5664		KBN25M	eShop	eShop
a_p	mm	0.05 – 0.5		
f	mm/rev.	0.08 – 0.15		
v_c main application	m/min	120 – 200		

Type			ME	MET
25H 26 5680	DCMW 11T302	KBN05M	eShop	–
25H 26 5682		KBN25M	eShop	eShop
25H 26 5684		KBN35M	eShop	–
25H 26 5686	DCMW 11T304	KBN05M	eShop	–
25H 26 5688		KBN25M	eShop	eShop
25H 26 5690		KBN35M	–	eShop
25H 26 5692	DCMW 11T308	KBN05M	eShop	–
25H 26 5694		KBN25M	eShop	eShop
25H 26 5696		KBN35M	eShop	eShop
25H 26 5730	VBGW 160402	KBN05M	eShop	–
25H 26 5732		KBN25M	eShop	eShop
25H 26 5734	VBGW 160404	KBN35M	eShop	–
25H 26 5736		KBN05M	eShop	–
25H 26 5738		KBN25M	eShop	eShop
25H 26 5740	VBGW 160408	KBN35M	eShop	eShop
25H 26 5742		KBN05M	eShop	–
25H 26 5744		KBN25M	eShop	eShop
25H 26 5746		KBN35M	–	eShop
a_p	mm	0.05 – 0.5		
f	mm/rev.	0.08 – 0.15		
v_c main application	m/min	120 – 200		

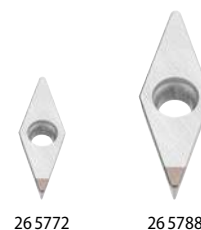
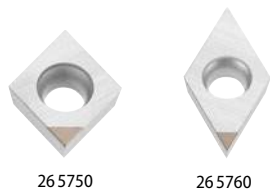
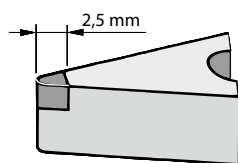
HOLEX Indexable inserts CBN (5° / 7°)

- Disposable insert.
- Single cutting edge.

Note: Further indexable insert shapes, sizes and corner radii available on request.



Cutting edge (chamfered).
Chamfering even for
slightly interrupted cutting.



Cutting edge version			M
221 26 5750	CCMW 060202	BUX220	eShop
221 26 5752		BUX220	eShop
221 26 5754		BUX220	eShop
221 26 5756	CCMW 09T302	BUX220	eShop
221 26 5758	CCMW 09T304	BUX220	eShop
221 26 5760	CCMW 09T308	BUX220	eShop
221 26 5762	DCMW 070202	BUX220	eShop
221 26 5764	DCMW 070204	BUX220	eShop
221 26 5766	DCMW 070208	BUX220	eShop
221 26 5768	DCMW 11T302	BUX220	eShop
221 26 5770	DCMW 11T304	BUX220	eShop
221 26 5772	DCMW 11T308	BUX220	eShop
a_p	mm	0.1 – 0.5	
f	mm/rev.	0.1 – 0.2	
v_c main application	m/min	80 – 200	

Cutting edge version			M
221 26 5772	VBMW 110302	BUX220	eShop
221 26 5774		BUX220	eShop
221 26 5776		BUX220	eShop
221 26 5778	VBMW 160402	BUX220	eShop
221 26 5780	VBMW 160404	BUX220	eShop
221 26 5782	VBMW 160408	BUX220	eShop
221 26 5784	VBMW 110302	BUX220	eShop
221 26 5786	VBMW 110304	BUX220	eShop
221 26 5788	VBMW 160402	BUX220	eShop
221 26 5790	VBMW 160404	BUX220	eShop
221 26 5792	VBMW 160408	BUX220	eShop
a_p (26 5772, 26 5774, 26 5776, 26 5778, 26 5780)	mm	0.1 – 0.5	
a_p (26 5782, 26 5784, 26 5786, 26 5788, 26 5790)	mm	0.1 – 0.25	
f	mm/rev.	0.1 – 0.2	
v_c main application	m/min	80 – 200	



Garant Indexable inserts MCD

MCD - mono-crystalline diamond, laser-profiled cutting edges.

Universal chamfering (NU) for all non-ferrous metals and synthetic materials (PMMA, POM, acrylic etc.).

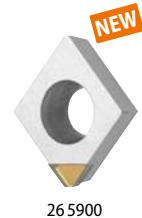
Application: For very fine machining for the best finishing surfaces.

Recommendation: For the best results, use the GARANT Master Eco system.
Alternatively all suitable ISO tool holders and boring bars can be used.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	Ti > 850 N	Cu	CuZn	GRP CRP	Graphite					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	S	N	N	N	N					
26 5899 NU – 26 6016 NU	●	●	○	●	●	○	○		○	●	●			○	●	●	○	●	○	○	○	●	●

CCGW

Cutting edge version			NU
21L 26 5899	CCGW 060202 FN	MCD	eShop
21L 26 5900	CCGW 060204 FN	MCD	eShop
21L 26 5904	CCGW 060208 FN	MCD	eShop
21L 26 5905	CCGW 09T302 FN	MCD	eShop
21L 26 5916	CCGW 09T304 FN	MCD	eShop
21L 26 5920	CCGW 09T308 FN	MCD	eShop
a_p	mm		0.01 – 0.2
f	mm/rev.		0.005 – 0.2
v_c main application	m/min		100 – 1400



26 5900

DCGW

Cutting edge version			NU
21L 26 5921	DCGW 070202 FN	MCD	eShop
21L 26 5948	DCGW 070204 FN	MCD	eShop
21L 26 5964	DCGW 11T304 FN	MCD	eShop
a_p	mm		0.01 – 0.2
f	mm/rev.		0.005 – 0.2
v_c main application	m/min		100 – 1400



26 5948

VBGW

Cutting edge version			NU
21L 26 6001	VBGW 110302 FN	MCD	eShop
21L 26 6010	VBGW 110304 FN	MCD	eShop
21L 26 6016	VBGW 160404 FN	MCD	eShop
a_p	mm		0.01 – 0.2
f	mm/rev.		0.005 – 0.2
v_c main application	m/min		100 – 1400



26 6016

VCGW

Cutting edge version			NU
21L 26 5965	VCGW 110302 FN	MCD	eShop
21L 26 5980	VCGW 110304 FN	MCD	eShop
21L 26 5996	VCGW 160404 FN	MCD	eShop
a_p	mm		0.01 – 0.2
f	mm/rev.		0.005 – 0.2
v_c main application	m/min		100 – 1400



26 5980



26

Garant Indexable inserts PCD (7°)

PCD – Polycrystalline diamond, fine grain.

Size N – Neutral, without chip breaker.

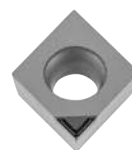
Size TWF – Finishing, sharp edges for low cutting pressure.

Size TWM – General machining, stable cutting edge for high metal removal rates.

Size TWN – Roughing, stable cutting edge for large cutting depths.

Application: For aluminium, aluminium alloys, non-ferrous metals, plastics, composite materials, titanium alloys, sintered metals.

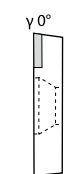
Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Graphite	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N	N					
N	○	●	●													●	●	●	●	●	●	●	●
TWF	●	●	●													●	●	●	●	●	●	●	●
TWM	●	●	●											○		●	●	●	●	●	●	●	●



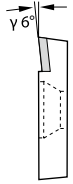
Cutting edge version		N	TWF	TWM	Rake degrees
21L 26 5802	CCGT 060202 FN	PCD	eShop	eShop	6
21L 26 5807	CCGT 060204 FN	PCD	eShop	eShop	6
21L 26 5812	CCGT 09T302 FN	PCD	eShop	eShop	6
21L 26 5817	CCGT 09T304 FN	PCD	eShop	eShop	6
21L 26 5827	CCGT 120404 FN	PCD	eShop	eShop	6
a_p (26 5802, 26 5812)	mm	0.1 – 2.5	0.1 – 1	0.2 – 2.5	
a_p (26 5807, 26 5817, 26 5827)	mm	0.1 – 2.5	0.3 – 1	0.2 – 2.5	
f	mm/rev.	0.03 – 0.4	0.03 – 0.2	0.05 – 0.3	
Alu < 10 % Si: v_c	m/min	300 – 2000	400 – 3500	400 – 3500	
NF metals: v_c	m/min	300 – 1500	–	300 – 2200	
G(C)FK: v_c	m/min	150 – 600	400 – 900	400 – 900	



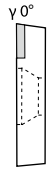
Cutting edge version		TWN	Rake degrees
21L 26 5823	CCGT 09T308 FR GS right-hand	PCD	eShop
21L 26 5824	CCGT 09T308 FL GS left-hand	PCD	eShop
a_p	mm	0.5 – 7.5	
f	mm/rev.	0.05 – 0.5	
Alu < 10 % Si: v_c	m/min	400 – 3500	
NF metals: v_c	m/min	300 – 2200	
G(C)FK: v_c	m/min	400 – 900	



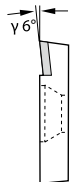
Cutting edge version		N	Rake degrees
21L 26 5800	CCGW 060202 FN	PCD	eShop
21L 26 5805	CCGW 060204 FN	PCD	eShop
21L 26 5810	CCGW 09T302 FN	PCD	eShop
21L 26 5815	CCGW 09T304 FN	PCD	eShop
21L 26 5826	CCGW 120404 FN	PCD	eShop
a_p	mm	0.1 – 2.5	
f	mm/rev.	0.03 – 0.4	
Alu < 10 % Si: v_c	m/min	300 – 2000	
NF metals: v_c	m/min	300 – 1500	
G(C)FK: v_c	m/min	150 – 600	



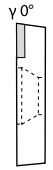
Cutting edge version				N	TWF	TWM	Rake degrees
21L	26 5832	DCGT 070202 FN	PCD	eShop	eShop	eShop	6
21L	26 5837	DCGT 070204 FN	PCD	eShop	eShop	eShop	6
21L	26 5847	DCGT 11T302 FN	PCD	eShop	eShop	eShop	6
21L	26 5852	DCGT 11T304 FN	PCD	eShop	eShop	eShop	6
a_p (26 5832, 26 5847)		mm		0.1 – 2.5	0.1 – 1	0.2 – 2.5	
a_p (26 5837, 26 5852)		mm		0.1 – 2.5	0.3 – 1	0.2 – 2.5	
f		mm/rev.		0.03 – 0.4	0.03 – 0.2	0.05 – 0.3	
Alu < 10 % Si: v_c		m/min		300 – 2000	400 – 3500	400 – 3500	
NF metals: v_c		m/min		300 – 1500	–	300 – 2200	
G(C)FK: v_c		m/min		150 – 600	400 – 900	400 – 900	



Cutting edge version				N	Rake degrees
21L	26 5829	DCGW 04T001 FN	PCD	eShop	0
21L	26 5830	DCGW 070202 FN	PCD	eShop	0
21L	26 5835	DCGW 070204 FN	PCD	eShop	0
21L	26 5845	DCGW 11T302 FN	PCD	eShop	0
21L	26 5850	DCGW 11T304 FN	PCD	eShop	0
a_p		mm		0.1 – 2.5	
f		mm/rev.		0.03 – 0.4	
Alu < 10 % Si: v_c		m/min		300 – 2000	
NF metals: v_c		m/min		300 – 1500	
G(C)FK: v_c		m/min		150 – 600	



Cutting edge version				N	TWF	TWM	Rake degrees
21L	26 5872	VCGT 110301 FN	PCD	eShop	eShop	–	6
21L	26 5877	VCGT 110302 FN	PCD	eShop	eShop	eShop	6
21L	26 5882	VCGT 110304 FN	PCD	eShop	eShop	eShop	6
21L	26 5892	VCGT 160402 FN	PCD	eShop	eShop	eShop	6
21L	26 5897	VCGT 160404 FN	PCD	eShop	eShop	eShop	6
a_p (26 5872)		mm		0.1 – 2.5	0.05 – 0.5	–	
a_p (26 5877, 26 5892)		mm		0.1 – 2.5	0.1 – 1	0.2 – 2.5	
a_p (26 5882, 26 5897)		mm		0.1 – 2.5	0.3 – 1	0.2 – 2.5	
f		mm/rev.		0.03 – 0.4	0.03 – 0.2	0.05 – 0.3	
Alu < 10 % Si: v_c		m/min		300 – 2000	400 – 3500	400 – 3500	
NF metals: v_c		m/min		300 – 1500	–	300 – 2200	
G(C)FK: v_c		m/min		150 – 600	400 – 900	400 – 900	



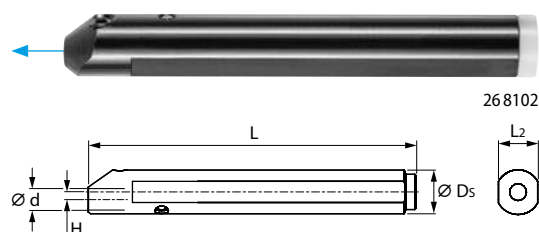
Cutting edge version				N	Rake degrees
21L	26 5870	VCGW 050101 FN	PCD	eShop	0
21L	26 5875	VCGW 110302 FN	PCD	eShop	0
21L	26 5880	VCGW 110304 FN	PCD	eShop	0
21L	26 5895	VCGW 160404 FN	PCD	eShop	0
a_p		mm		0.1 – 2.5	
f		mm/rev.		0.03 – 0.4	
Alu < 10 % Si: v_c		m/min		300 – 2000	
NF metals: v_c		m/min		300 – 1500	
G(C)FK: v_c		m/min		150 – 600	





Garant Holder for quick-change boring bars

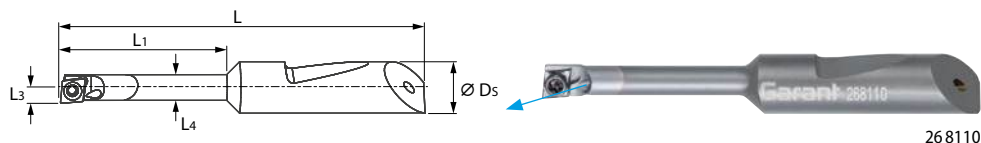
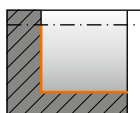
With through-coolant and coolant transfer ring. Precise clamping system for quick, repeatable boring bar changes ensuring accurate positioning.



Shank dia. D_s	21P 26 8102	21P 26 8103	$\varnothing D_s$	L	$\varnothing d$	H	L_2	Clamping screw
mm	right-hand	left-hand	mm	mm	mm	mm	mm	
16	eShop	eShop	16	120	8	2.8	14	269024 1



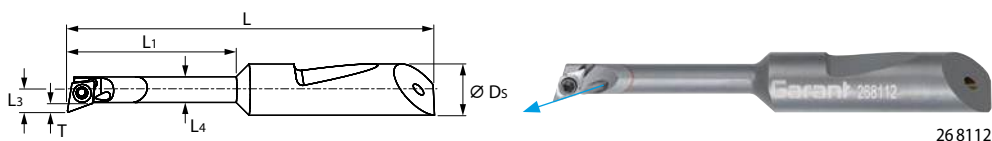
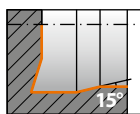
Garant E... SCLC 95° quick-change boring bars for indexable inserts CC..



Shank $\varnothing D_s$ / insert size	21P 26 8110	21P 26 8111	ISO code toolholder	suitable indexable insert	$\varnothing D_{min}$	L_3	L_4	L_1	L	Set of insert screws
mm	right-hand	left-hand			mm	mm	mm	mm	mm	
8/03	eShop	eShop	E08X SCLCR/L03	CC.. 0301..	5	2.5	4	26	57	269028 13



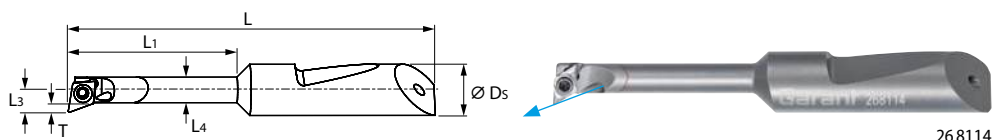
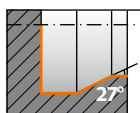
Garant E... SDQC 107.5° quick-change boring bars for indexable inserts DC..



Shank dia. D_s / insert size	21P 26 8112	21P 26 8113	ISO code toolholder	suitable indexable insert	$\varnothing D_{min}$	L_3	T	L_4	L_1	L	Set of insert screws
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	
8/04	eShop	eShop	E08X SDQCR/L04	DC.. 04T0..	5.2	2.6	1.1	4	26	57	269028 26



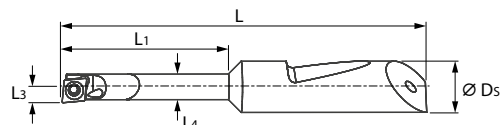
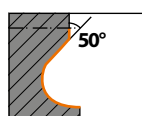
Garant E... SDUC 93° quick-change boring bars for indexable inserts DC..



Shank $\varnothing D_s$ / insert size	21P 26 8114	21P 26 8115	ISO code toolholder	suitable indexable insert	$\varnothing D_{min}$	L_3	T	L_4	L_1	L	Set of insert screws
mm	right-hand	left-hand			mm	mm	mm	mm	mm	mm	
8/04	eShop	eShop	E08X SDUCR/L04	DC.. 04T0..	5.6	3	1.5	4	26	57	269028 26



Garant E... SVJC 142° quick-change boring bars for indexable inserts VC..

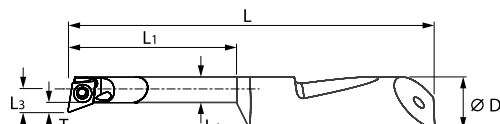
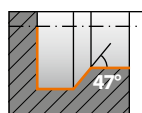


26 8116

Shank dia. D _s / insert size	2IP	26 8116	2IP	26 8117	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₄	L ₁	L	Set of insert screws
		Quick-change boring bar carbide										
mm		right-hand		left-hand			mm	mm	mm	mm	mm	
8/05		eShop		eShop	E08X SVJCR/L05	VC.. 0501..	5.5	2	4	26	57	269028 26



Garant E... SVLC 95° quick-change boring bars for indexable inserts VC..

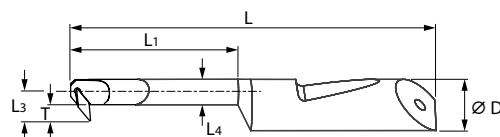
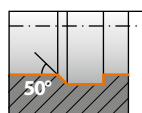


26 8120

Shank dia. D _s / insert size	2IP	26 8120	2IP	26 8121	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	T	L ₄	L ₁	L	Set of insert screws
		Quick-change boring bar carbide											
mm		right-hand		left-hand			mm	mm	mm	mm	mm	mm	
8/05		eShop		eShop	E08X SVLCR/L05	VC.. 0501..	9.2	5	3	6	26	57	269028 26



Garant E... SV95C 95° quick-change boring bars for indexable inserts VC..



26 8122

Shank dia. D _s / insert size	2IP	26 8122	2IP	26 8123	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	T	L ₄	L ₁	L	Set of insert screws
		Quick-change boring bar carbide											
mm		right-hand		left-hand			mm	mm	mm	mm	mm	mm	
8/05		eShop		eShop	E08X SV95CR/L05	VC.. 0501..	9.2	5	3	6	26	57	269028 26

Garant Indexable inserts for quick-change boring bars

Size G – CBN version.

Size N – PCD version.

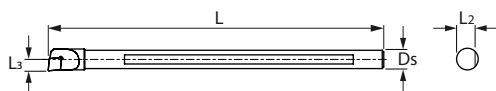
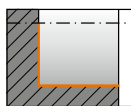


Grade		HB7025-1	HB7125-1	HU7315-1	
21H 26 8090	CCGT 030101	eShop	eShop	eShop	10
21H 26 8091	CCGT 030102	eShop	eShop	eShop	10
21G 26 8094	DCGT 04T002	eShop	eShop	eShop	10
21L 26 8095	VCGT 050102	eShop	eShop	eShop	10
●		P	M	N	
⚙		SF	VF	AF	
Chip breaker					
a _p	mm	0.05 – 0.4	0.05 – 0.4	0.05 – 1.5	
f	mm/rev.	0.03 – 0.3	0.03 – 0.2	0.03 – 0.25	
v _c main application	m/min	80 – 180	70 – 150	50 – 300	

Cutting edge version		G	N
21H 26 8096	DCGW 04T001	eShop	—
21H 26 8097	VCGW 050101	eShop	—
21L 26 8098	DCGW 04T001	—	eShop
21L 26 8099	VCGW 050101	—	eShop
●		H	N
⚙			
a _p	mm	0.03 – 0.08	0.05 – 1
f	mm/rev.	0.04 – 0.06	0.03 – 0.035
v _c main application	m/min	80 – 140	120 – 800

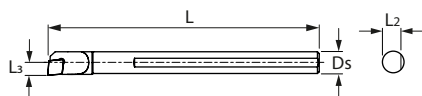
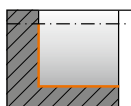


26


Garant E... SCLD 95° / 97° boring bars for indexable inserts CDCT S4010.


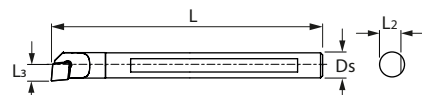
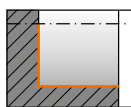
268712

Overhang / insert size	21V 26 8712	21V 26 8716	Ø D _s	ISO code toolholder	Setting angle κ	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
	Boring bar carbide										
mm	right-hand	left-hand	mm		degrees		mm	mm	mm	mm	
60/S4	eShop	eShop	4	E04G SCLDR/LS4	97	CDCT S4010.	4.57	2.5	3.58	90	269028 10
65/S4	eShop	eShop	5	E05H SCLDR/LS4	95	CDCT S4010.	5.94	3	4.6	100	269028 10
75/S4	eShop	eShop	6	E06J SCLDR/LS4	95	CDCT S4010.	6.91	3.5	5.54	110	269028 10
85/S4	eShop	eShop	8	E08K SCLDR/LS4	95	CDCT S4010.	9.05	4.5	7.49	125	269028 10


Garant AH... SCLD 95° / 97° boring bars for indexable inserts CDCT S4010.


268702

Overhang / insert size	21V 26 8702	21V 26 8706	Ø D _s	ISO code toolholder	Setting angle κ	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
	Boring bar HSS										
mm	right-hand	left-hand	mm		degrees		mm	mm	mm	mm	
45/S4	eShop	eShop	4	AH04X SCLDR/LS4	97	CDCT S4010.	4.57	2.5	3.58	65	269028 10
46/S4	eShop	eShop	5	AH05X SCLDR/LS4	95	CDCT S4010.	5.78	3	4.6	65	269028 10
50/S4	eShop	eShop	6	AH06X SCLDR/LS4	95	CDCT S4010.	6.92	3.5	5.54	75	269028 10
66/S4	eShop	eShop	8	AH08H SCLDR/LS4	95	CDCT S4010.	9.05	4.5	7.49	100	269028 10


Garant A... SCLD 95° / 97° boring bars for indexable inserts CDCT S4010.


268717

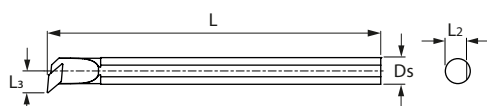
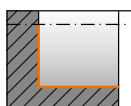
Shank Ø / insert size	21V 26 8717	21V 26 8718	Ø D _s	ISO code toolholder	Setting angle κ	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
	Boring bar, steel										
mm	right-hand	left-hand	mm		degrees		mm	mm	mm	mm	
4/S4	eShop	eShop	4	A04X SCLDR/LS4	97	CDCT S4010.	4.57	2.41	3.58	65	269028 10
5/S4	eShop	eShop	5	A05X SCLDR/LS4	95	CDCT S4010.	5.78	2.95	4.6	65	269028 10
6/S4	eShop	eShop	6	A06X SCLDR/LS4	95	CDCT S4010.	6.92	3.73	5.54	65	269028 10
8/S4	eShop	eShop	8	A08X SCLDR/LS4	95	CDCT S4010.	9.05	4.7	7.49	76	269028 10

Garant Indexable inserts CDCT S4010.


Grade	HB7035	HB7125-1	HU7310	HB7410	
21V 26 8520 CDCT S40101	eShop	eShop	eShop	eShop	10
21V 26 8530 CDCT S40102	eShop	eShop	eShop	eShop	10
21V 26 8540 CDCT S40104	eShop	eShop	—	eShop	10
●	P	M	N	Ti	
○	K	—	—	—	
⚙	SF	VS	AF	TIS	
Chip breaker					
a _p mm	0.05 – 0.23	0.05 – 0.23	0.05 – 0.75	0.05 – 0.23	
f mm/rev.	0.03 – 0.25	0.05 – 0.23	0.03 – 0.25	0.05 – 0.23	
v _c main application m/min	60 – 150	60 – 140	50 – 300	40 – 90	
v _c secondary application m/min	60 – 150	—	—	—	



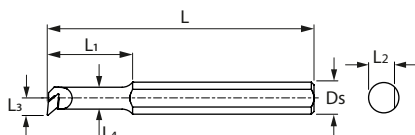
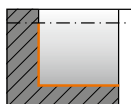
Garant E... SGL. 95° boring bars for indexable inserts GPCT S5010. / GCCT 06020.



Overhang / insert size	21V 26 8732	21V 26 8736	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
	Boring bar carbide									
mm	right-hand	left-hand	mm			mm	mm	mm	mm	
75/S5	eShop	eShop	6	E06J SGLPR/LS5	GPCT S5010.	9.15	5.6	5.54	110	269028 6
85/S5	eShop	eShop	8	E08K SGLPR/LS5	GPCT S5010.	10.72	6.4	7.49	125	269028 6
85/O6	eShop	eShop	10	E10K SGLCR/L06	GCCT 06020.	13.54	8.15	9.5	125	269028 11
100/O6	eShop	eShop	12	E12M SGLCR/L06	GCCT 06020.	15.52	9.15	11.33	150	269028 11



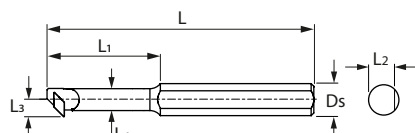
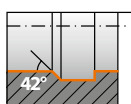
Garant AH... SGLP 95° boring bars for indexable inserts GPCT S5010.



Overhang / insert size	21V 26 8722	21V 26 8726	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
	Boring bar HSS											
mm	right-hand	left-hand	mm			mm	mm	mm	mm	mm	mm	
65/S5	eShop	eShop	12	AH0712H SGLPR/LS5	GPCT S5010.	9.15	5.6	11.15	7	25	100	269028 6
66/S5	eShop	eShop	12	AH0812H SGLPR/LS5	GPCT S5010.	10.72	6.4	11.15	8	32	100	269028 6



Garant AH... SGSP 45° boring bars for indexable inserts GPCT S5010.



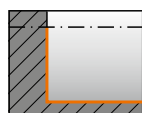
Overhang / insert size	21V 26 8802	21V 26 8806	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L ₄	L ₁	L	Set of insert screws
	Boring bar HSS											
mm	right-hand	left-hand	mm			mm	mm	mm	mm	mm	mm	
65/S5	eShop	eShop	12	AH0812H SGSPR/LS5	GPCT S5010.	10.72	6.4	11.15	8	32	100	269028 6

Garant Indexable inserts GPCT S5010. / GCCT 06020.

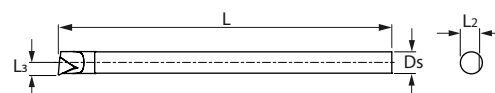


Grade	HB7035	HB7125-1	HU7310	HB7410	
21I 26 8560	GPCT S50102	eShop	eShop	eShop	10
21I 26 8570	GPCT S50104	eShop	eShop	eShop	10
21I 26 8590	GCCT 060202	eShop	eShop	eShop	10
21I 26 8600	GCCT 060204	eShop	eShop	eShop	10
●	P	M	N	Ti	
○	K	—	—	—	
⚙	●	●	●	●	
Chip breaker	SF	VS	AF	TIS	
a _p	mm	0.05 – 0.35	0.05 – 0.35	0.05 – 1.6	0.05 – 0.35
f	mm/rev.	0.03 – 0.25	0.05 – 0.23	0.03 – 0.25	0.05 – 0.23
v _c main application	m/min	60 – 150	60 – 140	50 – 300	40 – 90
v _c secondary application	m/min	60 – 150	—	—	—

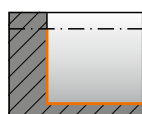



Garant E... STLD 95° boring bars for indexable inserts TDAT 07010.


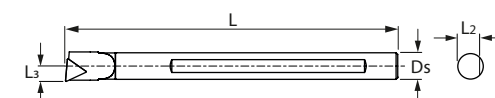
268822



Overhang / insert size	2TV 26 8822	2TV 26 8826	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
	Boring bar carbide									
mm	right-hand	left-hand	mm			mm	mm	mm	mm	
75/07	eShop	eShop	6	E06J STLDLDR/L07	TDAT 07010.	7.06	3.71	5.54	110	269028 12
85/07	eShop	eShop	8	E08K STLDLDR/L07	TDAT 07010.	9.14	4.8	7.49	125	269028 12


Garant AH... STLD 95° boring bars for indexable inserts TDAT 07010.


268812



Overhang / insert size	2TV 26 8812	2TV 26 8816	Ø D _s	ISO code toolholder	suitable indexable insert	Ø D _{min}	L ₃	L ₂	L	Set of insert screws
	Boring bar HSS									
mm	right-hand	left-hand	mm			mm	mm	mm	mm	
50/07	eShop	eShop	6	AH06X STLDLDR/L07	TDAT 07010.	7.06	3.71	5.54	75	269028 12
66/07	eShop	eShop	8	AH08H STLDLDR/L07	TDAT 07010.	9.14	4.8	7.49	100	269028 12

Garant Indexable inserts TDAT 07010.


Grade		HB7035	HB7125-1	HB7410	
2TV 26 8620	TDAT 070101	eShop	eShop	eShop	10
2TV 26 8630	TDAT 070102	eShop	eShop	eShop	10
2TV 26 8640	TDAT 070104	eShop	eShop	eShop	10
●		P	M	Ti	
○		K	—	—	
⚙		●	●	●	
Chip breaker		SF	VS	TIS	
a _p	mm	0.05 – 0.23			
f	mm/rev.	0.03 – 0.25			
v _c main application	m/min	60 – 150			
v _c secondary application	m/min	60 – 150			



GARANT "5 in 1" drilling and turning tools

26 8463/8464 – Plain shank.

26 8467/8468 – Plain shank **with collar**.

Application: Face turning, longitudinal turning, drilling, internal longitudinal turning, countersinking.

Note:

- Choose corner radii as large as possible.
- **Always use internal cooling for drilling (at least 5 bar).**

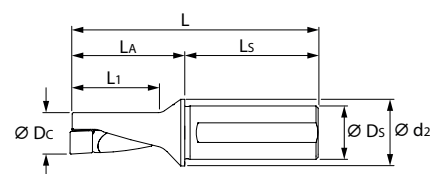
26 8467/8468 – Use the drilling and turning tool **in long chipping structural steels and long chipping stainless steels only up to 1.5×D.**



26 8463



26 8468



Ø D _c	21K 26 8463	21K 26 8464	21K 26 8467	21K 26 8468	Tolerance of bore Ø D	L _A	L _S	L ₁		Ø D _s		Ø d ₂	L	Indexable insert No. 268472 – 268496	Set of insert screws
	"5 in 1" drilling and turning tool														
	1.5×D	1.5×D	2.25×D	2.25×D		26 8467 26 8468	26 8467 26 8468	26 8463 26 8464	26 8467 26 8468	26 8463 26 8464	26 8467 26 8468	26 8467 26 8468	26 8463 26 8464		
mm	right-hand	left-hand	right-hand	left-hand	mm	mm	mm	mm	mm	mm	mm	mm	mm		
8	eShop	eShop	eShop	eShop	0/+0.22	22.5	38	12	18	12	10	12	80	WCHX 0401..	269028 30
10	eShop	eShop	eShop	eShop	0/+0.22	28	42	15	22.5	12	12	16	90	WCHX 05T1..	269028 31
11	eShop	eShop	eShop	eShop	0/+0.27	32	45	16.5	24.75	16	16	20	100	WCHX 0602..	269028 32
15	eShop	eShop	eShop	eShop	0/+0.27	43	50	22.5	33.75	20	20	25	125	WCHX 0703..	269028 33
18	eShop	eShop	eShop	eShop	0/+0.33	53	56	27	40.5	25	25	32	135	WCHX 0903..	269028 34
20	eShop	eShop	eShop	eShop	0/+0.33	56	56	30	45	25	25	32	150	WCHX 10T3..	269028 35
26	eShop	eShop	eShop	eShop	0/+0.33	73	60	39	58.5	32	32	40	180	WCHX 1305..	269028 36

GARANT indexable inserts WCHX.. for "5 in 1" drilling and turning tools



Type		SM	ALU	UNI		suitable for tool dia. D _c mm
21K 26 8472	WCHX 040102	eShop	eShop	eShop	1	8
21K 26 8474	WCHX 040104	eShop	eShop	eShop	1	8
21K 26 8476	WCHX 05T102	eShop	eShop	eShop	1	10
21K 26 8478	WCHX 05T104	eShop	eShop	eShop	1	10
21K 26 8480	WCHX 060202	eShop	eShop	eShop	1	11
21K 26 8482	WCHX 060204	eShop	eShop	eShop	1	11
21K 26 8484	WCHX 070304	eShop	eShop	eShop	1	15
21K 26 8486	WCHX 070308	eShop	eShop	eShop	1	15
21K 26 8488	WCHX 090304	eShop	eShop	eShop	1	18
21K 26 8490	WCHX 090308	eShop	eShop	eShop	1	18
21K 26 8492	WCHX 10T304	eShop	eShop	eShop	1	20
21K 26 8494	WCHX 10T308	eShop	eShop	eShop	1	20
21K 26 8496	WCHX 130508	eShop	eShop	eShop	1	26
●		P	N	UNI		
○		M	K	–		
Type		HB7120	HU70AL	HB7130		
v _c main application	m/min	110 – 220	300 – 600	65 – 200		
v _c secondary application	m/min	110 – 140	180	–		

Garant**"4 IN 1" DRILLING AND TURNING TOOL**

This multi-functional drilling and turning tool allows one-off and series components to be produced inexpensively and efficiently. Tool-changing and set-up times are minimised and the cost-benefit ratio is maximised.

1. Longitudinal turning



2. Drilling into solid material



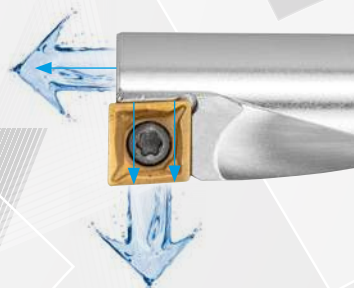
3. Internal longitudinal turning



4. Facing

**Ideal cooling.**

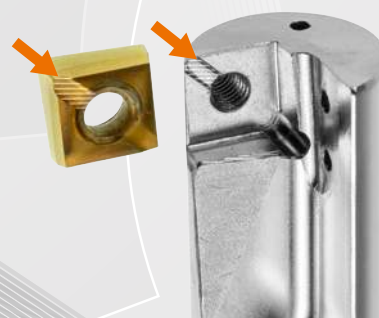
Optimised cooling using three target-directed coolant channels. The positioning of these channels permits better chip evacuation from holes.

**Optimum stability.**

- Specially hardened shank for outstanding stability.
- Strength and dynamics are equally matched.
- Sturdy design of the carrier due to relatively small indexable insert.
- Improved resistance to the radial and axial forces that occur.

Reliable changing of the indexable insert.

The positive-locking design of the insert seat makes it impossible to incorrectly fit the indexable insert.



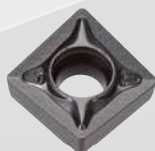
The GARANT "4 in 1" drilling and turning tool improves your machine efficiency by up to 30% by eliminating tool-changing time and machine idle time.

Variety of tool materials for optimum machining results.

Especially in sub-contract manufacturing, it is not unusual to experience a constant change of the material to be machined. The many demands on tool life, surface and tolerance can be satisfied by selecting the right tool material.



HBZ025



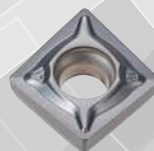
HBZ030



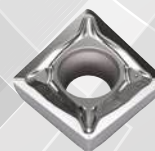
HBZ035



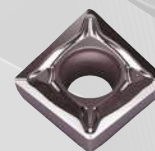
HBZ120



HBZ140



HUZ310



HBZ310



GARANT GARANT "4 in 1" drilling and turning tools

26 8404/8405 – Plain shank.

26 8408/8409 – Plain shank **with collar**.

Application:

1. Facing of end faces.
2. Drilling (drilling out and drilling from solid) – flat drilled hole end.
3. Internal longitudinal turning.
4. External longitudinal turning.

Note:

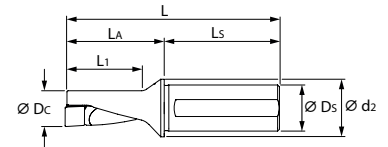
- Choose corner radii and toolholder size as large as possible.
- **Drilling tolerance + 0.15 mm** (for drilling processes with a driven tool).
- When drilling greater than nominal $\varnothing$, residual material will remain.
- **Always use internal cooling for drilling (at least 5 bar).**



26 8404



26 8408

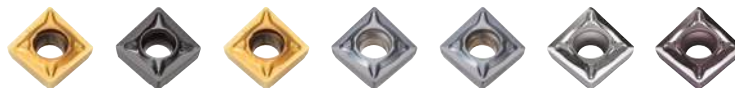


Ø D _c	26 8404	26 8405	26 8408	26 8409	L _A	L _s	L ₁		Ø D _s	Ø d ₂	L	suitable indexable insert	Set of insert screws
	"4 in 1" drilling and turning tool												
	1.5×D	1.5×D	2.25×D	2.25×D	26 8408 26 8409	26 8408 26 8409	26 8404 26 8405	26 8408 26 8409		26 8408 26 8409	26 8404 26 8405		
mm	right-hand	left-hand	right-hand	left-hand	mm	mm	mm	mm	mm	mm	mm		
10	eShop	eShop	eShop	eShop	29	42	15	22.5	12	16	90	ZCMX 05..	269028 40 (IP6; 0.6 Nm)
12	eShop	eShop	eShop	eShop	35	45	18	27	16	20	100	ZCMX 06..	269028 41 (IP7; 0.9 Nm)
14	eShop	eShop	eShop	eShop	38.5	45	21	31.5	16	20	110	ZCMX 07..	269028 48 (IP7; 0.9 Nm)
16	eShop	eShop	eShop	eShop	43	50	24	36	20	25	125	ZCMX 08..	269028 42 (IP9; 1.4 Nm)
18	eShop	eShop	eShop	eShop	53	56	27	40.5	25	32	135	ZCMX 09..	269028 44 (IP10; 2 Nm)
20	eShop	eShop	eShop	eShop	57.5	56	30	46	25	32	150	ZCMX 10..	269028 43 (IP10; 2 Nm)
25	eShop	eShop	eShop	eShop	73	60	37.5	56	32	40	180	ZCMX 13..	269028 45 (IP20; 5 Nm)

GARANT GARANT inserts ZCMX.. for "4 in 1" drilling and turning tools

Size HBZ030 – Harder substrate for longer tool life with thinner CVD coating. Especially for facing and longitudinal turning applications.

Size HBZ025; HBZ035; HBZ140 – General-purpose medium grit substrate with PVD coating. First choice for turning and drilling applications.



Grade		HBZ025	HBZ030	HBZ035	HBZ120	HBZ140	HUZ310	HBZ310		suitable for tool dia. D_c mm
26 8419	ZCMX 050202	–	–	–	–	–	eShop	eShop	10	10
26 8420	ZCMX 050204	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	10
26 8421	ZCMX 060202	–	–	–	–	–	eShop	eShop	10	12
26 8423	ZCMX 060204	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	12
26 8428	ZCMX 070302	–	–	–	–	–	eShop	eShop	10	14
26 8439	ZCMX 070304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	14
26 8424	ZCMX 080302	–	–	–	–	–	eShop	eShop	10	16
26 8425	ZCMX 080304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	16
26 8427	ZCMX 080308	eShop	eShop	eShop	eShop	eShop	–	–	10	16
26 8437	ZCMX 09T302	–	–	–	–	–	eShop	eShop	10	18
26 8438	ZCMX 09T304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	18
26 8429	ZCMX 10T302	–	–	–	–	–	eShop	eShop	10	20
26 8433	ZCMX 10T304	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	20
26 8434	ZCMX 10T308	eShop	eShop	eShop	eShop	eShop	–	–	10	20
26 8442	ZCMX 130402	–	–	–	–	–	eShop	eShop	10	25
26 8443	ZCMX 130404	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	25
26 8444	ZCMX 130408	eShop	eShop	eShop	eShop	eShop	–	–	10	25
●		P	P	P	M	M	N	N		
⚙		●	●	●	●	●	●	●		
a_p	mm	0.4 – 2	0.4 – 2	0.4 – 2	0.4 – 2	0.4 – 2	0.2 – 4	0.2 – 4		
f when turning	mm	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3	0.05 – 0.4	0.05 – 0.4		
f when drilling	mm	0.03 – 0.12	0.03 – 0.12	0.03 – 0.12	0.03 – 0.12	0.03 – 0.12	0.03 – 0.3	0.03 – 0.3		
v_c main application	m/min	90 – 210	70 – 200	50 – 190	90 – 200	50 – 190	200 – 600	200 – 600		



26

WE'RE BIG ON THE LITTLE THINGS TOO!

Our comprehensive range includes suitable turning solutions starting from a hole diameter of just 0.3 mm.

SIMTEK

With the simturn range, the Hoffmann Group offers a comprehensive turning range for micro-machining. On the following pages you will find a large selection ex stock from the Hoffmann Group.

All 16,000 standard tools under the Simtek brand can be ordered from the Hoffmann eShop. Individual custom solutions are available on request.

simturn^{AX}

SIMTEK small part machining type AX

- From hole diameter 0.3 mm.
- CBN tools from a hole diameter of 1 mm.
- Overhang lengths up to 9×D.
- Standard range ex stock, Hoffman Group.
- Special solutions on request.

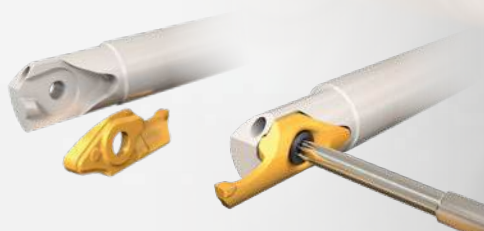
Member IMC Group
iscnf

MIN CUT

MINI FACE LINE

MINCUT – the flexible system for axial and internal machining of small and medium-sized components.

- Can be used from 8 mm bore diameter.
- Groove widths from 1.5 – 3.5 mm.
- Groove depths of up to 15 mm possible.
- Optimum chip evacuation thanks to soft-cutting geometry and targeted coolant supply into the cutting zone.
- Stable and accurately repeatable screw clamping thanks to defined contact surfaces between the tool and the cutter insert.





Designation	Micro-machining				
	Boring-out	Copying	Radial grooving	Axial grooving	Thread turning
Application					
Brand	Garant	Garant	Garant	Garant	Garant
Version / standards	without / with chip breaker		Groove / full radius / DIN 472	Groove / full radius external / internal	metric 60° internal right-hand full profile
Ø D _{min} / Pitch mm	7.8 – 11	7.8 – 11	8 – 11	6 – 14	0.5 – 2
Tool material	HB720	HB720	HB720	HB720	HB720
Page(s)	830	830	831	890	831



Designation	Micro-machining			
	Radial grooving	Internal undercutting	Axial grooving and internal grooving	Axial grooving and external grooving on the pin
Application				
Brand	ISENF	ISENF	ISENF	ISENF
Version	neutral	Full radius	neutral / full radius	neutral / full radius
Ø D _{min} mm	8.5 – 9.2	8 – 8.3	8 – 999	7 – 100
Tool material	IC908	IC908	IC908	IC908
Page(s)	839	840	840	840

CBN version ex-stock from the Hoffmann Group.



Designation	Micro-machining									
	Boring-out		Copying		Radial grooving		Axial grooving		Thread turning	
Application										
Brand	Garant	SIMIEK	Garant	SIMIEK	Garant	SIMIEK	Garant	SIMIEK	Garant	SIMIEK
Version / standards		Standard / Center Line			Groove / full radius		external / internal		metric 60° internal right-hand	
									Full profile	Partial profile
Ø D _{min} / Pitch mm	1 – 6.2	1 – 6.2	4.2 – 6.2	2.7 – 8	4.2 – 6.2	2 – 7.2	6.2 – 14	6.2	0.5 – 1.5	0.5 – 1.75
Tool material / coating	Carbide / TiCN	Carbide; CBN / X800	Carbide / TiCN	Carbide / X800	Carbide / TiCN	Carbide / X800	Carbide / TiCN	Carbide / X800	Carbide / TiCN	Carbide / X800
Page(s)	832	834 – 838	832	836 / 838	833	836 – 837	833 / 889	837	833	837 / 838



Garant Mini boring bar for indexable inserts

- Carbide insert screwed on to the end face, positive force transmission due to end face serrations.
- Insert change is very easy to perform.

27 0006 – Low-vibration carbide shank with soldered steel head and hardened insert seat.

Note:

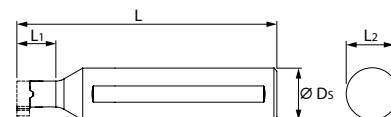
27 0006 Size 42/6; 50/6; 64/8 – **Only** for boring and chamfering!



27 0002



27 0006

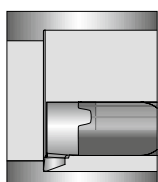


Overhang L_1 / insert size d	21V 27 0002	21V 27 0006	$\varnothing D_s$	L_2	L	Insert screw
	Mini boring bar, steel	Mini boring bar, carbide				
mm	right-hand	right-hand	mm	mm	mm	
12/6	eShop	–	16	15.6	80	279815 10
21/6	–	eShop	12	11.5	80.5	279815 10
30/6	–	eShop	12	11.5	90.5	279815 10
42/6	–	eShop	12	11.5	100.5	279815 10
50/6	–	eShop	12	11.5	115	279815 10
12/8	eShop	–	16	15.6	80	279815 11
29/8	–	eShop	12	11.5	95	279815 11
42/8	–	eShop	12	11.5	110	279815 11
56/8	–	eShop	12	11.5	120	279815 11
64/8	–	eShop	12	11.5	130	279815 11

Garant Mini inserts

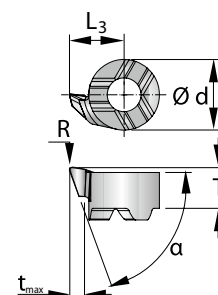
Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	Alu < 500 N	Alu < 750 N	Alu < 900 N	Alu < 1100 N	Alu < 1400 N	Alu < 55 HRC	Alu < 60 HRC	Alu < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
27 0020–27 0140	80	80	60	80	80	80	80	60				70	50	30	60	80			●	○	○	●	●

For boring out

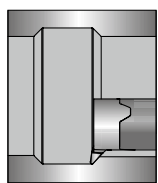


27 0020 27 0021

$\varnothing D_{min}$	21V 27 0020	21V 27 0021		$\varnothing d$	T	L_3	t_{max}	R	α	f	maximum cutting depth a_{pmax}
	Mini insert for internal boring out without chip breaker	Mini insert for internal boring out with chip breaker									
mm	right-hand HB720	right-hand HB720		mm	mm	mm	mm	mm	degrees	mm/rev.	mm
7,8	eShop	eShop	10	6	3.65	4.65	1.3	0.2	70	0.02 – 0.03	0.15 – 0.5
11	eShop	eShop	10	8	4	6.7	2.3	0.2	70	0.02 – 0.03	0.15 – 0.5

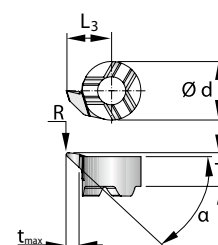


For copying

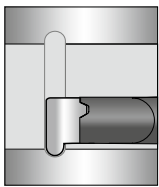


27 0040

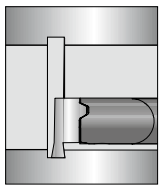
$\varnothing D_{min}$	21V 27 0040		$\varnothing d$	T	L_3	t_{max}	R	α	f	maximum cutting depth a_{pmax}
	Mini insert for internal copying									
mm	right-hand HB720		mm	mm	mm	mm	mm	degrees	mm/rev.	mm
7,8	eShop	10	6	3.65	4.65	1.2	0.2	43	0.02 – 0.03	0.15 – 0.5
11	eShop	10	8	4.1	6.7	2.3	0.2	43	0.02 – 0.03	0.15 – 0.5



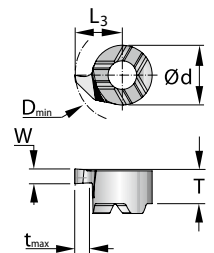
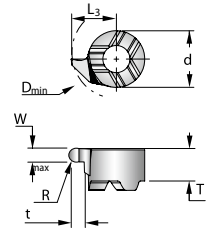
For internal grooving



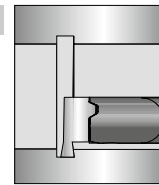
$\emptyset D_{\min} / w$	211	27 0050 Mini insert for internal grooving, full radius right-hand HB720		$\emptyset d$	w	T	L_3	R	$t_{\max}$	f
mm				mm	mm	mm	mm	mm	mm	mm/rev.
8/0,8		eShop	10	6	0.8	3.6	4.8	0.4	1	0.02 – 0.03
8/1,2		eShop	10	6	1.2	3.6	4.8	0.6	1	0.02 – 0.03
8/2,0		eShop	10	6	2	3.6	4.8	1	1	0.02 – 0.03
11/0,8		eShop	10	8	0.8	4	6.7	0.4	2.3	0.02 – 0.03
11/1,2		eShop	10	8	1.2	4	6.7	0.6	2.3	0.02 – 0.03
11/2,0		eShop	10	8	2	4	6.7	1	2.3	0.02 – 0.03



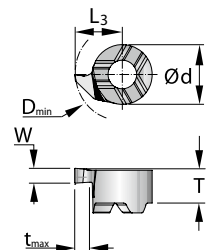
$\emptyset D_{\min} / w$	211	27 0090 Mini insert for internal grooving right-hand HB720		$\emptyset d$	T	L_3	$t_{\max}$	f
mm				mm	mm	mm	mm	mm/rev.
8/1,0		eShop	10	6	3.6	4.8	1	0.02 – 0.03
8/1,5		eShop	10	6	3.6	4.8	1	0.02 – 0.03
8/2,0		eShop	10	6	3.6	4.8	1	0.02 – 0.03
11/1,0		eShop	10	8	4	6.7	2.3	0.02 – 0.03
11/1,5		eShop	10	8	4	6.7	2.3	0.02 – 0.03
11/2,0		eShop	10	8	4	6.7	2.3	0.02 – 0.03
11/2,5		eShop	10	8	4	6.7	2.3	0.02 – 0.03



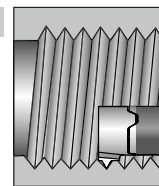
For grooving to DIN 472

DIN
472

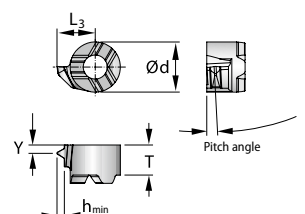
$\emptyset D_{\min} / \text{slot width m (H13)}$	211	27 0110 Mini insert for internal grooving, DIN 472 right-hand HB720		$\emptyset d$	w	T	L_3	$t_{\max}$	f
mm				mm	mm	mm	mm	mm	mm/rev.
8/0,9		eShop	10	6	0.93	3.6	4.8	1	0.02 – 0.03
8/1,1		eShop	10	6	1.2	3.6	4.8	1	0.02 – 0.03
8/1,3		eShop	10	6	1.4	3.6	4.8	1	0.02 – 0.03
8/1,6		eShop	10	6	1.7	3.6	4.8	1	0.02 – 0.03
11/0,9		eShop	10	8	0.93	4	6.7	1.5	0.02 – 0.03
11/1,1		eShop	10	8	1.2	4	6.7	2.2	0.02 – 0.03
11/1,3		eShop	10	8	1.4	4	6.7	2.2	0.02 – 0.03
11/1,6		eShop	10	8	1.7	4	6.7	2.2	0.02 – 0.03



For threading

DIN
13

Pitch	211	27 0140 Mini insert for internal threading right-hand HB720		$\emptyset d$	T	L_3	$h_{\min}$	Y	Pitch angle	Number of passes
mm				mm	mm	mm	mm	mm	degrees	
0,5		eShop	10	6	3.8	3.86	0.29	0.35	1	4 – 6
0,75		eShop	10	6	3.8	4.19	0.43	0.5	1.5	4 – 7
1		eShop	10	6	3.8	4.29	0.58	0.5	2	4 – 8
1,25		eShop	10	6	3.8	4.44	0.72	0.8	2.5	5 – 9
1,5		eShop	10	6	3.8	4.58	0.87	0.9	3	6 – 10
1,75		eShop	10	6	3.8	4.8	1.01	0.9	3	7 – 12
2		eShop	10	8	4.2	6.47	1.15	1.1	2.5	7 – 12

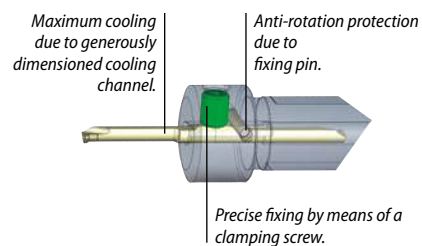
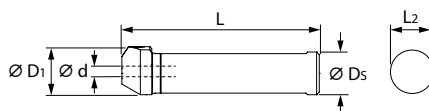


27



Garant Micro cutter holder

Spare part: Clamp screw No. 279815 3.

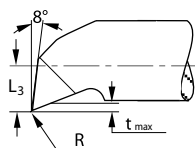
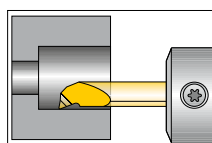


Ø D _s	2V 27 0200	2V 27 0202	2V 27 0204	Ø D ₁	L ₂	L
	Micro cutter holder					
mm	Ø d = 4 mm	Ø d = 5 mm	Ø d = 6 mm	mm	mm	mm
10	eShop	eShop	—	14	8.8	65
12	eShop	eShop	eShop	16	10.8	70
16	eShop	eShop	eShop	18.6	14.8	75
20	eShop	eShop	eShop	22	18.8	84

Garant Micro inserts for cutter holders No. 270200 – 270204

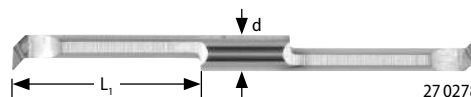
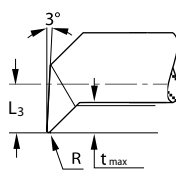
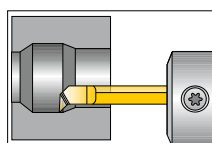
For the feed rates, see the eShop

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	Y < 500 N	Y < 750 N	Y < 900 N	Y < 1100 N	Y < 1400 N	Y < 55 HRC	Y < 60 HRC	Y < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	Gg(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
27 0210–27 0365	250	200	200	160	150	150	80	60	30			90	60	30	90	150							
27 0400	200	200	150	160	150	150	80	60	30			90	60	30	90	150							

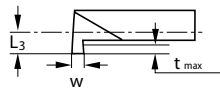
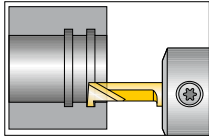


Ø D _{min}	2V 27 0210	2V 27 0212	2V 27 0214	2V 27 0216	2V 27 0218	2V 27 0220	2V 27 0222	2V 27 0224	Ø d	L ₃	t _{max}	R
	Micro boring-out insert, internal, right-hand											
mm	L ₁ = 6 mm	L ₁ = 10 mm	L ₁ = 16 mm	L ₁ = 21 mm	L ₁ = 26 mm	L ₁ = 30 mm	L ₁ = 35 mm	L ₁ = 40 mm	mm	mm	mm	mm
1	eShop	—	—	—	—	—	—	—	4	0.49	0.15	0.1
1,5	—	eShop	—	—	—	—	—	—	4	0.69	0.15	0.1
2,2	—	eShop	eShop	—	—	—	—	—	4	0.95	0.15	0.1
3,2	—	eShop	eShop	eShop	—	—	—	—	4	1.45	0.15	0.15
4,2	—	eShop	eShop	eShop	eShop	—	—	—	4	1.95	0.3	0.15
5,2	—	eShop	eShop	eShop	eShop	eShop	eShop	—	5	2.45	0.5	0.2
6,2	—	—	eShop	eShop	eShop	eShop	eShop	eShop	6	2.95	0.5	0.2

Ø D _{min}	2V 27 0240	2V 27 0242	2V 27 0244	2V 27 0246	2V 27 0248	2V 27 0250	2V 27 0252	2V 27 0254	Ø d	L ₃	t _{max}	R
	Micro boring-out insert, internal, left-hand											
mm	L ₁ = 6 mm	L ₁ = 10 mm	L ₁ = 16 mm	L ₁ = 21 mm	L ₁ = 26 mm	L ₁ = 30 mm	L ₁ = 35 mm	L ₁ = 40 mm	mm	mm	mm	mm
1	eShop	—	—	—	—	—	—	—	4	0.49	0.15	0.1
1,5	—	eShop	—	—	—	—	—	—	4	0.69	0.15	0.1
2,2	—	eShop	eShop	—	—	—	—	—	4	0.95	0.15	0.1
3,2	—	eShop	eShop	eShop	—	—	—	—	4	1.45	0.15	0.15
4,2	—	eShop	eShop	eShop	eShop	—	—	—	4	1.95	0.3	0.15
5,2	—	eShop	eShop	eShop	eShop	eShop	eShop	—	5	2.45	0.5	0.2
6,2	—	—	eShop	eShop	eShop	eShop	eShop	eShop	6	2.95	0.5	0.2

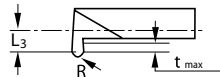
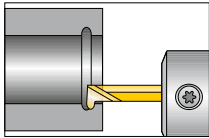


Ø D _{min}	2V 27 0270	2V 27 0272	2V 27 0274	2V 27 0278	2V 27 0290	2V 27 0292	2V 27 0294	2V 27 0298	Ø d	L ₃	t _{max}	R
	Micro copying insert, internal, right-hand				Micro copying insert, internal, left-hand							
mm	L ₁ = 10 mm	L ₁ = 16 mm	L ₁ = 21 mm	L ₁ = 30 mm	L ₁ = 10 mm	L ₁ = 16 mm	L ₁ = 21 mm	L ₁ = 30 mm	mm	mm	mm	mm
4,2	eShop	eShop	eShop	—	eShop	eShop	eShop	—	4	1.95	0.75	0.15
5,2	—	eShop	eShop	—	—	eShop	eShop	—	5	2.45	0.95	0.2
6,2	—	eShop	eShop	eShop	—	eShop	eShop	eShop	6	2.95	1.75	0.2



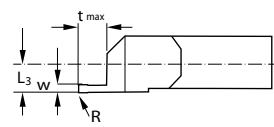
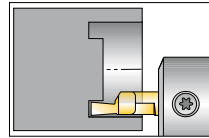
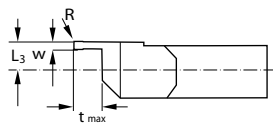
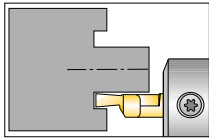
27 0324

$\emptyset D_{\min} / w$	211 27 0310	211 27 0312	211 27 0314	211 27 0320	211 27 0322	211 27 0324	$\emptyset d$	L_3	$t_{\max}$
	Micro grooving insert, internal, right-hand			Micro grooving insert, internal, left-hand					
mm	$L_1 = 10 \text{ mm}$	$L_1 = 15 \text{ mm}$	$L_1 = 20 \text{ mm}$	$L_1 = 10 \text{ mm}$	$L_1 = 15 \text{ mm}$	$L_1 = 20 \text{ mm}$	mm	mm	mm
4,2/1	eShop	eShop	eShop	eShop	eShop	eShop	4	2	0.8
5,2/1	eShop	eShop	eShop	eShop	eShop	eShop	5	2.5	1
5,2/1,5	eShop	eShop	eShop	eShop	eShop	eShop	5	2.5	1
5,2/2	eShop	eShop	eShop	eShop	eShop	eShop	5	2.5	1
6,2/1	eShop	eShop	eShop	eShop	eShop	eShop	6	3	1.8
6,2/1,5	eShop	eShop	eShop	eShop	eShop	eShop	6	3	1.8
6,2/2	eShop	eShop	eShop	eShop	eShop	eShop	6	3	1.8



27 0334

$\emptyset D_{\min} / w$	211 27 0330	211 27 0332	211 27 0334	211 27 0340	211 27 0342	211 27 0344	$\emptyset d$	L_3	$t_{\max}$	R
	Micro grooving insert, full radius, internal, right-hand			Micro grooving insert, full radius, internal, left-hand						
mm	$L_1 = 15 \text{ mm}$	$L_1 = 20 \text{ mm}$	$L_1 = 25 \text{ mm}$	$L_1 = 15 \text{ mm}$	$L_1 = 20 \text{ mm}$	$L_1 = 25 \text{ mm}$	mm	mm	mm	mm
4,2/1	eShop	—	—	eShop	—	—	4	1.95	0.8	0.5
5,2/1	—	eShop	—	—	eShop	—	5	2.45	1	0.5
5,2/2	—	eShop	—	—	eShop	—	5	2.45	1	1
6,2/1	—	—	eShop	—	—	eShop	6	2.95	1.8	0.5
6,2/2	—	—	eShop	—	—	eShop	6	2.95	1.8	1

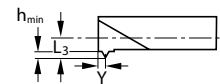
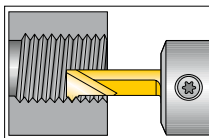
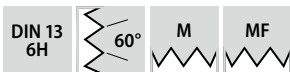


27 0350



27 0360

$\emptyset D_{\min} / W$	211 27 0350	211 27 0355	211 27 0360	211 27 0365	$\emptyset d$	L_3	$t_{\max}$	R
	Micro axial grooving insert, external, right-hand	Micro axial grooving insert, external, left-hand	Micro axial grooving insert, internal, right-hand	Micro axial grooving insert, internal, left-hand				
mm	$L_1 = 15 \text{ mm}$	$L_1 = 15 \text{ mm}$	$L_1 = 15 \text{ mm}$	$L_1 = 15 \text{ mm}$	mm	mm	mm	mm
6,2/1	eShop	eShop	eShop	eShop	6	2.95	2	0.1
6,2/1,5	eShop	eShop	eShop	eShop	6	2.95	3	0.1
6,2/2	eShop	eShop	eShop	eShop	6	2.95	4	0.1
6,2/2,5	eShop	eShop	eShop	eShop	6	2.95	5	0.1
6,2/3	eShop	eShop	eShop	eShop	6	2.95	6	0.1



27 0400_3,4/0,5



27 0400_5,8/1

$\emptyset D_{\min} / \text{Pitch}$	211 27 0400	$\emptyset d$	L_3	Y	$h_{\min}$
	Micro thread turning insert, internal, full profile 60°, right-hand				
mm	$L_1 = 16 \text{ mm}$	mm	mm	mm	mm
3,4/0,5	eShop	4	0.9	0.4	0.29
4,4/0,5	eShop	4	1.9	0.4	0.29
4,9/0,5	eShop	5	1.7	0.4	0.29
5,4/0,5	eShop	6	1.9	0.4	0.29
3,2/0,7	eShop	4	0.9	0.5	0.41
4,6/0,75	eShop	5	1.7	0.6	0.43
5,6/0,75	eShop	6	1.9	0.6	0.43
4/0,8	eShop	4	0.9	0.6	0.46
4,8/1	eShop	4	1.9	0.7	0.58
5,8/1	eShop	5	2.4	0.7	0.58
6,3/1	eShop	6	2.9	0.7	0.58
6,5/1,25	eShop	6	2.9	0.9	0.72
8,3/1,5	eShop	6	2.9	1	0.87

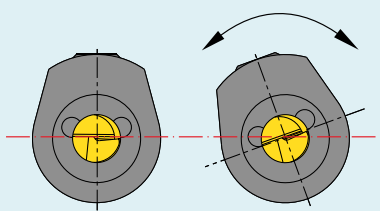


27

SIMTEK simturn AX Center Line

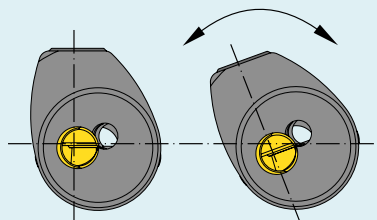


Standard version



Suitable for all cutter inserts.

Center Line version

For use only with optimised cutter inserts
(for $\varnothing$ range < 4.2 mm).

- The eccentric mounting of the Centre Line version ensures extremely precise cutting edge positioning, even in the event of slight variations in the tool mounting.
- The cutting results are significantly optimised, especially for very small diameters.
- Ideal coolant feed directly to the bore to be machined.



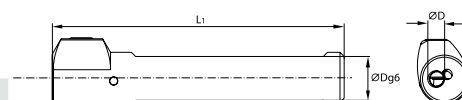
SIMTEK simturn AX Center Line toolholder

Eccentric mounting of cutter inserts.

Advantage: Eccentric mounting ensures precise cutting edge positioning at all times.**Application:** In particular for very small boring-out diameters.

27 0500

$\varnothing$ Dg6	24U	27 0500	24U	27 0501	L ₁	Clamping screw
		simturn AX Center Line toolholder, right-hand		simturn AX Center Line toolholder, left-hand		
mm		$\varnothing D = 4$ mm			mm	
10		eShop		eShop	65	279710 1
12		eShop		eShop	70	279710 1
16		eShop		eShop	75	279710 1
20		eShop		eShop	90	279710 1

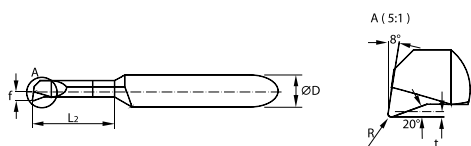
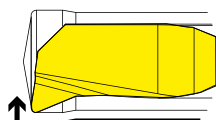


SIMTEK simturn AX Center Line cutter inserts

Suitable for/ v _c [m/min]	Alu plastics ø22	Alu cast ⚙️ > 10 % Si	Alu cast > 10 % Si < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
27 0503–27 0517		400	240	180	130						100	70	40	110	210							
27 0521–27 0527										90												

simturn AX Center Line cutter inserts for boring out

Coating: X800 (successor to coating GN39)

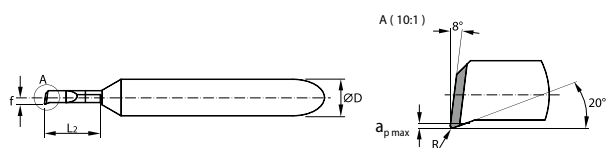
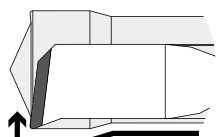


27 0509

$\varnothing$ D _{min}	24U	27 0503	24U	27 0505	24U	27 0507	24U	27 0509	24U	27 0511	24U	27 0513	24U	27 0515	24U	27 0517	$\varnothing$ D	R	f	t _{max}
		simturn AX Center Line, boring-out insert, right-hand				simturn AX Center Line boring-out insert, left-hand														
mm		L ₂ = 6.1 mm	L ₂ = 10.2 mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm	L ₂ = 6.1 mm	L ₂ = 10.2 mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm								mm	mm	mm	mm
1		eShop	—	—	—	eShop	—	—	—								4	0.1	1.95	0.1
1,4		eShop	eShop	—	—	eShop	eShop	—	—								4	0.1	1.95	0.15
2,7		—	eShop	eShop	eShop	—	eShop	eShop	—								4	0.15	1.95	0.2
3,2		—	eShop	eShop	eShop	—	eShop	eShop	—								4	0.15	1.95	0.2
3,7		—	eShop	eShop	eShop	—	eShop	eShop	—								4	0.15	1.95	0.2

simturn AX Center Line cutter inserts for boring out – CBN

Tool material = CBN8



27 0527

$\varnothing$ D _{min}	24U	27 0521	24U	27 0523	24U	27 0525	24U	27 0527	$\varnothing$ D	R	f	a _{p max}
		simturn AX Center Line boring-out insert, right-hand CBN										
mm		L ₂ = 6.1 mm	L ₂ = 10.2 mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm				mm	mm	mm	mm
1		eShop	—	—	—				4	0.1	1.95	0.05
1,4		eShop	eShop	—	—				4	0.1	1.95	0.07
2,7		—	eShop	eShop	eShop				4	0.15	1.95	0.13
3,2		—	eShop	eShop	eShop				4	0.15	1.95	0.16
3,7		—	eShop	eShop	eShop				4	0.15	1.95	0.18



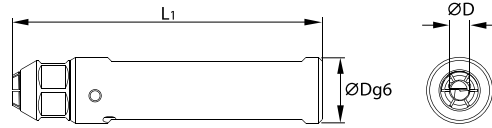
SIMTEK simturn AX toolholder

simturn AX toolholder with ME clamping system

Optionally select 4 different types of coolant feed. Easy to adjust using only two grub screws.

Advantage: The ME clamping system permits optimum precision and stability thanks to the all-round wrapping.

Application: Especially for long overhangs to reduce vibrations.

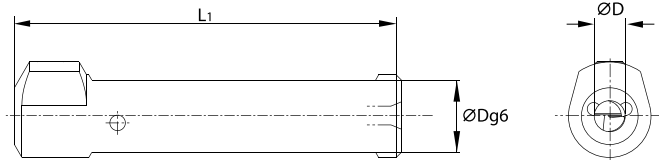


27 0529

Ø Dg6	24U	27 0529	24U	27 0531	24U	27 0533	24U	27 0535	24U	27 0536	L ₁	Union nut		
simturn AX toolholder ME clamping system												27 0529 27 0531	27 0533 27 0535	27 0536
mm		D = 4 mm	D = 5 mm	D = 6 mm	D = 7 mm	D = 8 mm					mm			
12		eShop	eShop	eShop	—	—					70	279715 1	279715 2	—
16		eShop	eShop	eShop	eShop	eShop					75	279715 1	279715 2	279715 3
20		eShop	eShop	eShop	eShop	eShop					90	279715 1	279715 2	279715 3
25		eShop	eShop	eShop	eShop	eShop					110	279715 1	279715 2	279715 3

simturn AX toolholder

Application: For all standard applications.



27 0537

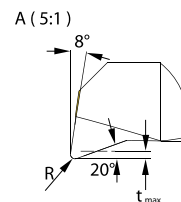
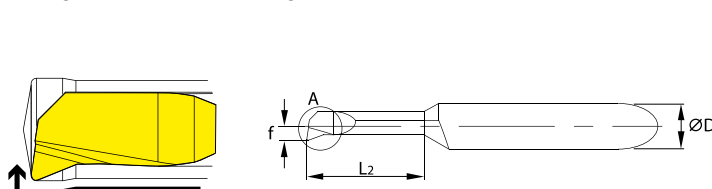
Ø Dg6	24U	27 0537	24U	27 0539	24U	27 0541	24U	27 0543	24U	27 0544	L ₁	Clamping screw	
simturn AX toolholder													
mm		D = 4 mm	D = 5 mm	D = 6 mm	D = 7 mm	D = 8 mm					mm		
10		eShop	eShop	—	—	—					65	279710 1	
12		eShop	eShop	eShop	—	—					70	279710 1	
16		eShop	eShop	eShop	eShop	eShop					75	279710 1	
20		eShop	eShop	eShop	eShop	eShop					90	279710 1	
25		eShop	eShop	eShop	eShop	eShop					110	279710 1	

SIMTEK simturn AX cutter inserts

Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni	○	◊	⊙	●	✱
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N					
27 0545–27 0575/ 0591–27 0649		400	240	180		130						100	70	40	110	210			●	○	●
27 0577–27 0589										90									●		●

simturn AX cutter inserts for boring out

Coating: X800 (successor to coating GN39)

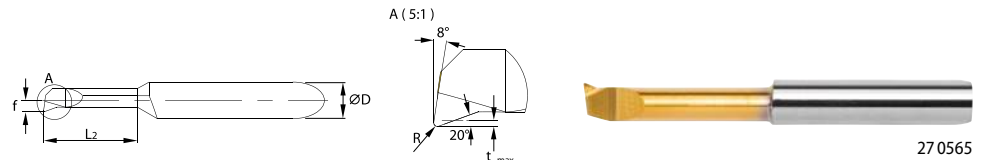


27 0549

Ø D _{min}	24U	27 0545	24U	27 0547	24U	27 0549	24U	27 0551	24U	27 0553	24U	27 0555	24U	27 0557	24U	27 0559	Ø D	R	f	t _{max}
simturn AX boring-out insert, right-hand																				
mm		L ₂ = 6.1 mm	L ₂ = 10.2 mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm	L ₂ = 25.4 mm	L ₂ = 30.5 mm	L ₂ = 35.6 mm	L ₂ = 40.6 mm								mm	mm	mm	mm
1		eShop	—	—	—	—	—	—	—								4	0.1	0.45	0.1
1,4		eShop	eShop	—	—	—	—	—	—								4	0.1	0.6	0.15
2,7		—	eShop	eShop	—	—	—	—	—								4	0.15	1.2	0.2
3,2		—	eShop	eShop	eShop	—	—	—	—								4	0.15	1.45	0.2
3,7		—	eShop	eShop	eShop	—	—	—	—								4	0.15	1.7	0.2
4,2		—	eShop	eShop	eShop	eShop	—	—	—								4	0.15	1.95	0.3
5,2		—	eShop	eShop	eShop	eShop	eShop	—	—								5	0.2	2.45	0.5
6,2		—	—	eShop	eShop	eShop	eShop	eShop	eShop								6	0.2	2.95	0.5



27

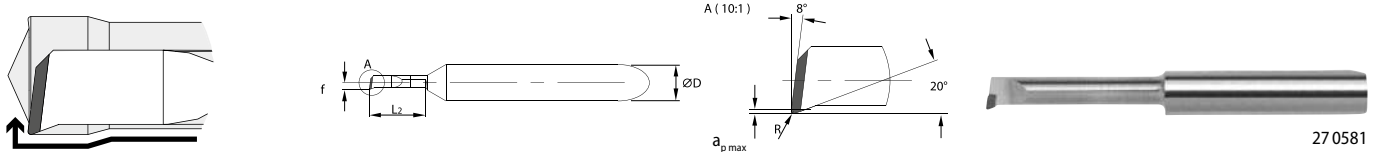


27 0565

Ø D _{min}	24V 27 0561	24V 27 0563	24V 27 0565	24V 27 0567	24V 27 0569	24V 27 0571	24V 27 0573	24V 27 0575	Ø D	R	f	t _{max}
	simturn AX boring-out insert, left-hand											
mm	L ₂ = 6.1 mm	L ₂ = 10.2 mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm	L ₂ = 25.4 mm	L ₂ = 30.5 mm	L ₂ = 35.6 mm	L ₂ = 40.6 mm	mm	mm	mm	mm
1	eShop	—	—	—	—	—	—	—	4	0.1	0.45	0.1
1,4	eShop	eShop	—	—	—	—	—	—	4	0.1	0.6	0.15
2,7	—	eShop	eShop	—	—	—	—	—	4	0.15	1.2	0.2
3,2	—	eShop	eShop	eShop	—	—	—	—	4	0.15	1.45	0.2
3,7	—	eShop	eShop	eShop	—	—	—	—	4	0.15	1.7	0.2
4,2	—	eShop	eShop	eShop	eShop	—	—	—	4	0.15	1.95	0.3
5,2	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	5	0.2	2.45	0.5
6,2	—	—	eShop	eShop	eShop	eShop	eShop	eShop	6	0.2	2.95	0.5

simturn AX cutter inserts for boring out – CBN

Tool material: CBN8

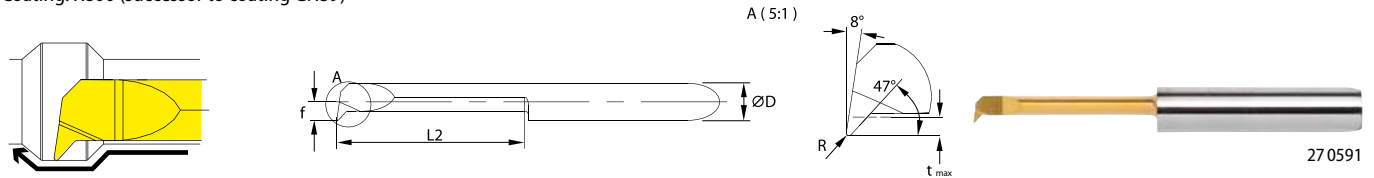


27 0581

Ø D _{min}	24V 27 0577	24V 27 0579	24V 27 0581	24V 27 0583	24V 27 0585	24V 27 0587	24V 27 0589	Ø D	R	f	a _{p max}
	simturn AX boring-out insert, right-hand CBN										
mm	L ₂ = 6.1 mm	L ₂ = 10.2 mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm	L ₂ = 25.4 mm	L ₂ = 30.5 mm	L ₂ = 35.6 mm	mm	mm	mm	mm
1	eShop	—	—	—	—	—	—	4	0.1	0.45	0.05
1,4	eShop	eShop	—	—	—	—	—	4	0.1	0.6	0.07
2,7	—	eShop	eShop	—	—	—	—	4	0.15	1.2	0.13
3,2	—	eShop	eShop	eShop	—	—	—	4	0.15	1.45	0.16
4,2	—	eShop	eShop	eShop	eShop	—	—	4	0.15	1.95	0.21
5,2	—	eShop	eShop	eShop	eShop	eShop	—	5	0.2	2.45	0.26
6,2	—	—	eShop	eShop	eShop	eShop	eShop	6	0.2	2.95	0.31

simturn AX cutter inserts for copying/profile turning with 47°

Coating: X800 (successor to coating GN39)

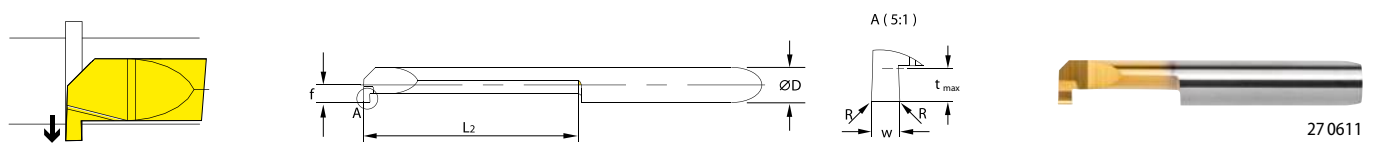


27 0591

Ø D _{min}	24V 27 0591	24V 27 0593	24V 27 0595	24V 27 0597	24V 27 0599	24V 27 0601	24V 27 0603	24V 27 0605	Ø D	R	f	t _{max}
	simturn AX copying insert, right-hand				simturn AX copying insert, left-hand							
mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm	L ₂ = 25.4 mm	L ₂ = 30.5 mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm	L ₂ = 25.4 mm	L ₂ = 30.5 mm	mm	mm	mm	mm
2,7	eShop	—	—	—	eShop	—	—	—	4	0.1	1.2	0.5
3,2	eShop	—	—	—	eShop	—	—	—	4	0.1	1.45	0.6
4,2	—	eShop	—	—	—	eShop	—	—	4	0.15	1.95	0.8
5,2	eShop	—	eShop	—	eShop	—	eShop	—	5	0.15	2.45	1
6,2	—	eShop	—	eShop	—	eShop	—	eShop	6	0.15	2.95	1.8

simturn AX cutter inserts for grooving

Coating: X800 (successor to coating GN39) No corner radius (sharp-edged).

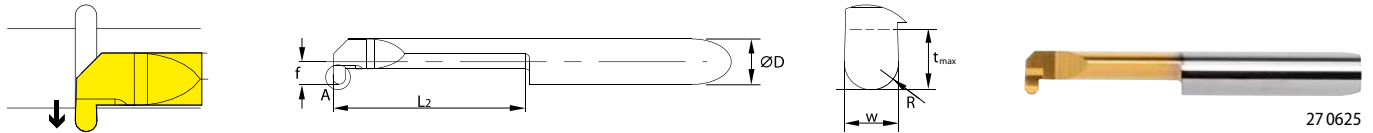


27 0611

Ø D _{min} / w	24V 27 0607	24V 27 0609	24V 27 0611	24V 27 0613	24V 27 0615	24V 27 0617	24V 27 0619	24V 27 0621	Ø D	f	t _{max}
	simturn AX grooving insert, right-hand						simturn AX grooving insert, left-hand				
mm	L ₂ = 10.2 mm	L ₂ = 12.2 mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm	L ₂ = 25.4 mm	L ₂ = 30.5 mm	L ₂ = 15.2 mm	L ₂ = 25.4 mm	mm	mm	mm
2/0,5	—	eShop	—	—	—	—	—	—	4	0.85	0.4
3/0,7	—	eShop	—	—	—	—	—	—	4	1.35	0.6
4,2/1	eShop	—	eShop	eShop	—	—	eShop	—	4	1.95	0.8
5,2/1	eShop	—	eShop	eShop	eShop	—	eShop	eShop	5	2.45	1
5,2/1,5	eShop	—	eShop	eShop	eShop	—	eShop	eShop	5	2.45	1
5,2/2	eShop	—	eShop	eShop	eShop	—	eShop	eShop	5	2.45	1
6,2/1	eShop	—	eShop	eShop	eShop	—	eShop	eShop	6	2.95	1.8
6,2/1,5	eShop	—	eShop	eShop	eShop	—	eShop	eShop	6	2.95	1.8
6,2/2	eShop	—	eShop	eShop	eShop	—	eShop	eShop	6	2.95	1.8
7,2/1	eShop	—	eShop	eShop	eShop	eShop	eShop	eShop	7	3.45	2.5
7,2/1,5	eShop	—	eShop	eShop	eShop	eShop	eShop	eShop	7	3.45	2.5
7,2/2	eShop	—	eShop	eShop	eShop	eShop	eShop	eShop	7	3.45	2.5

simturn AX cutter inserts for grooving full radius grooves

Coating: X800 (successor to coating GN39)



Ø D _{min} / W	24U 27 0623	24U 27 0625	24U 27 0627	24U 27 0629	24U 27 0631	24U 27 0633	24U 27 0635	24U 27 0637	Ø D	R	f	t _{max}
	simturn AX grooving insert, full radius right-hand				simturn AX grooving insert, full radius left-hand							
mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm	L ₂ = 25.4 mm	L ₂ = 30.5 mm	L ₂ = 15.2 mm	L ₂ = 20.3 mm	L ₂ = 25.4 mm	L ₂ = 30.5 mm	mm	mm	mm	mm
4,2/1	eShop	—	—	—	eShop	—	—	—	4	0.5	1.95	0.8
5,2/1	—	eShop	—	—	—	eShop	—	—	5	0.5	2.45	1
5,2/1,5	—	eShop	—	—	—	eShop	—	—	5	0.75	2.45	1
5,2/2	—	eShop	—	—	—	eShop	—	—	5	1	2.45	1
6,2/1	—	—	eShop	—	—	—	eShop	—	6	0.5	2.95	1.8
6,2/1,5	—	—	eShop	—	—	—	eShop	—	6	0.75	2.95	1.8
6,2/2	—	eShop	eShop	—	—	eShop	eShop	—	6	1	2.95	1.8
7,2/1	—	—	—	eShop	—	—	—	eShop	7	0.5	3.45	2.5
7,2/1,5	—	—	—	eShop	—	—	—	eShop	7	0.75	3.45	2.5
7,2/2	—	—	—	eShop	—	—	—	eShop	7	1	3.45	2.5

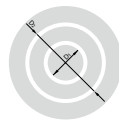
simturn AX cutter inserts for axial grooving

Coating: X800 (successor to coating GN39)

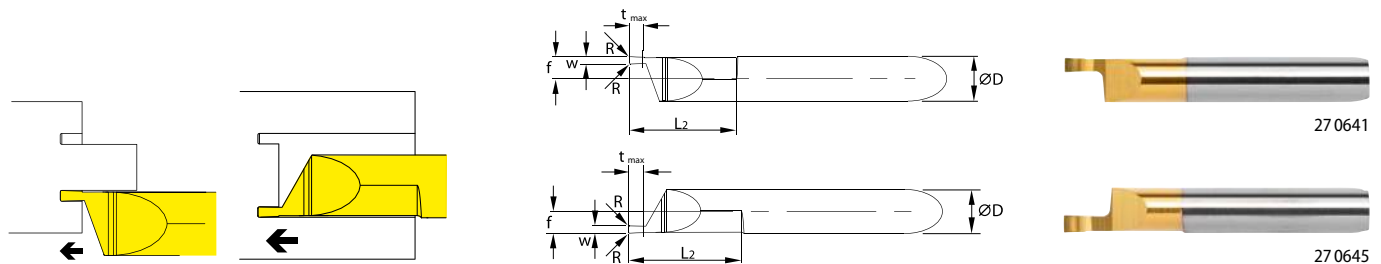
Attention: Larger groove diameters can be achieved without modifications.

D₁ = D_{min} internal diameter.

D₂ = D_{min} external diameter.



Ø range Groove D ₁ / D ₂	24U 27 0639	Ø D	f	t _{max}	w
	simturn AX axial grooving insert, right-hand				
mm		mm	mm	mm	mm
3/4	eShop	4	2.2	1.6	0.5
4/5	eShop	4	2.2	1.6	0.5
4/6	eShop	4	2.2	3.3	1

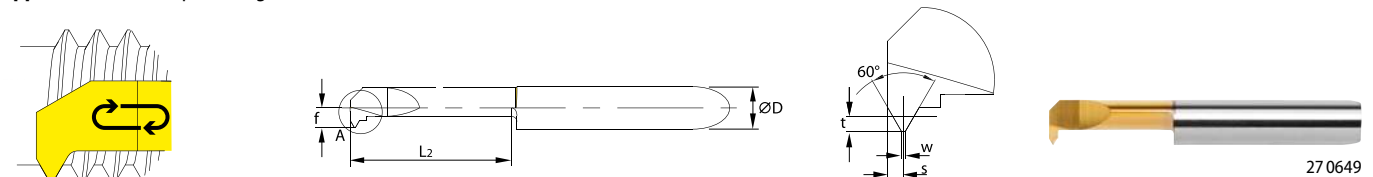


Ø D _{min} / w	24U 27 0641	24U 27 0643	24U 27 0645	24U 27 0647	Ø D	R	f	t _{max}
	simturn AX axial grooving insert at pin, right-hand	simturn AX axial grooving insert at pin, left-hand	simturn AX axial grooving insert at bore, right-hand	simturn AX axial grooving insert at bore, left-hand				
mm	L ₂ = 15.2 mm	L ₂ = 15.2 mm	L ₂ = 15.2 mm	L ₂ = 15.2 mm	mm	mm	mm	mm
6,2/1	eShop	eShop	eShop	eShop	6	0.15	2.95	2
6,2/1,5	eShop	eShop	eShop	eShop	6	0.15	2.95	3
6,2/2	eShop	eShop	eShop	eShop	6	0.15	2.95	4
6,2/2,5	eShop	eShop	eShop	eShop	6	0.15	2.95	5
6,2/3	eShop	eShop	eShop	eShop	6	0.15	2.95	6

simturn AX cutter inserts for thread turning

Coating: X800 (successor to coating GN39)

Application: For producing metric ISO internal threads.



Type	24U 27 0649	Ø D _{min}	Ø D	Pitch	f	t	w	S
	simturn AX thread turning insert, partial profile, 60°, internal, right-hand							
	L ₂ = 15.2 mm	mm	mm	mm	mm	mm	mm	
1	eShop	3.24	4	0.7	—	0.38	0.09	0.32
2	eShop	3.9	4	0.8 – 1	1.95	0.46	0.1	0.45
3	eShop	4.2	4	0.5 – 0.7	1.95	0.4	0.06	0.35
4	eShop	4.8	5	1 – 1.25	2.25	0.7	0.12	0.55
5	eShop	5.1	5	0.75 – 1	2.4	0.57	0.09	0.45
6	eShop	5.2	5	0.5 – 0.75	2.45	0.43	0.06	0.35
7	eShop	6.2	6	1 – 1.25	2.95	0.7	0.12	0.55
8	eShop	6.2	6	1.25 – 1.5	2.95	0.84	0.16	0.75
9	eShop	6.2	6	1.5 – 1.75	2.95	0.98	0.18	0.8



27

i





MINCUT

The flexible system for axial and internal machining of small and medium-sized components.

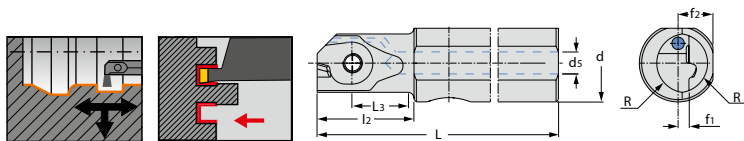
- Can be used from 8 mm bore diameter.
- Groove widths of 1.5 mm – 3.5 mm.
- Groove depths of up to 15 mm possible.
- Optimum chip evacuation thanks to soft-cutting geometry and targeted coolant supply into the cutting zone.
- Stable and accurately repeatable screw clamping thanks to defined contact surfaces between the tool and the cutter insert.



MINCUT boring bar

Suitable for: Inserts No. 270422 – 270429.

Application: For face grooving and groove turning in the diameter range 8 mm – 17 mm.



270420

Shank Ø / insert size	261	27 0420	L ₃	f ₁	L	f ₂	I ₂	R
		MINCUT boring bar						
mm		right-hand	mm	mm	mm	mm	mm	mm
10/8		—	7.4	1.4	102.5	4.5	12.5	3.8
12/8		—	7.4	1.4	102.5	5.5	12.5	3.8
12/10		—	11.2	2.4	90	5.5	17.2	4.6
16/10		—	11.2	2.4	90	7.5	17.2	4.6
16/15		—	12.5	2.7	100	7.5	19	10.3
20/15		—	12.5	4.7	100	9	19	11.3



MINCUT inserts

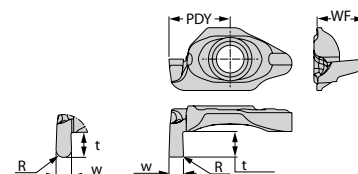
Suitable for: Boring bar No. 270420.

MIGR inserts

For internal grooving at low cutting depth.



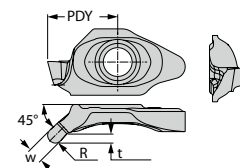
270422



Groove width w / insert size	261	27 0422		Ø D _{min}	t _{max}	Corner radius R	WF	a _p	f when turning	f when parting off
		MINCUT MIGR inserts								
mm		neutral		mm	mm	mm	mm	mm	mm/rev.	mm/rev.
1/8		—	10	8.5	1.4	0.05	4	0.05 – 0.5	0.03 – 0.1	0.01 – 0.03
1,5/8		—	10	9.2	2.1	0.05	4.7	0.05 – 0.5	0.03 – 0.1	0.01 – 0.03
2/8		—	10	8.9	1.8	0.1	4.4	0.05 – 0.5	0.03 – 0.1	0.01 – 0.03
●		UNI								
⚙		●								
v _c main application mm/min		80 – 140								

MIUR inserts

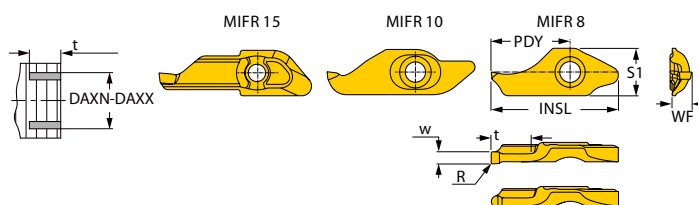
With full radius for 45° internal undercutting.



Groove width w / insert size	26J	27 0425		$\varnothing D_{min}$	t_{max}	Corner radius R	WF	a_p	f when turning	f when parting off
MINCUT MIUR inserts										
mm		Full radius IC908		mm	mm	mm	mm	mm	mm/rev.	mm/rev.
1/8		—	10	8	1.1	0.5	3.6	0.03 – 0.5	0.03 – 0.1	0.01 – 0.03
1,5/8		—	10	8.1	1.2	0.75	3.6	0.03 – 0.5	0.03 – 0.1	0.01 – 0.03
2/8		—	10	8.3	1.36	1	3.6	0.03 – 0.5	0.03 – 0.1	0.01 – 0.03
●		UNI								
⚙		●								
v_c main application mm/min		80 – 140								

MIFR inserts

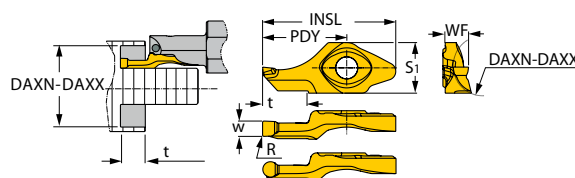
For internal face grooving and turning.



Groove width w / insert size	26J	27 0426	26J	27 0427		t _{max}	Corner radius R		WF		INSL	DAXN-DAXX		f when axial grooving	f when facing
	MINCUT MIFR inserts														
	neutral IC908		Full radius IC908				27 0426	27 0427	27 0426	27 0427		27 0426	27 0427		
mm					mm	mm	mm	mm	mm	mm	mm	mm	mm	mm/rev.	mm/rev.
1,5/8	—		—		10	5.5	0.2	—	2.6	—	17.7	8 – 11.5	—	0.02 – 0.1	0.02 – 0.06
1,6/8	—		—		10	5.5	—	0.8	—	2.6	17.7	—	8 – 12.1	0.02 – 0.1	0.02 – 0.06
2/8	—		—		10	5.5	0.2	—	2.8	—	17.7	8 – 16	—	0.02 – 0.1	0.02 – 0.06
2,2/8	—		—		10	5.5	0.2	—	2.9	—	17.7	8 – 21	—	0.02 – 0.1	0.02 – 0.06
2/10	—		—		10	9	0.2	1	3	3	25.1	10 – 999	10 – 999	0.02 – 0.1	0.02 – 0.06
2,5/10	—		—		10	9	0.2	1.25	3.1	3.3	25.1	10 – 30	10 – 34	0.02 – 0.1	0.02 – 0.06
3/10	—		—		10	9	0.2	1.5	3.4	5.55	25.1	10 – 30	12 – 47	0.02 – 0.1	0.02 – 0.06
2,5/15	—		—		10	9	0.2	—	5.55	—	30	15 – 60	—	0.03 – 0.05	0.03 – 0.04
3/15	—		—		10	15	0.2	1.5	5.85	5.85	30	15 – 60	10 – 999	0.03 – 0.05	0.03 – 0.04
		UNI		UNI											
															
v _c main application mm/min		80 – 140		80 – 140											

MEFL inserts

For external face grooving and turning next to shafts.



Groove width w / insert size	26J	27 0428	26J	27 0429		t _{max}	Corner radius R		WF		INSL	DAXN-DAXX		f when parting off	f when axial grooving	f when facing
	MINCUT MEFL inserts						27 0428 27 0429		27 0428 27 0429			27 0428 27 0429		27 0428 mm/rev.	27 0428 mm/rev.	27 0428 mm/rev.
	neutral IC908	Full radius IC908	mm	mm												
mm					mm	mm	mm	mm	mm	mm	mm	mm	mm	mm/rev.	mm/rev.	mm/rev.
1,5/8		—		—	10	5.5	0.2	—	2.6	—	17.4	8 – 15	—	2.6	0.02 – 0.1	0.02 – 0.06
1,6/8		—		—	10	5.5	—	0.8	—	2.7	17.4	—	7 – 12.1	—	0.02 – 0.1	0.02 – 0.06
2/8		—		—	10	5.5	0.2	1	3.1	2.9	17.4	7 – 20	7 – 14	3.1	0.02 – 0.1	0.02 – 0.06
2,2/8		—		—	10	5.5	0.2	—	3.1	—	17.4	7 – 20	—	3.1	0.02 – 0.1	0.02 – 0.06
2,5/10		—		—	10	9	0.2	1.25	3.15	3.15	24.5	10 – 45	10 – 45	3.15	0.02 – 0.06	0.02 – 0.05
3/10		—		—	10	9	0.2	1.5	—	—	24.5	10 – 100	—	3.6	0.02 – 0.06	0.02 – 0.05
		UNI		UNI												
																
v _c main application mm/min		60 – 180		60 – 180												



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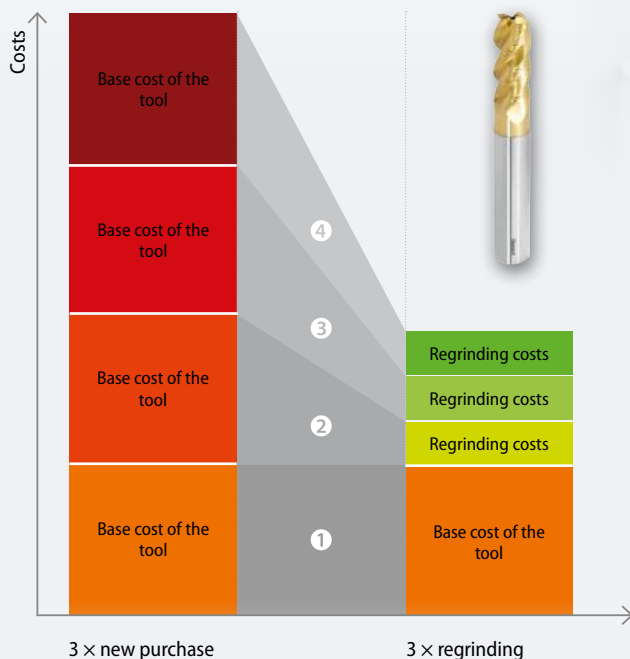


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27

Thread standards for our catalogue range.

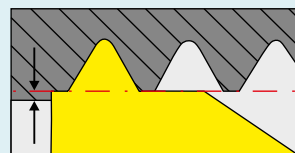
Special solutions and other thread standards can be provided upon request – simply contact us for more details!

Cutting sketch	Profile	Thread type	Pitch of full profile		Pitch of semi-profile	Pitch of partial profile		Insert size	Catalogue page
			mm	TPI		mm	TPI		
	60°	Metric	external	0.5 – 6		0.5 – 5		11 – 22	844 – 845
			internal	0.5 – 6		0.5 – 5		6 – 22	844 / 846
	55°	Inch	external		28 – 11		48 – 5	11 – 16	844 / 847
			internal		28 – 11		48 – 8	6 – 16	847
	30°	Trapezoidal	external			2 – 6		16 – 22	848
			internal			2 – 6		16 – 22	848
	60°	UN	external		20 – 8			16	848
			internal		20 – 8			11 – 16	848
	60°	NPT	external		18 – 8			16	848
			internal		18 – 8			11 – 16	848
	30°	Round DIN 405	external		10 – 4			16 – 22	849
			internal		10 – 4			16 – 22	849

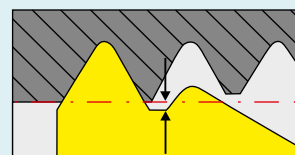
Carbide grades:

Grade designation	Application		Description
HB7010	P	M	- Multi-layer coating - Very good edge sharpness - Use for uninterrupted cutting - Universal use for steel up to < 55 HRC
	O	N	
HB8015	P	M	- AlTiN, PVD coating - Multi-purpose micro-grain grade - Extended contour grinding to reduce burrs
	O	N	
HB7020	P	M	- TiAlN coating - Fine-grain substrate - Optimised chip evacuation - Very high wear resistance - Good tensile strength - Universal use for steel up to < 55 HRC
	O	N	
HB7125	M	S	- AlTiN, multi-layer PVD coating - Specially adapted for stainless steels - Also suitable for Inconel when used with cutting oil
HU7315	N	Ti	- Uncoated - Especially for aluminium and titanium alloys

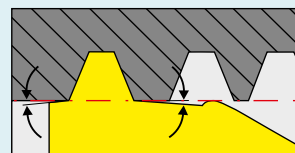
Differentiation between full, partial and semi-profile:



With **full profile** threading inserts the entire thread is cut in full with the outer or inner Ø without any additional operations. The threads produced are burr-free and true to DIN/ISO gauge.



Partial profile threading inserts cover a wide range of different pitches. However, they do not produce true to gauge threads according to DIN/ISO, since the profile radius does not match the respective pitch.



Semi-profile threading inserts cut the complete profile and deburr the tips of the thread flanks. The external or internal Ø is not cut with the profile.

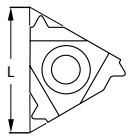
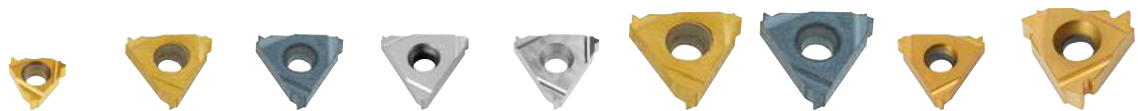
Garant Thread turning – error analysis and solutions


Problem		Possible cause		Solution
Increased wear on the flank faces		Excessively high cutting speed	▶	Lower cutting speed / use coated cutter insert
		Insufficient cutting depth / too many passes	▶	Increase the cutting depth per pass
		Unsuitable carbide grade	▶	Use a coated carbide grade
		Insufficient cooling	▶	Increase coolant flow
Uneven wear along the cutting edge		Incorrect pitch angle	▶	Use the correct shim
		Incorrect infeed method	▶	Use alternate infeeds
Extreme plastic deformation		Cutting depth too high	▶	Reduce the cutting depth / increase the number of passes
		Insufficient cooling	▶	Increase coolant flow
		Excessively high cutting speed	▶	Reduce cutting speed
		Unsuitable carbide grade	▶	Use a harder carbide substrate
		Corner radius too small	▶	Select a larger corner radius
Fracture of the cutting edge		Cutting depth too high	▶	Reduce the cutting depth / increase the number of passes
		Extreme plastic deformation	▶	Reduce cutting speed
		Insufficient cooling	▶	Increase the flow rate and adjust the flow direction
		Unsuitable carbide grade	▶	Use a tougher carbide substrate
		General instability	▶	Check/improve the system stability
Built-up edge		Cutting speed incorrect	▶	Adjust the cutting speed
		Unsuitable carbide grade	▶	Use a coated carbide grade
Thread profile too flat		Point height incorrect	▶	Correct the point height
		Cutter insert does not machine the threaded point	▶	Measure the workpiece Ø
		Cutter insert is worn	▶	Replace the cutter insert in good time
Poor surface quality		Excessively low cutting speed	▶	Increase cutting speed
		Shim incorrect	▶	Use the correct shim
		Unsuitable infeed method	▶	Use alternate or radial infeed

Infeed methods

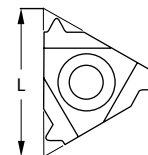
Infeed method		Recommended for		Advantage
Radial infeed		■ Pitches up to 1 mm ■ Short-chipping material ■ Cold-formed or hard material	▶	■ Easy to use ■ Also on conventional machines
Flank infeed		■ Pitches > 1 mm (24 TPI) ■ Trapezoidal thread.	▶	■ Good chip clearance
Modified flank infeed		■ Pitches > 1 mm (24 TPI) ■ Trapezoidal thread	▶	■ Good chip clearance ■ Reduces forces on the flank side
Alternative flank infeed		■ Cutter inserts with small radii ■ E.g. for NPT thread	▶	■ Good chip clearance ■ Even load/wear on both flanks



Full profile

Partial profile



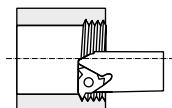


Garant Threading inserts for metric internal thread

Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
HB7010		250	180	150	150	130	100	90	40			100	100	50	130	150							
HB7020		200	180	160	160	120	90	70	30			90	90	50	120	120							
HB7125												120	120	60									
HU7315	200	100	90											50		110							

Full profile, internal

Full profile insert 60° for internal threads to DIN / ISO R 262 (DIN 13) tolerance class 6H.



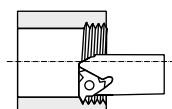
Pitch	2U 27 0749	2U 27 0750	2U 27 0752	2U 27 0754	2U 27 0756	2U 27 0758	2U 27 0759	2U 27 0763	2U 27 0762	
Full profile insert 60°, internal, right-hand										
mm	HB7020	HB7010	HB7010	HB7020	HB7010	HB7020	HB7125	HU7315	HB7010	
0,5	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	10
0,7	—	—	—	—	eShop	—	—	—	—	10
0,75	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	10
0,8	—	—	—	—	eShop	—	—	—	—	10
1	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	10
1,25	eShop	eShop	eShop	—	eShop	eShop	eShop	eShop	—	10
1,5	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	10
1,75	—	eShop	eShop	—	eShop	eShop	eShop	eShop	—	10
2	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	—	10
2,5	—	—	eShop	eShop	eShop	eShop	eShop	eShop	—	10
3	—	—	—	—	eShop	eShop	eShop	eShop	—	10
3,5	—	—	—	—	eShop	eShop	eShop	eShop	eShop	10
4	—	—	—	—	—	—	—	—	eShop	10
4,5	—	—	—	—	—	—	—	—	eShop	10
5	—	—	—	—	—	—	—	—	eShop	10
6	—	—	—	—	—	—	—	—	eShop	10
Thickness mm	1.85	2.42	3.17	3.17	3.6	3.6	3.6	3.6	4.76	
Insert size L mm	6	9.3	11	11	16	16	16	16	22	



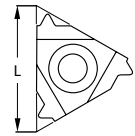
Pitch		mm	0,5	0,7	0,75	0,8	1	1,25	1,5	1,75	2	2,5	3		Thickness	Insert size L	
															mm	mm	
2U	27 0772	Full profile insert 60°, internal, left-hand	HB7010	eShop	–	eShop	–	eShop	–	eShop	–	eShop	eShop	–	10	3.17	11
2U	27 0776		HB7010	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	3.6	16

Partial profile, internal

Partial profile insert 60° for internal threads.



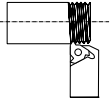
Pitch	2U 27 0789	2U 27 0790	2U 27 0791	2U 27 0792	2U 27 0794	2U 27 0796	2U 27 0797	
Partial profile insert 60°, internal, right-hand						Partial profile insert 60°, internal, left-hand		
mm	HB7020	HB7010	HB7010	HB7010	HB7010	HB7010	HB7010	
0,5-1,25	eShop	—	—	—	—	—	—	10
0,5-3	—	—	—	eShop	—	—	eShop	10
0,5-1,5	—	eShop	eShop	eShop	—	eShop	eShop	10
1,75-3	—	—	—	eShop	—	—	eShop	10
3,5-5	—	—	—	—	eShop	—	—	10
Thickness mm	1.85	2.42	3.17	3.6	4.76	3.17	3.6	
Insert size L mm	6	9.3	11	16	22	11	16	



Garant Threading inserts for imperial thread

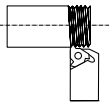
Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N					
HB7010		250	180	150	150	130	100	90	40			100	100	50	130	150			●	○	●	○
HB7020		200	180	160	160	120	90	70	30			90	90	50	120	120			○	●	●	○
HB7125												120	120	60					●	●	●	●
HU7315	200	100	90											50		110			●	●	●	●

Full profile, external



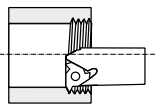
TPI	21J	27 0799	21J	27 0800	21J	27 0802	21J	27 0803	21J	27 0804	21J	27 0805	
	Full profile insert 55°, external, right-hand											Full profile insert 55°, external, left-hand	
		HB7010		HB7010		HB7020		HB7125		HU7315		HB7010	
28		eShop		eShop		eShop		eShop		eShop		eShop	10
19		eShop		eShop		eShop		eShop		eShop		eShop	10
14		eShop		eShop		eShop		eShop		eShop		eShop	10
11		—		eShop		eShop		eShop		eShop		eShop	10
Thickness	mm	3.17		3.6		3.6		3.6		3.6		3.6	
Insert size L	mm	11		16		16		16		16		16	

Partial profile, external



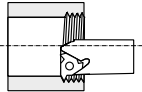
TPI	21J	27 0808	21J	27 0810	21J	27 0812	21J	27 0815	
	Partial profile insert 55°, external, right-hand						Partial profile insert 55°, external, left-hand		
		HB7010		HB7010		HB7010		HB7010	
48-16		eShop		eShop		—		eShop	10
48-8		—		eShop		—		eShop	10
14-8		—		eShop		—		eShop	10
7-5		—		—		eShop		—	10
Thickness	mm	3.17		3.6		4.76		3.6	
Insert size L	mm	11		16		22		16	

Full profile, internal



TPI		21J	27 0819	21J	27 0820	21J	27 0822	21J	27 0824	21J	27 0826	21J	27 0827	21J	27 0828	21J	27 0834	
		Full profile insert 55°, internal, right-hand														Full profile insert 55°, internal, left-hand		
		HB7020	HB7010	HB7010	HB7010	HB7020	HB7125	HU7315	HB7010									
28		—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop		10
19		eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop		10
14		—	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop		10
11		—	—	—	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop		10
Thickness	mm	1.85	2.42	3.17	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		
Insert size L	mm	6	9.3	11	16	16	16	16	16	16	16	16	16	16	16	16		

Partial profile, internal



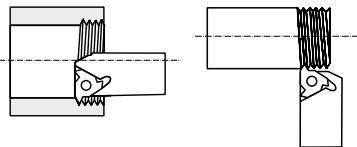
TPI	21J	27 0839	21J	27 0840	21J	27 0841	21J	27 0842	21J	27 0847	
	Partial profile insert 55°, internal, right-hand								Partial profile insert 55°, internal, left-hand		
		HB7020		HB7010		HB7010		HB7010		HB7010	
48-20		eShop		—		—		—		—	10
48-16		—		eShop		eShop		eShop		eShop	10
48-8		—		—		—		eShop		—	10
14-8		—		—		—		eShop		eShop	10
Thickness	mm	1.85		2.42		3.17		3.6		3.6	
Insert size L	mm	6		9.3		11		16		16	



Garant Threading inserts for round threads

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
27 0960–27 0984												120	120	60									

DIN 405 round thread



TPI	2TJ	27 0960	2TJ	27 0964	2TJ	27 0980	2TJ	27 0984	
		Full profile insert 30°, external, right-hand				Full profile insert 30°, internal, right-hand			
		HB7125				HB7125			
10		eShop				eShop			10
8		eShop				eShop			10
6		eShop				eShop			10
4		—				—			10
Thickness	mm	3.6				3.6			
Insert size L	mm	16				22			



Garant Threading insert sets, external / internal



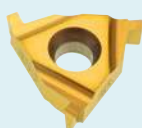
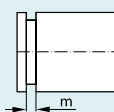
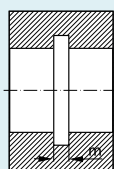
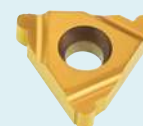
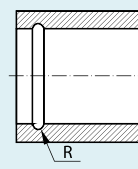
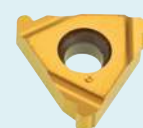
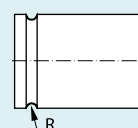
27 1900

Type	ER	IR	EL	IL
2TJ 27 1900 Threading insert set size 16 HB7010	eShop	eShop	eShop	eShop
Machining direction	right-hand	right-hand	left-hand	left-hand
Content: Full profile, metric 60°	No. 270700 size 1; 1.25; 1.5; 2; 2.5; 3	No. 270756 size 1; 1.5; 1.75; 2; 2.5; 3	No. 270720 size 1; 1.25; 1.5; 2; 2.5; 3	No. 270776 size 1; 1.5; 1.75; 2; 2.5; 3
Partial profile, metric 60°	No. 270740 size 0.5- 1.5; 1.75-3	No. 270792 size 0.5- 1.5; 1.75-3	No. 270745 size 0.5- 1.5; 1.75-3	No. 270797 size 0.5- 1.5; 1.75-3
Full profile, BSW 55°	No. 270800 size 14; 11	No. 270824 size 14; 11	No. 270805 size 14; 11	No. 270834 size 14; 11

Garant Profile turning inserts for threading tool holder – see page 883

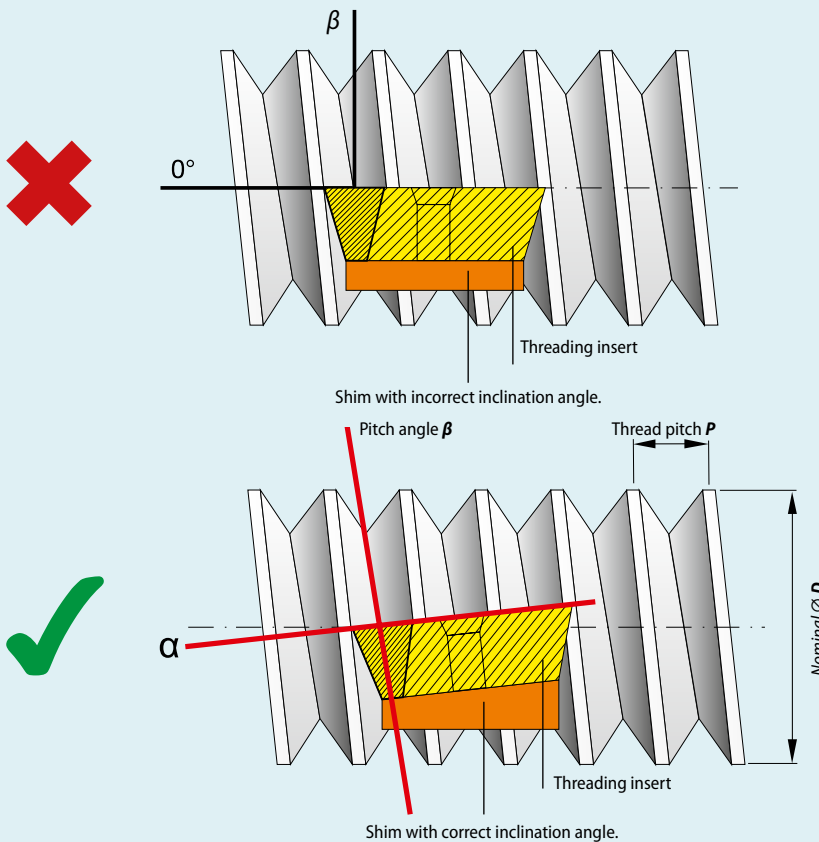
i

27

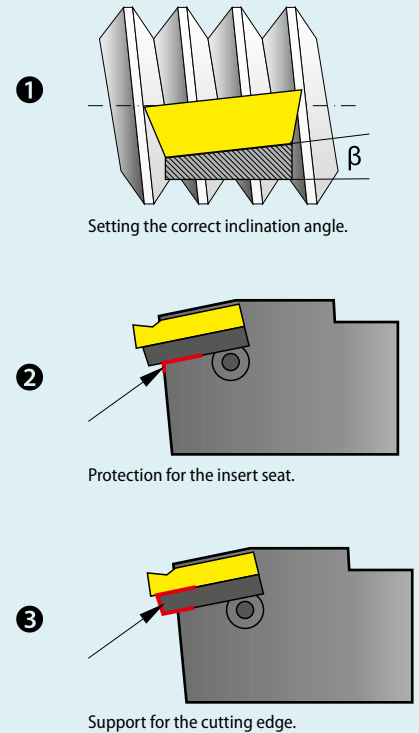
DIN
471DIN
472DIN
7993

Garant Determination of the necessary inclination angle

The insert inclination angle α must correspond with the thread pitch angle β as exactly as possible. Only by this means can maximum profile accuracy and best surface quality be achieved. At the same time the evenness of the wear increases the working life of the insert.



Three important factors for the shim:



Determination of the necessary inclination angle using the formula

Metric:

Inch:

Example:

$$\alpha \approx \frac{20 \times P}{D}$$

$$\alpha \approx \frac{508}{D \times \text{threads per inch}}$$

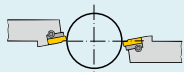
Thread pitch $P = 2$
Nominal $\varnothing D = 30 \text{ mm}$

$$\alpha \approx \frac{20 \times 2}{30} = 1.33^\circ$$

Result:

The suitable shim has a 1.5° inclination. Machining can be performed using the standard shim.

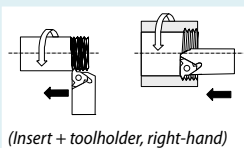
Determination of the necessary inclination angle using the diagram



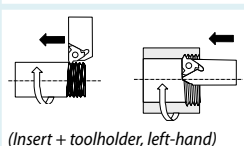
also applies when overhead toolholders are used

Feed towards chuck

Right-hand thread

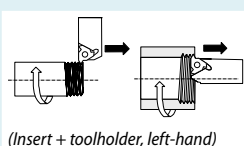


Left-hand thread

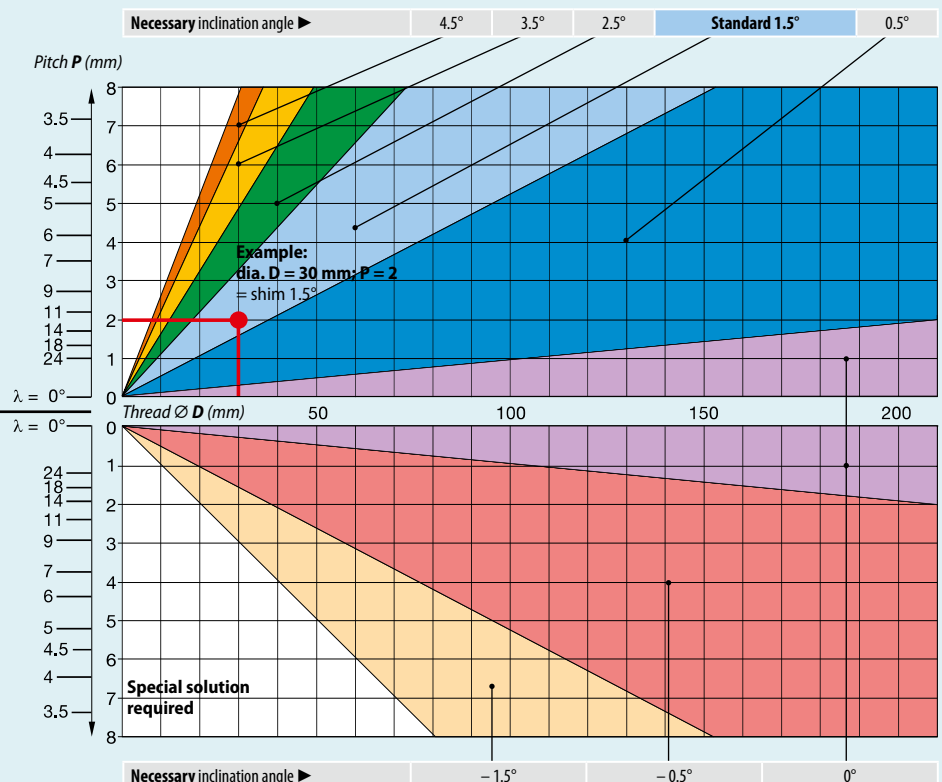
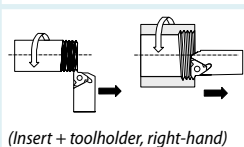


Feed towards tailstock

Right-hand thread

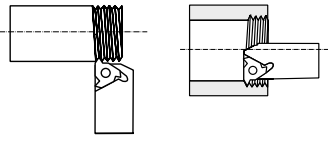


Left-hand thread



Garant Shims with correction angle

Note: Toolholders that have no fixed angle of inclination are supplied as standard with a 1.5° shim.



For external (ER/EL) and internal (IR/IL) threads

27 2600 – For right-hand external thread (ER) and left-hand internal thread (IL).

27 2606 – For right-hand external thread (EL).

27 2610/2616 – For left-hand external thread (EL) and right-hand internal thread (IR).

Application: For the production of standard-compliant threads. Use in conjunction with threading inserts No. 270700 – 271900 and 271970 – 271980.



Inclination angle	27 2600	27 2610	27 2606	27 2616	Angle as in graph
	Shim for screw-on toolholders and boring bars				
	ER/IL	EL/IR	ER	EL/IR	
degrees					
-1,5	eShop	eShop	eShop	eShop	
-0,5	eShop	eShop	eShop	eShop	
0	eShop	eShop	eShop	eShop	
0,5	eShop	eShop	eShop	eShop	
1,5	eShop	eShop	eShop	eShop	
2,5	eShop	eShop	eShop	eShop	
3,5	eShop	eShop	eShop	eShop	
4,5	eShop	eShop	eShop	eShop	
for insert size L	mm	16	16	22	22

For profile turning inserts

27 2604 – Use only in conjunction with profile inserts No. 271005 and 271025.

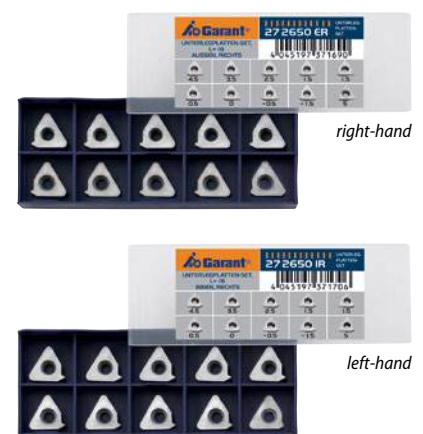
27 2624 – Use only in conjunction with profile inserts No. 271015 and 271035.



Inclination angle	27 2604	27 2624
	Shim for screw-on toolholder	Shim for boring bars
	Profile turning external right-hand	Profile turning internal right-hand
degrees		
S	eShop	eShop
for insert size L	mm	16

Shim sets

Type	ER	IR	EL	IL	for insert size L
					mm
27 2650	eShop	eShop	eShop	eShop	16
27 2660	eShop	—	eShop	—	22
Machining direction	right-hand	right-hand	left-hand	left-hand	
Content:	No. 272600	No. 272610	No. 272610	No. 272600	
10 pieces (27 2650)	size -1.5; -0.5; 0; 0.5;	Size -1.5; -0.5; 0; 0.5;	size -1.5; -0.5; 0; 0.5;	Size -1.5; -0.5; 0; 0.5;	
	2×1.5; 2.5; 3.5; 4.5	2×1.5; 2.5; 3.5; 4.5	3×1.5; 2.5; 3.5; 4.5	3×1.5; 2.5; 3.5; 4.5	
	No. 272604 size S	No. 272624 size S			
10 pieces (27 2660)	No. 272606	—	No. 272616	—	
	size -1.5; -0.5; 0; 0.5;		size -1.5; -0.5; 0; 0.5;		
	3×1.5; 2.5; 3.5; 4.5		3×1.5; 2.5; 3.5; 4.5		



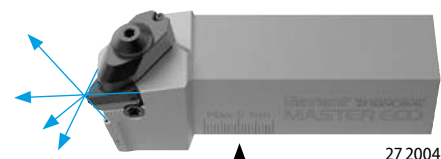


Garant GARANT Master Eco clamping toolholder for thread turning inserts

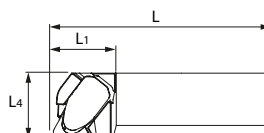
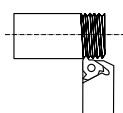
Highly efficient cooling directly on the cutter and additional flank face cooling.

Supplied with: With shim 1.5°.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holder No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



Positioning within the scale ensures precise coolant transfer.



Shank size / insert size L	27 2004	27 2005	L ₄	L ₁	L	Shim 1.5°		Shim screw	Clamp, screw, O-ring	
	right-hand	left-hand				27 2004	27 2005		27 2004	27 2005
mm			mm	mm	mm					
20/16	eShop	eShop	25	30	90	272600 1.5	272610 1.5	279824 1	279835 3	279835 4
25/16	eShop	eShop	32	30	100	272600 1.5	272610 1.5	279824 1	279835 3	279835 4

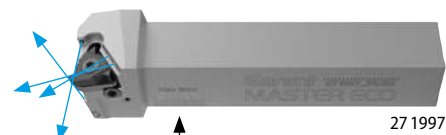


Garant GARANT Master Eco screw-on toolholder for thread turning inserts

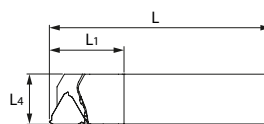
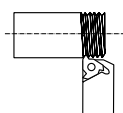
Highly efficient cooling directly on the cutting edge and additional flank face cooling.

Supplied with: With shim 1.5°.

Note: Coolant transfer via slot on the underside of the shank in conjunction with GARANT Master Eco holder No. 319006 – 319136 or No. 317900 for shank length < 125 mm. Optional connection possibility via hose connection (G 1/8 inch) No. 269207 and 269208.



Positioning within the scale ensures precise coolant transfer.



Shank size / insert size L	27 1997	27 1998	L ₄	L ₁	L	Clamping screw	Shim 1.5°		Clamping screw for shim
	right-hand	left-hand					27 1997	27 1998	
mm			mm	mm	mm				
16/16	eShop	eShop	20	30	80	269023 3	272600 1.5	272610 1.5	279824 1
20/16	eShop	eShop	25	30	90	269023 3	272600 1.5	272610 1.5	279824 1
25/16	eShop	eShop	32	30	100	269023 3	272600 1.5	272610 1.5	279824 1
25/22	eShop	eShop	32	30	100	269023 4	272606 1.5	272616 1.5	279824 2

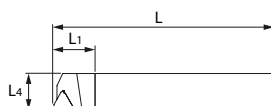
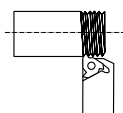


Garant Screw-on toolholders for threading inserts

Supplied with: With shim 1.5°.

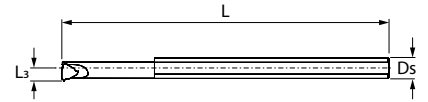
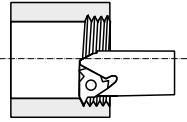


27 2001



Shank size / insert size L	27 2001	27 2002	L ₄	L ₁	L	Clamping screw	Shim 1.5°		Clamping screw for shim
	right-hand	left-hand					27 2001	27 2002	
mm			mm	mm	mm				
12/16	eShop	eShop	16	22	83	279810 2	272600 1.5	272610 1.5	279824 1
16/16	eShop	eShop	16	20	97	279810 2	272600 1.5	272610 1.5	279824 1
20/16	eShop	eShop	20	30	128	279810 2	272600 1.5	272610 1.5	279824 1
25/16	eShop	eShop	25	30	153	279810 2	272600 1.5	272610 1.5	279824 1
32/16	eShop	eShop	32	30	173	279810 2	272600 1.5	272610 1.5	279824 1
25/22	eShop	eShop	25	36	155	279810 3	272606 1.5	272616 1.5	279824 2
32/22	eShop	eShop	32	36	175	279810 3	272606 1.5	272616 1.5	279824 2

Garant Boring bars for threading inserts



With fixed 0.5° inclination angle



27 2091_25/11

Overhang / insert size L	27 2091	27 2132	Ø D _s	Ø D _{min}	L ₃	L	Insert screw
	Boring bar with fixed 0.5° inclination angle						
mm	right-hand	left-hand	mm	mm	mm	mm	
25/11	eShop	eShop	12	13	7.3	100	279810 4
32/11	eShop	eShop	16	16	8.9	100	279810 4

With fixed 1.5° inclination angle



Application:

Size 32/16 – For coarse threads M20×2.5; M22×2.5 and M24×3.



27 2111_32/16

Overhang / insert size L	27 2111	27 2142	Ø D _s	Ø D _{min}	L ₃	L	Insert screw
	Boring bar with fixed 1.5° inclination angle						
mm	right-hand	left-hand	mm	mm	mm	mm	
25/11	eShop	eShop	20	13	7.3	180	279810 4
60/11	eShop	—	10	13	7.3	100	279810 4
32/16	eShop	eShop	20	17	10.3	180	279810 5
40/16	eShop	eShop	20	20	11.5	180	279810 5
100/16	eShop	—	16	20	11.3	150	279810 5

With fixed 2.5° inclination angle

Size 26/6 – Solid carbide shank.

Size 26/6; 32/16 – With internal cooling.

Application:

Size 32/16 – For coarse threads M20×2.5; M22×2.5 and M24×3.

Note:

Size 44/9,3 – Overhang adjustable from 8 mm – 44 mm.



27 2101_22/9.3



Adjustable from 8 – 40 mm.

27 2101_44/9.3



27 2101_32/16

Overhang / insert size L	27 2101	Ø D _s	Ø D _{min}	L ₃	L	Insert screw
	Boring bar with fixed 2.5° inclination angle					
mm	right-hand	mm	mm	mm	mm	
12/6	eShop	12	6.35	—	100	279810 6
26/6	eShop	6	6.35	—	100	279810 6
22/9,3	eShop	10	8	—	87	279810 7
31/9,3	eShop	10	8	—	97	279810 7
43/9,3	eShop	10	8	—	109	279810 7
44/9,3	eShop	16	8	—	100	279810 7
32/16	eShop	20	17	10.3	180	279810 5

With fixed 3° inclination angle



Application:

For coarse threads M16×2 and M18×2.5.



27 2121_25/11

Overhang / insert size L	27 2121	Ø D _s	Ø D _{min}	L ₃	L	Insert screw
	Boring bar with fixed 3° inclination angle					
mm	right-hand	mm	mm	mm	mm	
25/11	eShop	20	13	7.3	180	279810 4

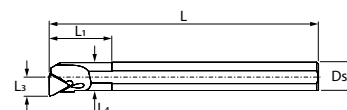


27

Variable inclination angle with shim



Supplied with: With shim 1.5°.



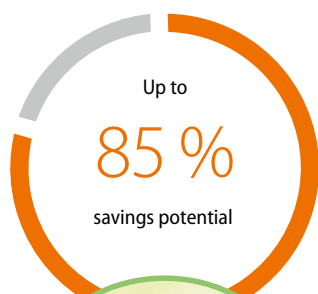
272171_120/16

Overhang / insert size L	21W	27 2171	21W	27 2172	Ø D _s	Ø D _{min}	L ₃	L	L ₄	L ₁	Insert screw	Shim 1.5°		Shim screw
	Boring Bar											27 2171	27 2172	
mm		right-hand		left-hand	mm	mm	mm	mm	mm	mm				
45/16		eShop		eShop	25	29	16.1	200	24.6	100	279810 2	272610 1.5	272600 1.5	279824 1
60/16		eShop		eShop	32	29	16.3	250	25	60	279810 2	272610 1.5	272600 1.5	279824 1
120/16		eShop		eShop	20	24	13.4	180	20	80	279810 2	272610 1.5	272600 1.5	279824 1
135/22		eShop		—	25	32	17.2	200	24.6	100	279810 3	272616 1.5	—	279824 2
170/22		eShop		—	32	39	21.5	250	32	128	279810 3	272616 1.5	—	279824 2



Hoffmann Group

Regrinding service



Good for you

It is already worth it from the first regrind. Overall, you can expect amazing savings of up to 85 %. And all with the original grind quality, to the original geometry and on the original production machines. There are no compromises here. **In addition:** Of course, we also provide you with excellent regrinding results for your third-party brands!

Good for the environment

Reusing the tool saves valuable resources and avoids unnecessary waste. In addition, the shorter transport distances also ensure a reduced CO₂ footprint. A good contribution to environmental protection.

Just good all round

Pick-up and delivery service, coating service, measurement certificate service, labelling service. **An all-round worry-free package has never been so easy – and with maximum cost transparency.** For you, this means the highest precision and reliability as quickly as possible.

It's that simple.



1

Request and have a system box picked up.



2

We check and process your tools.

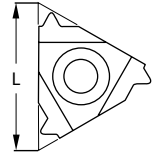


3

You will receive your tools back ready for use.

HOLEX Threading inserts

Fully sintered.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
27 1970–27 1980		220	150	120	120	120	85	75	35			60	60	40	110	130							

Metric thread

DIN 13 6H	M	MF	60°
--------------	---	----	-----

Thread pitch	mm	1	1,5	2	2,5	3	Thickness mm	Insert size L mm
22B 27 1970	Full profile insert 60°, external, right-hand	HB F20	eShop	eShop	eShop	eShop	10	3.68
22B 27 1972	Full profile insert 60°, internal, right-hand	HB F20	eShop	eShop	eShop	eShop	10	3.68



27 1970

Thread pitch	mm	0,5-3	1-3	Thickness mm	Insert size L mm
22B 27 1974	Partial profile insert 60°, external, right-hand	HB F20	eShop	10	3.68
22B 27 1976	Partial profile insert 60°, internal, right-hand	HB F20	eShop	10	3.68



27 1974

Imperial thread

BSP	BSW	G	55°
-----	-----	---	-----

TPI		14	11	Thickness mm	Insert size L mm
22B 27 1978	Full profile insert 55°, external, right-hand	HB F20	eShop	10	3.68
22B 27 1980	Full profile insert 55°, internal, right-hand	HB F20	eShop	10	3.68



27 1978

HOLEX Screw-on toolholders for threading inserts

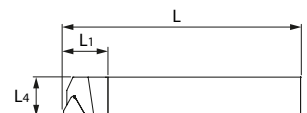
External machining

Supplied with: With shim 1.5°.



27 2015

Shank / insert size	22B	27 2015	L ₄	L ₁	L	Spare parts set
		Screw-on toolholder				
mm		right-hand	mm	mm	mm	
16/16		eShop	16	22	125	279981 1
20/16		eShop	20	22	125	279981 1
25/16		eShop	25	27	150	279981 1



Internal machining

With fixed 1.5° inclination angle.



27 2185

Shank Ø / insert size	22B	27 2185	Ø D _{min}	L ₃	L	Spare parts set
		Boring bar				
mm		right-hand	mm	mm	mm	
16/16		eShop	20	10.25	150	279981 2
20/16		eShop	25	13.3	180	279981 2
25/16		eShop	30	16.3	200	279981 2



27

Garant

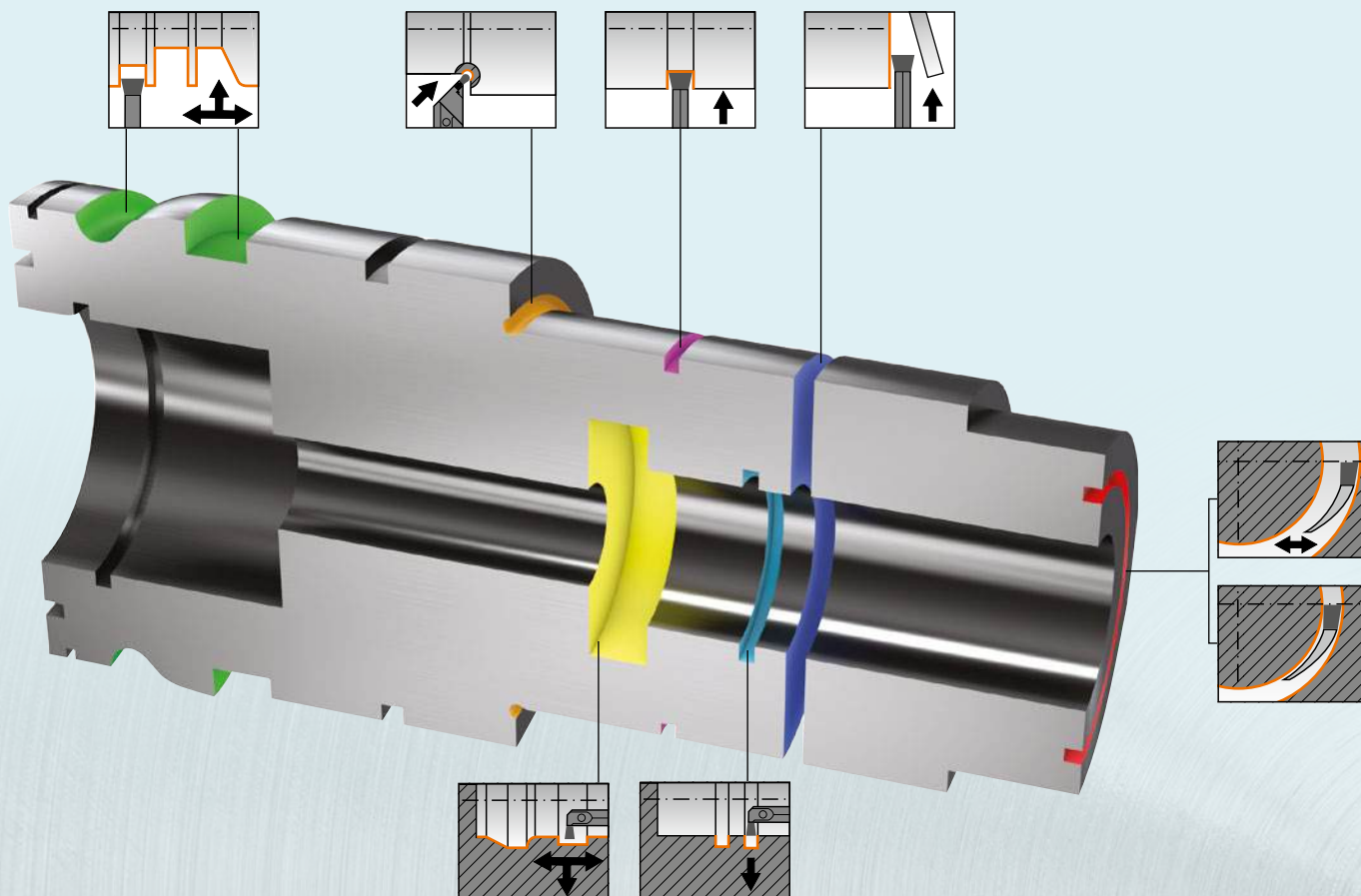
HOLEX

Member IMC Group
ISCAR

Parting off / grooving, face grooving – overview

Tool selection in a very short time.

Discover the wide range of application options of GARANT and HOLEX grooving tools at a glance.

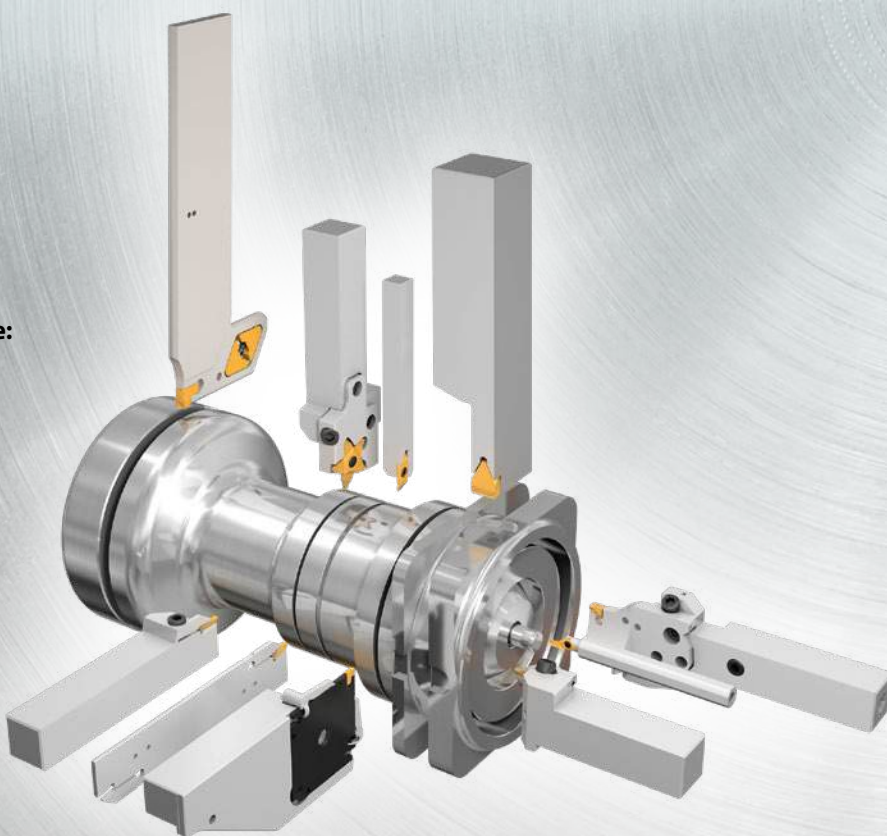
Member IMC Group
ISCAR

Complete ISCAR range for grooving.

The Hoffmann Group eShop contains the complete ISCAR range.

The following system tools are available directly from the Hoffmann Group warehouse:

ISCAR system	Catalogue page
JETCROWN	862
TANGFGRIP	862 – 863
LOGIQFGRIP	863
TANGGRIP TNG	864
DOVEIQGRIP	865
HELIGRIP	878 – 879
PENTACUT	886 – 887
PENTAIQGRIP	888
FLASHPENTA	888
MINCUT	839 – 840
TANGGRIP TNF	901





Application	Parting off						Grooving	
Colour code	external						external	
Brand	Garant	HOLEX	Garant	Garant	Garant	HOLEX	Garant	Garant
Version	Steel HSS heavy duty	Steel	Steel	Steel, reinforced	Vario plus Y grooving	Steel	Grooving toolholder mono	Vario plus modular
Suitable insert								
Number of cutting edges / insert	1	1	2	2	2	2	2	2
eco-variant	●		●	●	●		●	●
Groove depth t_{max} mm	500	50	55	45	45	32.5	37.5	28
Page(s)	860	866	867 / 869	868	893	880	870 – 873	891 – 892



Application	Grooving				Plunging		
Colour code	external		internal		external	external	
Brand	Garant	HOLEX	Garant	HOLEX	Garant	Garant	Garant
Version	Modular blade carrier	Grooving toolholder mono	Boring bar	Boring bar	Groove / full radius	Threading toolholder, profile turning	Grooving toolholder, triangular inserts
Suitable insert							
Number of cutting edges / insert	1	2	1/2	2	2	3	3
eco-variant			●			●	
Groove depth t_{max} mm	120	21	5 / 13	5	–	2	2.5
Page(s)	898	880 – 881	899 / 874	881	873	852	884

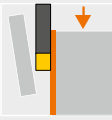
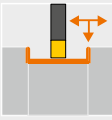


Application	Plunging		Axial grooving		Face grooving		
Colour code	inner						
Brand	Garant	Garant	Garant	Garant	Garant	HOLEX	HOLEX
Version	Internal threading bar profile turning	Boring bar triangular inserts	Carbide grooving	Medium / Heavy Duty / Heavy Duty plus	Vario plus	Steel	Steel cranked
Suitable insert							
Number of cutting edges / insert	3	3	1	1	2	2	2
eco-variant	●		●		●		
Groove depth t_{max} mm	2	2.5	43	120	28	14	14
Page(s)	853 – 854	884	889	894 – 897	891 – 892	881	882

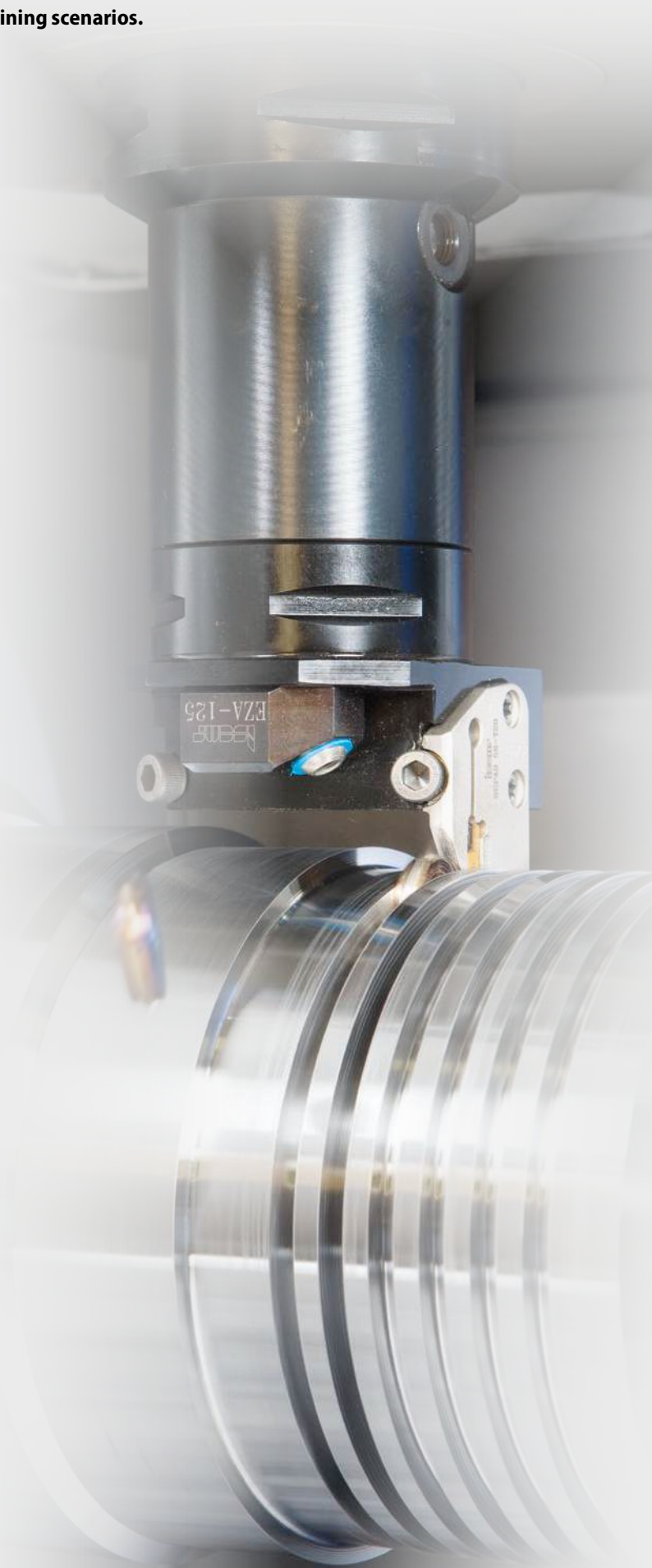


Cutting media types and cutter geometries.

ISCAR offers many options suitable for all materials and machining scenarios.

			
P (Steel)	Hard IC30N IC807 IC808 IC1010* IC5400 IC830 IC1030 Tough	Hard IC20N IC807 IC808* IC8250 IC830 Tough	Hard IC808* IC8250 IC830 Tough
M (Stainless steel)	Hard IC807 IC808 IC1010 IC5400* IC830 IC1030 Tough	Hard IC807 IC808* IC8250 IC830 IC528 Tough	Hard IC806 IC808* IC8250 IC830 Tough
O (Cast iron)	Hard IC20 IC807 IC808 IC5400* Tough	Hard IC428 IC418 IC5010* IC807 IC808 Tough	Hard IC428 IC5010* IC808 Tough
N (Non-ferrous materials)	Hard IC807 IC20* IC808 IC1010 Tough	Hard ID5 IC07 IC20* Tough	Hard IC20* IC808 Tough
S (High-alloy materials)	Hard IC807 IC808* IC1010 Tough	Hard IC804 IC806* IC807 IC808 Tough	Hard IC806* IC808 Tough

* 1st choice



Overview of chip formers for parting off

	A	P	Z	UA/UT	LF	J	JT	MF	C	CB	HF
P		✓	✓	✓	✓	✓	✓	1. choice	✓	✓	✓
M		✓	✓	✓	1. choice	✓	✓	✓			
O									1. choice	✓	✓
N	1. choice	✓	✓		✓	✓					
S		✓	✓		✓	1. choice	✓				



Feed rate low

Continuous cutting

Feed rate high

Interrupted cutting



Overview of chip formers for grooving and groove turning radial

	PA	G	IY	P	HG-Y	ZC	N	T	A
P		✓	✓	✓	✓	✓	✓	1. choice	
M		✓	✓	✓	✓	1. choice	✓	✓	
O				✓					1. choice
N	1. choice					✓			
S			✓	✓	✓	✓			



Feed rate low

Continuous cutting

Feed rate high

Interrupted cutting



Overview of chip formers for grooving and groove turning axial

	TNF-P	TNF-M	TNF-GN	GRIP-A	GRIP-Y	GRIP-T	HFPL/R
P	1. choice	✓	✓		✓	✓	✓
M	✓	1. choice	✓		✓	✓	✓
O					✓	✓	1. choice
N			✓	1. choice	✓	✓	✓
S	✓	✓	✓		1. choice	✓	✓



Feed rate low

Continuous cutting

Feed rate high

Interrupted cutting





Garant Eco parting-off tools for single-sided GARANT parting-off inserts

With Eco cooling directly on the cutting edge and additional flank face cooling.
27 3564 – With coolant transfer for toolholders from other manufacturers (e.g. EWS).

Suitable for:

Size 19/2,2; 19/3,1 – Toolholder No. 274093 or 319132 – 319133 (VDI toolholder).

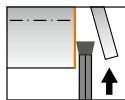
Size 26/2,2–32/5,1 – Toolholder No. 273893; 273894; 274095; 274097 or No. 319132 – 319133 (VDI toolholder).

Application: For deep grooves and parting off large diameters.

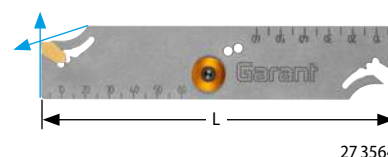
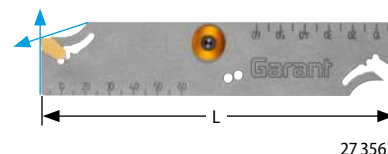
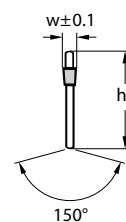
Spare part: Blanking screw No. 279828 size 2.

Sealing disc No. 279830 size 1.

Attention: Please order the assembly key No. 279940 separately.



Blade height h_s / groove width w	21U	27 3562	21U	27 3564	for maximum workpiece $\varnothing$	L	Groove width w
		Eco parting-off tool					
mm					mm	mm	mm
19/2,2		eShop		eShop	40	86	2.2
19/3,1		eShop		eShop	45	86	3.1
26/2,2		eShop		eShop	50	110	2.2
26/3,1		eShop		eShop	75	110	3.1
26/4,1		eShop		eShop	80	110	4.1
32/2,2		eShop		eShop	60	150	2.2
32/3,1		eShop		eShop	100	150	3.1
32/4,1		eShop		eShop	110	150	4.1
32/5,1		eShop		eShop	120	150	5.1

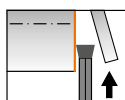


Garant Parting-off tools for single-sided GARANT parting-off inserts

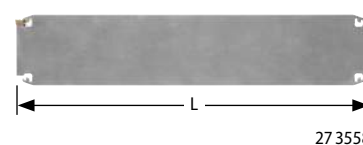
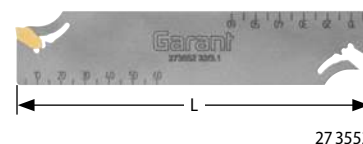
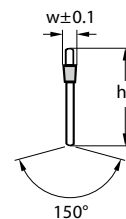
27 3558 – From blade height 100 mm with four insert seats.

Suitable for: Toolholder No. 273984 – 274000 or No. 319132; 319133 (VDI toolholder).

Attention: Please order the assembly key No. 279940 separately.



Blade height h_s / groove width w	21W	27 3552	21U	27 3556	21U	27 3558	for maximum workpiece $\varnothing$	L	Groove width w
		Parting-off tool							
mm		Steel	HSS	Heavy Duty			mm	mm	mm
19/1,5		eShop	eShop	–			32	86	1.5
19/2,2		eShop	eShop	–			40	86	2.2
19/3,1		eShop	eShop	–			45	86	3.1
26/2,2		eShop	eShop	–			50	110	2.2
26/3,1		eShop	eShop	–			75	110	3.1
26/4,1		eShop	eShop	–			80	110	4.1
26/5,1		eShop	–	–			100	110	5.1
32/2,2		eShop	eShop	–			60	150	2.2
32/3,1		eShop	eShop	–			100	150	3.1
32/4,1		eShop	eShop	–			110	150	4.1
32/5,1		eShop	eShop	–			120	150	5.1
45/3,1		–	–	eShop			150	225	3.1
45/4,1		–	–	eShop			160	225	4.1
45/5,1		–	–	eShop			170	225	5.1
45/6,0		–	–	eShop			180	225	6
60/3,1		–	–	eShop			180	230	3.1
60/4,1		–	–	eShop			190	230	4.1
60/5,1		–	–	eShop			200	230	5.1
60/6,0		–	–	eShop			210	230	6
60/8,0		–	–	eShop			220	230	8
100/5,1		–	–	eShop			300	500	5.1
100/6,0		–	–	eShop			400	500	6
100/8,0		–	–	eShop			500	500	8
100/8,0L		–	–	eShop			1000	760	8



Garant Assembly key for grooving tools

Suitable for: GARANT grooving tools with self-locking.

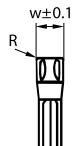
Type		1-3
28U	27 9940	Assembly key
	for groove width w	mm
		1.5 – 8



27 9940_1-3

Garant Parting-off inserts for parting-off tools no. 273552 – 273558 and 273562 – 273564

Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
HB9035				200	180	160	140	110							80				●	●	●	●	
HB9140				120	110	100	90	70				120	80						●	○		●	
HU9215				110	100	80	70								100				●	○		●	
HU9310	380	360	280																●	○		●	
HU7310	300	300	230																●	○		●	○



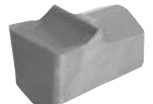
Neutral



27 3500

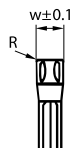


27 3505

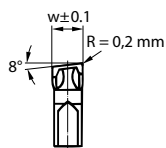


27 3296

Groove width w	mm	1,5	2	3	4	5	6	8		
21J 27 3500	HB9035	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	P
21J 27 3505	Parting-off insert neutral	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	M
21H 27 3296	HU9215	–	–	–	–	–	eShop	eShop	10	K
Corner radius	mm	0.15	0.25	0.25	0.25	0.25	0.3	0.8		
Feed f in steel < 900 N/mm ²	mm/rev.	0.04	0.08	0.1	0.12	0.15	0.17	0.19		



Neutral



Right-hand



27 3310

Groove width w	mm	1,5	2,2	3,1	6	8		
21J 27 3298	Parting-off insert neutral	eShop	–	–	eShop	eShop	10	N
21J 27 3310	Parting-off insert neutral	–	eShop	eShop	–	–	10	N
21J 27 3180	Parting-off insert right-hand	–	eShop	eShop	–	–	10	N
Corner radius	mm	0.15	0.2	0.2	0.3	0.8		
f	mm/rev.	0.04	0.07	0.1	0.17	0.19		

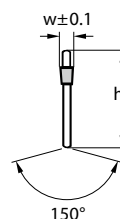
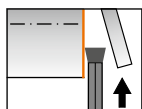
HSS

Garant Parting-off tool for parting-off inserts No. 218460 – 218470

Suitable for: Toolholder No. 273984 – 273994 or No. 319132; 319133 (VDI toolholder).

Attention: Please order the assembly key No. 279940 separately.

For carbide
inserts
see page 668



Blade height h_s / groove width w	mm	19/2,2	19/3,1	26/2,2	26/3,1	32/2,2	32/3,1
21U 27 3560	HSS parting-off tool	neutral	eShop	eShop	eShop	eShop	eShop
for maximum workpiece $\varnothing$	mm	40	40	50	75	50	100
L	mm	86	86	110	110	150	150
t_{max}	mm	21	21	25	37.5	25	50



27



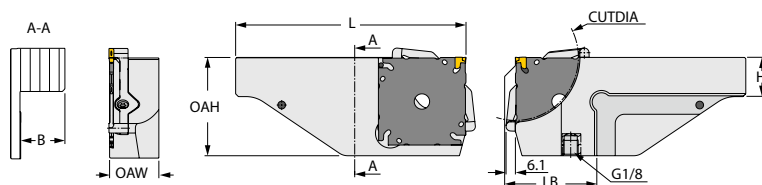
JETCROWN tool blocks

JETCROWN tool block



Application: For parting off and grooving with targeted cooling via JETCROWN quick-clamping crown.

Note: Can only be used in conjunction with suitable JETCROWN quick-clamping crown No. 279950. Coolant transfer to the tool block is only possible via the G 1/8 inch hose coupling.



Shank size		mm	20	25
26D 27 3606	JETCROWN tool block	right-hand	—	—
26D 27 3607		left-hand	—	—
26D 27 3608		right-hand	—	—
26D 27 3609		left-hand	—	—
CUTDIA (27 3606, 27 3607)		mm	65	
CUTDIA (27 3608, 27 3609)		mm	82	
OAH (27 3606, 27 3607)		mm	55	
OAH (27 3608, 27 3609)		mm	64	
LB (27 3606, 27 3607)		mm	42	
LB (27 3608, 27 3609)		mm	53	

JETCROWN quick-clamping crown

Suitable for:

Size 65-2; 65-3 – JETCROWN tool blocks No. 273606 and 273607.

Size 82-3; 82-4 – JETCROWN tool blocks No. 273608 and 273609.

Application: For holding TANGFGRIP adapter No. 273612 – 273613 (order a separate crown for each insert width.)



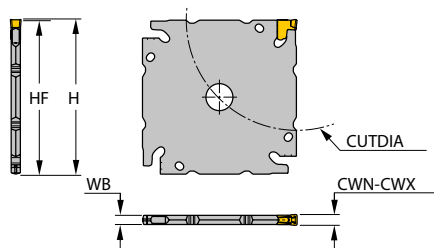
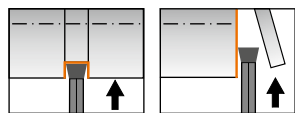
CUTDIA groove width	26D 27 9950
mm	JETCROWN quick-clamping crown
65-2	—
65-3	—
82-3	—
82-4	—



TANGFGRIP adapter

Suitable for: JETCROWN quick-clamping crown No. 279950.

Attention: Please order the assembly key No. 279955 separately.



27 3612

Groove width w	mm	2	3,05	4	Suitable for:
26D 27 3612	TANGFGRIP adapter	neutral	—	—	JET-CROWN
26D 27 3613		neutral	—	—	JET-CROWN
CUTDIA (27 3612)	mm	65	65	—	
CUTDIA (27 3613)	mm	—	82	82	

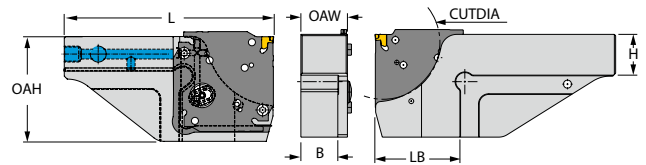


LOGIQFGRIP tool blocks

Suitable for: TANGFGRIP adapter No. 273610, 273611 and 273614.

Application: For parting off and grooving.

Note: Coolant transfer to tool block via G 1/8 inch hose coupling or directly via suitable ISCAR toolholders.



Shank size	mm	16	20	25
26D 27 3600	right-hand	—	—	—
26D 27 3601	left-hand	—	—	—
26D 27 3602	right-hand	—	—	—
26D 27 3603	left-hand	—	—	—
26D 27 3604	right-hand	—	—	—
26D 27 3605	left-hand	—	—	—
CUTDIA (27 3600, 27 3601)	mm	—	42	—
CUTDIA (27 3602, 27 3603)	mm	—	52	52
CUTDIA (27 3604, 27 3605)	mm	—	—	120
OAH (27 3600, 27 3601)	mm	—	40	—
OAH (27 3602, 27 3603)	mm	—	50	50
OAH (27 3604, 27 3605)	mm	—	—	95
LB (27 3600, 27 3601)	mm	—	35	—
LB (27 3602, 27 3603)	mm	—	42	40
LB (27 3604, 27 3605)	mm	—	—	73

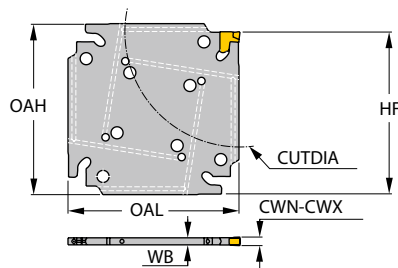
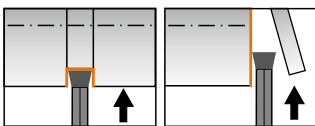


TANGFGRIP adapter

27 3610 – Without through-coolant feed.

Suitable for: Tool blocks No. 273600 – 273605.

Attention: Please order the assembly key No. 279955 separately.



27 3614_3,05

Groove width w	mm	2	3,05	4	Suitable for:
26D 27 3610	neutral	—	—	—	LOGIPFGRIP
26D 27 3611	neutral	—	—	—	LOGIPFGRIP
26D 27 3614	neutral	—	—	—	LOGIPFGRIP
CUTDIA (27 3610)	mm	42	42	—	
CUTDIA (27 3611)	mm	—	52	—	
CUTDIA (27 3614)	mm	—	120	120	



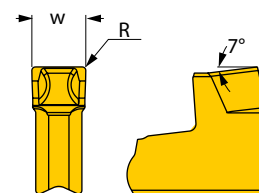
27

TANGGRIP inserts for parting off and grooving

Suitable for: Adapter No. 273610 – 273614.

Application: For parting off and grooving.

Note: The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



Chip breaker C

Chip breakers with a pronounced protective chamfer. First choice for ISO-P.
Medium to high feed rates.



Groove width w / corner radius R	26A 27 3626	26A 27 3628	26A 27 3630		Tolerance groove width w	f
	TANGGRIP TAG N-C inserts					
mm	IC1010	IC1030	IC5400		mm	mm/rev.
2/0,2	—	—	—	10	0.04	0.1 – 0.16
3,05/0,2	—	—	—	10	0.04	0.1 – 0.25
4/0,24	—	—	—	10	0.04	0.1 – 0.3
●	P	P	P			
⊗	⊗	⊗	⊗			
Chip breaker	C	C	C			
v _c main application m/min	60 – 180	60 – 180	60 – 180			

Chip breaker MF

Chip breaker with protective chamfer. Universal for ISO-P and ISO-M.
For medium feed rates.



Groove width w / corner radius R	26A 27 3632	26A 27 3634	26A 27 3636		Tolerance groove width w	f
	TANGGRIP TAG N-MF inserts					
mm	IC1010	IC1030	IC5400		mm	mm/rev.
2/0,2	—	—	—	10	0.05	0.04 – 0.12
3,05/0,2	—	—	—	10	0.05	0.06 – 0.18
4/0,25	—	—	—	10	0.05	0.07 – 0.22
●	P	P	P			
○	M	M	M			
⊗	⊗	⊗	⊗			
Chip breaker	MF	MF	MF			
v _c main application m/min	60 – 180	60 – 180	60 – 180			

Chip breaker LF

Positive chip breaker. Soft-cutting.
Low feed rates.

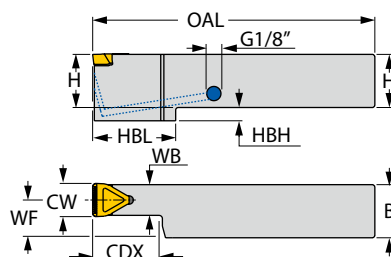


Groove width w / corner radius R	26A 27 3638	26A 27 3640	26A 27 3642		Tolerance groove width w	f
	TANGGRIP TAG N-LF inserts					
mm	IC1010	IC1030	IC5400		mm	mm/rev.
2/0,2	—	—	—	10	0.04	0.03 – 0.08
3,05/0,2	—	—	—	10	0.04	0.04 – 0.1
●	P	P	P			
○	M	M	M			
⊗	⊗	⊗	⊗			
Chip breaker	LF	LF	LF			
v _c main application m/min	60 – 180	60 – 180	60 – 180			



DOVEIQGRIP toolholder

For external groove machining.



27 4140_25

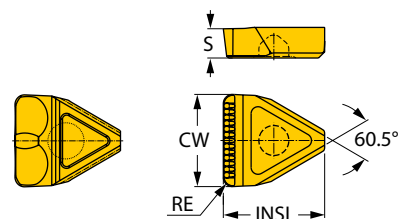
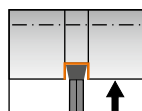
Shank size / groove width w	26D	27 4140	26D	27 4141	HBH	HBL	CDX	WF	OAL	WB
	DOVEIQGRIP THD toolholder									
	right-hand	left-hand	mm	mm						
mm					mm	mm	mm	mm	mm	mm
25/10	—	—			8	30	20	20.4	170	9.2
25/12	—	—			8	30	20	19.5	170	11
25/14	—	—			8	30	20	18.5	170	13
32/16	—	—			8	48	40	24.6	170	14.8
40/16	—	—			—	—	50	32.6	180	14.8



DOVEIQGRIP inserts

Y chip breaker for general groove machining. Positive chip former. Soft cut.

Application: For external grooving for high metal removal rates.



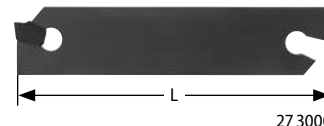
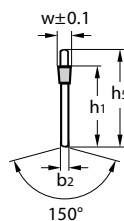
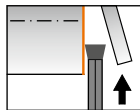
Groove width w	26H	27 4148	26H	27 4149		Corner radius R	CWTOL	fg	RETOL	INSL
	DOVEIQGRIP TIGER-IQ inserts									
mm	IC808	IC830			mm	mm	mm/rev.	mm	mm	
10	—	—	10		0.8	0.08	0.2 – 0.35	0.05	13.3	
12	—	—	10		1.2	0.08	0.2 – 0.4	0.05	14	
14	—	—	10		1.5	0.08	0.22 – 0.45	0.05	161	
16	—	—	10		1.5	0.08	0.22 – 0.5	0.05	20	
	UNI	UNI								
	ZC	ZC								
Chip breaker										
v _c main application	m/min	80 – 180	80 – 180							

HOLEX Parting-off tools for parting-off inserts No. 273010

Suitable for: Toolholder No. 273896 – 273898 or No. 319132; 319133 (VDI toolholder).

Application: Only in conjunction with parting-off inserts No. 273010.

Supplied with: Including key for changing inserts.

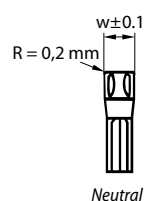


Blade height h_5 / groove width w	mm	19/2,2	19/3,1	26/2,2	26/3,1	32/2,2	32/3,1
22B 27 3000 Steel parting-off tool	neutral	eShop	eShop	eShop	eShop	eShop	eShop
for maximum workpiece $\varnothing$	mm	40	40	75	75	100	100
Width b_2	mm	1.6	2.4	1.6	2.4	1.6	2.4
Height h_1	mm	15.5	15.4	21.2	21.1	24.8	24.7
L	mm	86	86	110	110	150	150

HOLEX Parting-off inserts for parting-off tools No. 273000

Application: Only in conjunction with parting-off tool No. 273000.

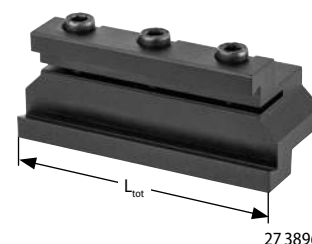
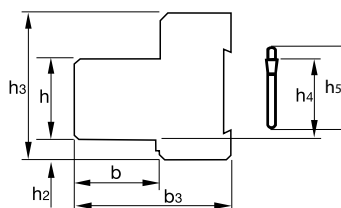
Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N						
27 3010				120	100	90	80					80	60		80								



Groove width w	mm	2,2	3,1	
22D 27 3010 Parting-off insert	HBX25	eShop	eShop	10
Feed f in steel < 900 N/mm ²	mm/rev.	0.07	0.1	

HOLEX Toolholders for parting-off tools No. 273000

Application: In conjunction with parting-off tool No. 273000. Can also be used for many standard parting-off tools from other manufacturers.



Shank height h	mm	16	20	25	For blade height h_5	Clamping screw
22B 27 3896		eShop	—	—	19	279816 8
22B 27 3897	Toolholder for parting-off tools	—	eShop	eShop	26	279816 8
22B 27 3898		—	eShop	eShop	32	279816 8
h_4	mm	16	20	25		
h_2 (27 3896, 27 3897)	mm	4	8	8		
h_2 (27 3898)	mm	—	13	8		
h_3 (27 3896, 27 3897)	mm	32	38	43		
h_3 (27 3898)	mm	—	48	48		
b	mm		20			
b_3	mm		36			
L_{tot} (27 3896, 27 3897)	mm	80	90	100		
L_{tot} (27 3898)	mm	—	100	100		



Garant Parting-off tool for parting-off inserts No. 273656 – 273749

Suitable for: Toolholder No. 273984 – 273994 or 319132 – 319133 (VDI toolholder).

Application: In conjunction with parting-off inserts No. 273656 – 273749.

Attention: Please order the assembly key No. 279940 separately.

Note: From 19.5 mm groove depth (up to groove width 3 mm) and from 24.5 mm groove depth (from groove width 4 mm) the second cutter comes into contact with the workpiece. This can lead to scoring. If necessary, use single-ended grooving inserts No. 273656 – 273670.



27 3781

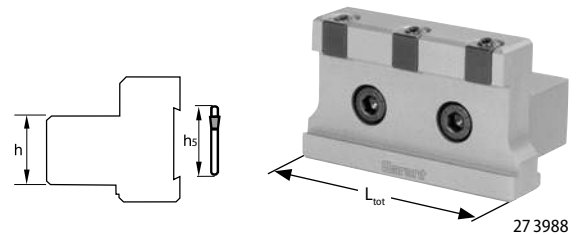
Blade height h_s / groove width w		mm	19/1,5	19/2	19/3	26/2	26/3	32/2	32/3	32/4	32/5	32/6
2W	27 3781	Parting-off tool	neutral	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
for maximum workpiece Ø		mm	40	40	40	60	85	60	110	110	110	110
L		mm	96	96	96	120	120	150	150	150	150	150

Garant Toolholder for parting-off tools, with removable shank

27 3986/3990 – Long version for high stability.

Application: Allows grooving tools of different makes to be used.
Can be used even on toolholders with concealed clamping elements.

Additional dimensional data
can be found in our eShop at
<https://www.hoffmann-group.com>



27 3988

Shank height h		mm	12	16	20	25	For blade height h_s mm	Clamp	Clamping screw
2W	27 3984	Parting-off toolholder with removable shank	eShop	eShop	–	–	19	279840 2	279815 14
2W	27 3986		–	–	eShop	eShop	26	279840 2	279815 14
2W	27 3988		–	–	eShop	eShop	26	279840 2	279815 14
2W	27 3990		–	–	eShop	eShop	32	279840 2	279815 14
2W	27 3992		–	–	eShop	eShop	32	279840 2	279815 14
L_{tot} (27 3984, 27 3986, 27 3990)		mm	61	61	110	110			
L_{tot} (27 3988, 27 3992)		mm	–	–	90	90			

Garant Assembly key for fitting inserts

It is simple to change the inserts – precisely and in seconds.

With just a single turn of the GARANT assembly key, you can position the insert exactly where you want it.
Many potential applications for GARANT grooving tools.

One key – one system!

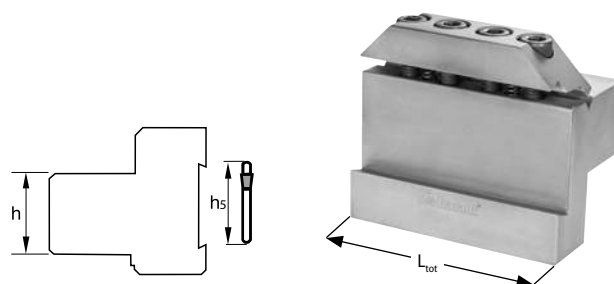
- GARANT parting-off blade.
- GARANT tool holder for radial grooving.
- GARANT tool holder for face grooving.
- GARANT boring bar for grooving (No. 27 4170 – 27 4171).



Garant Toolholder with removable clamping strip

Higher clamping forces due to larger clamping screws in the clamping strip.

Application: Allows grooving tools of different makes to be used.
Can be used even on toolholders with concealed clamping elements.



Shank height h	mm	10	12	16	20	25	32	40	50	For blade height h _s mm	Clamping strip	Clamping screw
21U 27 3991	Toolholder with removable clamping strip	eShop	eShop	eShop	—	—	—	—	—	19	279928 4	279815 22
21U 27 3993		—	—	eShop	eShop	eShop	—	—	—	26	279928 1	279815 17
21U 27 3994		—	—	—	eShop	eShop	eShop	—	—	32	279928 2	279815 17
21U 27 3996		—	—	—	eShop	eShop	eShop	eShop	—	45	279928 3	279815 18
21U 27 3998		—	—	—	—	eShop	eShop	eShop	eShop	60	279928 3	279815 18
21U 27 4000		—	—	—	—	—	—	eShop	eShop	100	279928 3	279815 18
L _{tot} (27 3991, 27 3994, 27 4000)	mm	76	76	76	100	100	100	250	250			
L _{tot} (27 3993)	mm	—	—	87	87	87	—	—	—			
L _{tot} (27 3996, 27 3998)	mm	—	—	—	120	120	120	120	120			



Garant Eco grooving tools, strengthened

With Eco cooling directly on the cutting edge and additional flank face cooling.

27 3854/3855 – With coolant transfer for toolholders from other manufacturers.

Suitable for:

27 3864 – Toolholder No. 273893; 273894; 274095; 274097 or VDI toolholder 319133.

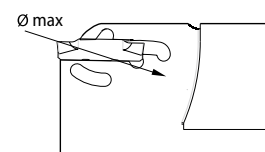
27 3865 – Toolholder No. 273893; 273894; 274095; 274097 or VDI toolholder 319132.

27 3864 Size 26/3; 26/3L – 319140 – 319141 size RR or LR.

27 3865 Size 26/3; 26/3L – 319140 – 319141 size RL or LL.

Attention: Please order the assembly key No. 279920 separately.

Note: Due to its design, it is not compatible with EWS toolholders No. 319148 and 319149.



Blade height h _s / groove width w	mm	26/3	26/3L	32/3	32/3L
21W 27 3864	Eco grooving tool strengthened	right-hand	eShop	eShop	eShop
21W 27 3865		left-hand	eShop	eShop	eShop
21W 27 3854		right-hand	eShop	eShop	eShop
21W 27 3855		left-hand	eShop	eShop	eShop
for maximum workpiece Ø	mm	65	90	65	90
Height h ₁	mm	21.4	21.4	25	25
L (27 3864, 27 3865)	mm	97	109.5	109.5	122
L (27 3854, 27 3855)	mm	83.5	96	87.5	100

Garant Assembly key

Suitable for: Grooving tools No. 273854 – 273866.

Application: For assembling or disassembling the grooving inserts.



27 9920

29Y 27 9920	Assembly key	eShop
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Garant Eco grooving tools

With Eco cooling directly on the cutting edge and additional flank face cooling.

27 3856 – With coolant transfer for toolholders from other manufacturers (e.g. EWS).

Suitable for:

Size 26/2–32/6 – Toolholder No. 273893; 273894; 274095; 274097 or VDI toolholder No. 319132 – 319133.

Size 19/2; 19/3 – Toolholder No. 274093 or VDI toolholder No. 319132 – 319133.

Application:

For deep grooves and parting off large diameters.

Spare part:

Blanking screw No. 279828 1.

Attention:

Please order the assembly key No. 279920 separately.

Note:

From 19.5 mm groove depth (up to groove width 3 mm) and from 24.5 mm groove depth (from groove width 4 mm) the second cutter comes into contact with the workpiece. This can lead to scoring. If necessary, use single-ended grooving inserts No. 273656 – 273670.

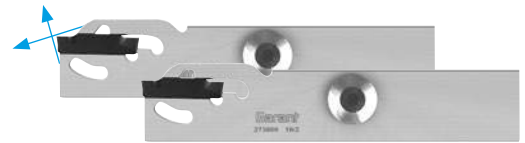
Size 19/2; 19/3 – Set consisting of 2 blades each with its own seating.



27 3866



27 3856



27 3866_19/2 – 19/3

Blade height h_s / groove width w	mm	19/2	19/3	26/2	26/3	32/2	32/3	32/4	32/5	32/6
27 3866	neutral	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
27 3856	neutral	–	–	eShop	eShop	eShop	eShop	eShop	eShop	eShop
for maximum workpiece $\varnothing$	mm	40	40	60	85	60	110	110	110	110
Height h_1	mm	15.7	15.7	21.4	21.4	25	25	25	25	25
L	mm	96	96	120	120	150	150	150	150	150

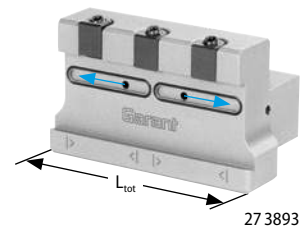


Garant Eco toolholder for Eco grooving tool and Eco grooving tool strengthened

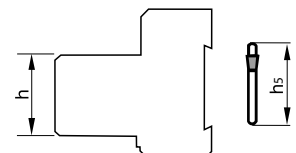
Note:

Coolant transfer only possible in conjunction with GARANT Master Eco toolholders No. 319006 – 319136.

Shank height h		mm	20	25	For blade height h _s mm	Clamp	Clamping screw
ZW	27 3893	Eco toolholder	eShop	eShop	26	279840 2	279815 14
ZW	27 3894		eShop	eShop	32	279840 2	279815 14
L _{tot}		mm	78	90			



27 3893



Garant Eco toolholder with removable clamping strip

Application:

For use of GARANT Eco grooving tools.

Can be used even on toolholders with concealed clamping elements.

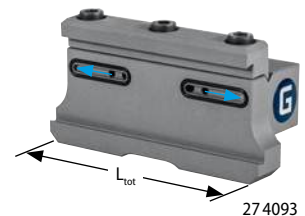
Spare part:

27 4093 – Grub screw No. 279832 1.

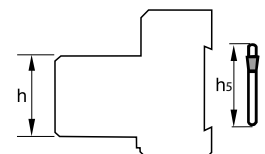
27 4095/4097 – Grub screw No. 279832 2.

Note:

Coolant transfer only possible in conjunction with GARANT Master Eco holder No. 319006 – 319136. Optional connection possibility via hose connection with connection set No. 279833 1.



27 4093



Shank height h	mm	10	12	16	20	25	32	For blade height h_s mm	Clamping strip	Clamping screw
27 4093	eShop	eShop	eShop	–	–	–	–	19	279928 4	279815 23
27 4095	–	–	–	eShop	eShop	eShop	–	26	279928 5	279815 22
27 4097	–	–	–	–	eShop	eShop	eShop	32	279928 6	279815 22
L_{tot} (27 4093, 27 4097)	mm	70	70	70	94	94	94			
L_{tot} (27 4095)	mm	–	–	82	82	82	–			

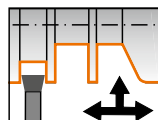


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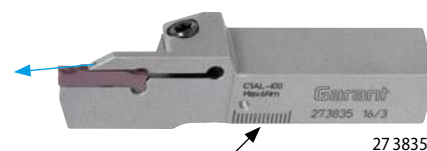
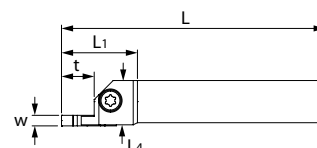
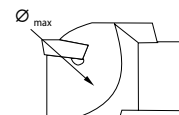
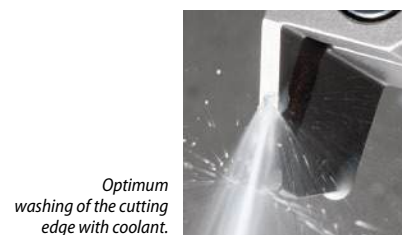
Garant Grooving toolholder with $t_{\max} \leq 12.5 \times \text{groove width } w$

Made of high-tensile tool steel ($> 1300 \text{ N/mm}^2$). In conjunction with the convex insert clamping, the system achieves very high resistance to axial and radial cutting forces and thereby significantly increases the surface quality and productivity.

Note: Maximum $\varnothing$ = limited workpiece $\varnothing$ due to the tool type.
From 19.5 mm groove depth (up to groove width 3 mm) and from 24.5 mm groove depth (from groove width 4 mm) the second cutter comes into contact with the workpiece. This can lead to scoring.
If necessary, use single-cutter grooving inserts No. 273656 – 273670.



Up to groove depth
 $37.5 \text{ mm} = 12.5 \times w$



Positioning within the scale ensures precise coolant transfer.

Eco grooving toolholder with groove depth $t_{\max} \leq 12.5 \times \text{groove width } w$



Size 16/3 – $8 \times w$

Size 20/3; 25/3 – $10 \times w$

Size 20/3L; 25/3L – $12.5 \times w$ (groove depth up to 37.5 mm)

Note: Coolant transfer only possible in conjunction with GARANT Master Eco toolholders No. 319006 – 319136.

Shank width / groove width w	21W 27 3835	21W 27 3836	maximum $\varnothing$	$t_{\max}$	L_4	L_1	L	Screw
	Eco grooving toolholder							
mm	right-hand	left-hand	mm	mm	mm	mm	mm	
16/3	eShop	eShop	50	25	16	43	90	279815 5 (TX25; 6 Nm)
20/3	eShop	eShop	60	30	21.5	49	108	279815 6 (TX25; 6 Nm)
20/3L	eShop	eShop	75	37.5	21.5	54	113	279815 6 (TX25; 6 Nm)
25/3	eShop	eShop	60	30	26.5	49	121	279815 6 (TX25; 6 Nm)
25/3L	eShop	eShop	75	37.5	26.5	54	125.5	279815 6 (TX25; 6 Nm)

Grooving toolholder with groove depth $t_{\max} \leq 12.5 \times \text{groove width } w$

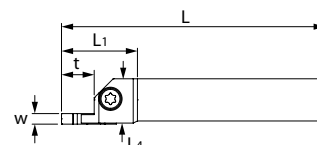
Size 12/3 – $6.5 \times w$

Size 16/4 – $7.5 \times w$

Size 16/3; 20/4; 25/4 – $8 \times w$

Size 20/3; 25/3 – $10 \times w$

Size 20/3L; 25/3L – $12.5 \times w$ (groove depth up to 37.5 mm)



Shank width / groove width w	21W 27 3760	21W 27 3761	maximum $\varnothing$	$t_{\max}$	L_4	L_1	L	Screw
	Grooving toolholder							
mm	right-hand	left-hand	mm	mm	mm	mm	mm	
12/3	eShop	eShop	40	20	12	35	150	279815 4 (TX15; 3.5 Nm)
16/3	eShop	eShop	50	25	16	41	150	279815 5 (TX25; 6 Nm)
20/3	eShop	eShop	60	30	21.5	46	150	279815 6 (TX25; 6 Nm)
20/3L	eShop	eShop	75	37.5	21.5	54	150	279815 6 (TX25; 6 Nm)
25/3	eShop	eShop	60	30	26.5	46	150	279815 6 (TX25; 6 Nm)
25/3L	eShop	eShop	75	37.5	26.5	54	150	279815 6 (TX25; 6 Nm)
16/4	eShop	eShop	60	30	16	48	150	279815 5 (TX25; 6 Nm)
20/4	eShop	eShop	65	32.5	21.5	51	150	279815 6 (TX25; 6 Nm)
25/4	eShop	eShop	65	32.5	26.5	51	150	279815 6 (TX25; 6 Nm)

Garant Grooving toolholder with $t_{\max} = 7 \times \text{groove width } w$

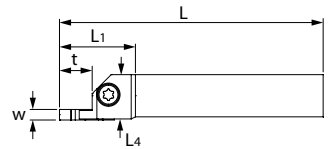
Made of high-tensile tool steel ($> 1300 \text{ N/mm}^2$). In conjunction with the convex insert clamping, the system achieves very high resistance to axial and radial cutting forces and thereby significantly increases the surface quality and productivity.

Note: From 19.5 mm groove depth (up to groove width 3 mm) and from 24.5 mm groove depth (from groove width 4 mm) the second cutter comes into contact with the workpiece. This can lead to scoring. If necessary, use single-ended grooving inserts No. 273656 – 273670.

Eco grooving toolholder with groove depth $t_{\max} = 7 \times \text{groove width } w$

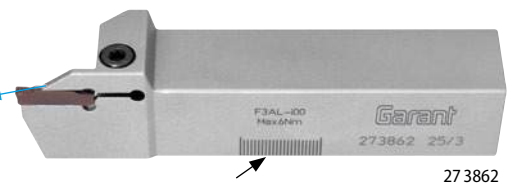


Note: Coolant transfer only possible in conjunction with GARANT Master Eco toolholders No. 319006 – 319136.



Additional overhang:
Shank 16 mm = + 14 mm
Shank 20 mm = + 17 mm
Shank 25 mm = + 22 mm

long shank type

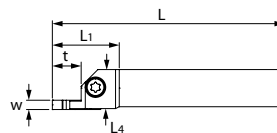


Positioning within the scale ensures precise coolant transfer.

Shank width / groove width w	21W	27 3862	21W	27 3863	$t_{\max}$	L_4	L_1	L	Screw
	Eco grooving toolholder, with long shank								
mm		right-hand		left-hand	mm	mm	mm	mm	
16/3		eShop		eShop	21	16	37	97.5	279815 5 (TX25; 6 Nm)
20/3		eShop		eShop	21	21.5	36.5	112	279815 6 (TX25; 6 Nm)
25/3		eShop		eShop	21	26.5	36.5	130	279815 6 (TX25; 6 Nm)

Shank width / groove width w	21W	27 3860	21W	27 3861	$t_{\max}$	L_4	L_1	L	Screw
	Eco grooving toolholder								
mm		right-hand		left-hand	mm	mm	mm	mm	
16/2		eShop		eShop	14	16	31.5	78.5	279815 5 (TX25; 6 Nm)
20/2		eShop		eShop	14	21.5	33.5	92.5	279815 6 (TX25; 6 Nm)
25/2		eShop		eShop	14	26.5	33.5	105	279815 6 (TX25; 6 Nm)
16/3		eShop		eShop	21	16	37	84	279815 5 (TX25; 6 Nm)
20/3		eShop		eShop	21	21.5	36.5	95.5	279815 6 (TX25; 6 Nm)
25/3		eShop		eShop	21	26.5	36.5	108	279815 6 (TX25; 6 Nm)
16/4		eShop		eShop	28	16	45.5	92.5	279815 5 (TX25; 6 Nm)
20/4		eShop		eShop	28	21.5	48	107	279815 7 (TX30; 8 Nm)
25/4		eShop		eShop	28	26.5	48	119.5	279815 7 (TX30; 8 Nm)

Grooving toolholder with groove depth $t_{\max} = 7 \times \text{groove width } w$



27 3757

Shank width / groove width w	21W	27 3757	21W	27 3758	$t_{\max}$	L_4	L_1	L	Screw
	Grooving toolholder								
mm		right-hand		left-hand	mm	mm	mm	mm	
12/1,5		eShop		eShop	10.5	12	28.5	150	279815 4 (TX15; 3.5 Nm)
16/1,5		eShop		eShop	10.5	16	30	100	279815 4 (TX15; 3.5 Nm)
20/1,5		eShop		eShop	10.5	21.5	30	125	279815 6 (TX25; 6 Nm)
25/1,5		eShop		eShop	10.5	26.5	29	150	279815 6 (TX25; 6 Nm)
12/2		eShop		eShop	14	12	31.5	150	279815 4 (TX15; 3.5 Nm)
16/2		eShop		eShop	14	16	31.5	100	279815 5 (TX25; 6 Nm)
20/2		eShop		eShop	14	21.5	33.5	125	279815 6 (TX25; 6 Nm)
25/2		eShop		eShop	14	26.5	33.5	150	279815 6 (TX25; 6 Nm)
16/3		eShop		eShop	21	16	37	100	279815 5 (TX25; 6 Nm)
20/3		eShop		eShop	21	21.5	36.5	125	279815 6 (TX25; 6 Nm)
25/3		eShop		eShop	21	26.5	36.5	150	279815 6 (TX25; 6 Nm)
32/3		eShop		eShop	21	26.5	36.5	170	279815 6 (TX25; 6 Nm)
20/4		eShop		eShop	28	21.5	48	125	279815 7 (TX30; 8 Nm)
25/4		eShop		eShop	28	26.5	48	150	279815 7 (TX30; 8 Nm)
32/4		eShop		eShop	28	26.5	48	170	279815 7 (TX30; 8 Nm)

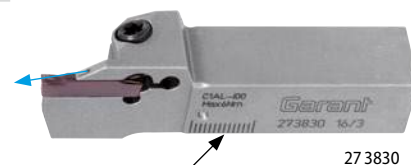


27

Garant Grooving toolholder with $t_{\max} = 5 \times \text{groove width } w$

Made of high-tensile tool steel ($> 1300 \text{ N/mm}^2$). In conjunction with the convex insert clamping, the system achieves very high resistance to axial and radial cutting forces and thereby significantly increases the surface quality and productivity.

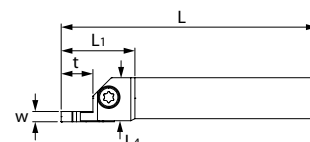
Note: From groove width 6 mm at $t_{\max}$ ($5 \times \text{groove width}$), the second cutter comes into contact with the workpiece. This can lead to scoring. Reliably free of scoring up to $t = 24.5 \text{ mm}$.



Positioning within the scale ensures precise coolant transfer.

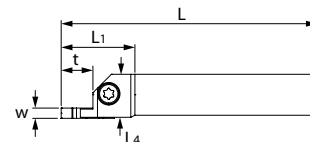


Note: Coolant transfer only possible in conjunction with GARANT Master Eco toolholders No. 319006 – 319136.



Shank width / groove width w	273830	273831	$t_{\max}$	L_4	L_1	L	Screw
	Eco grooving toolholder						
mm	right-hand	left-hand	mm	mm	mm	mm	
16/2	eShop	eShop	10	16	30.5	77.5	279815 5 (TX25; 6 Nm)
20/2	eShop	eShop	10	21.5	33.5	92.5	279815 6 (TX25; 6 Nm)
25/2	eShop	eShop	10	26.5	33.5	105	279815 6 (TX25; 6 Nm)
16/3	eShop	eShop	15	16	31.5	78.5	279815 5 (TX25; 6 Nm)
20/3	eShop	eShop	15	21.5	34.5	93.5	279815 6 (TX25; 6 Nm)
25/3	eShop	eShop	15	26.5	34.5	106	279815 6 (TX25; 6 Nm)
16/4	eShop	eShop	20	16	37.5	84.5	279815 5 (TX25; 6 Nm)
20/4	eShop	eShop	20	21.5	40.5	99.5	279815 7 (TX30; 8 Nm)
25/4	eShop	eShop	20	26.5	40.5	112	279815 7 (TX30; 8 Nm)
20/5	eShop	eShop	25	21.5	40.5	102.5	279815 7 (TX30; 8 Nm)
25/5	eShop	eShop	25	26.5	40.5	115	279815 7 (TX30; 8 Nm)
20/6	eShop	eShop	30	21.5	40.5	109.5	279815 7 (TX30; 8 Nm)
25/6	eShop	eShop	30	26.5	40.5	122	279815 7 (TX30; 8 Nm)

Grooving toolholder with groove depth $t_{\max} = 5 \times \text{groove width } w$



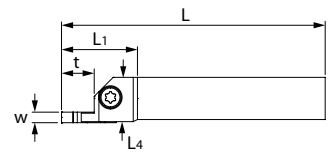
Shank width / groove width w	273755	273756	$t_{\max}$	L_4	L_1	L	Screw
	Grooving toolholder						
mm	right-hand	left-hand	mm	mm	mm	mm	
8/1,5	eShop	eShop	7.5	8	20.5	125	279815 12 (TX15; 3.5 Nm)
10/1,5	eShop	eShop	7.5	10	20.5	120	279815 4 (TX15; 3.5 Nm)
12/1,5	eShop	eShop	7.5	12	26	150	279815 4 (TX15; 3.5 Nm)
16/1,5	eShop	eShop	7.5	16	29	100	279815 4 (TX15; 3.5 Nm)
20/1,5	eShop	eShop	7.5	21.5	29.5	125	279815 6 (TX25; 6 Nm)
25/1,5	eShop	eShop	7.5	26.5	29	150	279815 6 (TX25; 6 Nm)
10/2	eShop	eShop	10	10	26	120	279815 4 (TX15; 3.5 Nm)
12/2	eShop	eShop	10	12	30	150	279815 4 (TX15; 3.5 Nm)
16/2	eShop	eShop	10	16	30	100	279815 5 (TX25; 6 Nm)
20/2	eShop	eShop	10	21.5	33	125	279815 6 (TX25; 6 Nm)
25/2	eShop	eShop	10	26.5	33	150	279815 6 (TX25; 6 Nm)
12/2,5	eShop	eShop	12.5	12	31	150	279815 4 (TX15; 3.5 Nm)
16/2,5	eShop	eShop	12.5	16	31	100	279815 5 (TX25; 6 Nm)
20/2,5	eShop	eShop	12.5	21.5	33	125	279815 6 (TX25; 6 Nm)
25/2,5	eShop	eShop	12.5	26.5	33	150	279815 6 (TX25; 6 Nm)
12/3	eShop	eShop	15	12	30	150	279815 4 (TX15; 3.5 Nm)
16/3	eShop	eShop	15	16	31	100	279815 5 (TX25; 6 Nm)
20/3	eShop	eShop	15	21.5	34	125	279815 6 (TX25; 6 Nm)
25/3	eShop	eShop	15	26.5	34	150	279815 6 (TX25; 6 Nm)
32/3	eShop	eShop	15	26.5	34	170	279815 6 (TX25; 6 Nm)
16/4	eShop	eShop	20	16	37	100	279815 5 (TX25; 6 Nm)
20/4	eShop	eShop	20	21.5	40	125	279815 7 (TX30; 8 Nm)
25/4	eShop	eShop	20	26.5	40	150	279815 7 (TX30; 8 Nm)
32/4	eShop	eShop	20	26.5	40	170	279815 7 (TX30; 8 Nm)
20/5	eShop	eShop	25	21.5	43	125	279815 7 (TX30; 8 Nm)
25/5	eShop	eShop	25	26.5	43	150	279815 7 (TX30; 8 Nm)
32/5	eShop	eShop	25	26.5	43	170	279815 7 (TX30; 8 Nm)
20/6	eShop	eShop	30	21.5	49	125	279815 7 (TX30; 8 Nm)
25/6	eShop	eShop	30	26.5	50	150	279815 7 (TX30; 8 Nm)
32/6	eShop	eShop	30	26.5	50	170	279815 7 (TX30; 8 Nm)

Garant Grooving toolholder with $t_{\max} = 3 \times \text{groove width } w$

Made of high-tensile tool steel ($> 1300 \text{ N/mm}^2$). In conjunction with the convex insert clamping, the system achieves very high resistance to axial and radial cutting forces and thereby significantly increases the surface quality and productivity.



27 3750

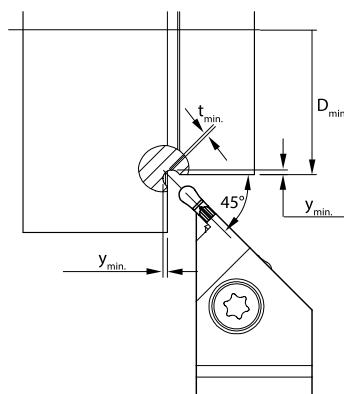


Shank / groove width w	27 3750	27 3751	$t_{\max}$	L_4	L_1	L	Screw
	Grooving toolholder						
mm	right-hand	left-hand	mm	mm	mm	mm	
8/1,5	eShop	eShop	4.5	8	20.5	125	279815 12 (TX15; 3.5 Nm)
10/1,5	eShop	eShop	4.5	10	20.5	120	279815 4 (TX15; 3.5 Nm)
12/1,5	eShop	eShop	4.5	12	26	150	279815 4 (TX15; 3.5 Nm)
16/1,5	eShop	eShop	4.5	16	26	100	279815 4 (TX15; 3.5 Nm)
20/1,5	eShop	eShop	4.5	21.5	29	125	279815 6 (TX25; 6 Nm)
25/1,5	eShop	eShop	4.5	26.5	29	150	279815 6 (TX25; 6 Nm)
10/2	eShop	eShop	6	10	26	120	279815 4 (TX15; 3.5 Nm)
12/2	eShop	eShop	6	12	30	150	279815 4 (TX15; 3.5 Nm)
16/2	eShop	eShop	6	16	30	100	279815 5 (TX25; 6 Nm)
20/2	eShop	eShop	6	21.5	33	125	279815 6 (TX25; 6 Nm)
25/2	eShop	eShop	6	26.5	33	150	279815 6 (TX25; 6 Nm)
12/3	eShop	eShop	9	12	30	150	279815 4 (TX15; 3.5 Nm)
16/3	eShop	eShop	9	16	30	100	279815 5 (TX25; 6 Nm)
20/3	eShop	eShop	9	21.5	33	125	279815 6 (TX25; 6 Nm)
25/3	eShop	eShop	9	26.5	33	150	279815 6 (TX25; 6 Nm)
32/3	eShop	eShop	9	26.5	33	170	279815 6 (TX25; 6 Nm)
12/4	eShop	eShop	12	12	35	150	279815 4 (TX15; 3.5 Nm)
16/4	eShop	eShop	12	16	35	100	279815 5 (TX25; 6 Nm)
20/4	eShop	eShop	12	21.5	37	125	279815 7 (TX30; 8 Nm)
25/4	eShop	eShop	12	26.5	37	150	279815 7 (TX30; 8 Nm)
32/4	eShop	eShop	12	26.5	37	170	279815 7 (TX30; 8 Nm)
20/5	eShop	eShop	15	21.5	38	125	279815 7 (TX30; 8 Nm)
25/5	eShop	eShop	15	26.5	38	150	279815 7 (TX30; 8 Nm)
32/5	eShop	eShop	15	26.5	38	170	279815 7 (TX30; 8 Nm)
20/6	eShop	eShop	18	21.5	40	125	279815 7 (TX30; 8 Nm)
25/6	eShop	eShop	18	26.5	39	150	279815 7 (TX30; 8 Nm)
32/6	eShop	eShop	18	26.5	39	170	279815 7 (TX30; 8 Nm)

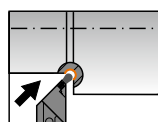
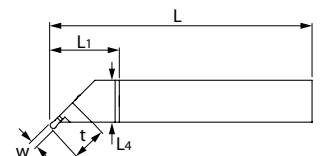
Garant Grooving toolholder 45°

Application: For free turning operations directly up to a shoulder, to create free undercuts for threading and grinding work.

- Note:**
- $\varnothing D_{\min} = 30 \text{ mm}$ (at $w = 3$).
 - $\varnothing D_{\min} = 35 \text{ mm}$ (at $w = 2$).
 - Use only with a full radius groove turning insert No. 273735 – 273739.
 - No standardised undercut according to DIN 509.



27 3762



Shank / groove width w	27 3762	27 3763	$t_{\min}$	$y_{\min}$	L_4	L_1	L	Screw
	Grooving toolholder 45°							
	right-hand	left-hand	mm	mm	mm	mm	mm	
20/2	eShop	eShop	0.5	0.35	23	33	125	279815 6 (TX25; 6 Nm)
25/2	eShop	eShop	0.5	0.35	28	33	150	279815 6 (TX25; 6 Nm)
20/3	eShop	eShop	0.7	0.5	23	33	125	279815 6 (TX25; 6 Nm)
25/3	eShop	eShop	0.7	0.5	28	33	150	279815 6 (TX25; 6 Nm)



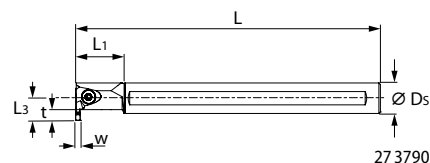
Garant Boring bar for grooving

Note:

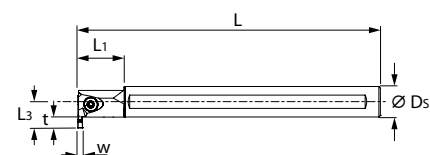
Size 20/3L – Insertion $\varnothing D_{\min} = 25$ mm up to a length of 30.5 mm.
Insertion $\varnothing D_{\min} = 27.5$ mm on the entire length.



27 3790



27 3790



27 3790_20/3L

Shank $\varnothing D_s$ / groove width w	27 3790	27 3791	$t_{\max}$ internal machining	$\varnothing D_{\min}$	L_3	L_1	L	Screw
	Boring bar for grooving							
mm	right-hand	left-hand	mm	mm	mm	mm	mm	
12/1,5	eShop	eShop	4.5	16	9.5	30	140	279815 12 (TX15; 3.5 Nm)
16/1,5	eShop	eShop	4.5	16	7.5	30	180	279815 12 (TX15; 3.5 Nm)
16/1,5X	eShop	eShop	6	19	10.5	30	180	279815 12 (TX15; 3.5 Nm)
20/1,5	eShop	eShop	6	25	14.5	30	180	279815 8 (TX20; 4.5 Nm)
16/2	eShop	eShop	6	23	14.5	30	180	279815 9 (TX25; 4.5 Nm)
20/2	eShop	eShop	6	25	14.5	30	200	279815 8 (TX20; 4.5 Nm)
25/2	eShop	eShop	6	32	19	40	250	279815 8 (TX20; 4.5 Nm)
32/2	eShop	eShop	10	39	22	50	300	279815 8 (TX20; 4.5 Nm)
40/2	eShop	eShop	11.5	49	27	60	350	279815 8 (TX20; 4.5 Nm)
20/2,5	eShop	eShop	6	25	14.5	30	200	279815 8 (TX20; 4.5 Nm)
25/2,5	eShop	eShop	6	32	19	40	250	279815 8 (TX20; 4.5 Nm)
16/3	eShop	eShop	6	23	14.5	30	180	279815 9 (TX25; 4.5 Nm)
20/3	eShop	eShop	6	25	14.5	30	200	279815 8 (TX20; 4.5 Nm)
20/3L	eShop	eShop	6	27.5	17	—	200	279815 8 (TX20; 4.5 Nm)
25/3	eShop	eShop	6	32	19	40	250	279815 8 (TX20; 4.5 Nm)
32/3	eShop	eShop	9.5	40	22	50	300	279815 8 (TX20; 4.5 Nm)
40/3	eShop	eShop	11.5	49	27	60	350	279815 8 (TX20; 4.5 Nm)
25/4	eShop	eShop	9.5	32	19	40	250	279815 8 (TX20; 4.5 Nm)
32/4	eShop	eShop	11.5	40	22	50	300	279815 8 (TX20; 4.5 Nm)
40/4	eShop	eShop	13	49	27	60	350	279815 8 (TX20; 4.5 Nm)
25/5	eShop	eShop	9.5	32	19	40	250	279815 8 (TX20; 4.5 Nm)
32/5	eShop	eShop	11.5	40	22	50	300	279815 8 (TX20; 4.5 Nm)
40/5	eShop	eShop	13	49	27	60	350	279815 8 (TX20; 4.5 Nm)
25/6	eShop	eShop	9.5	32	19	40	250	279815 8 (TX20; 4.5 Nm)
32/6	eShop	eShop	11.5	40	22	50	300	279815 8 (TX20; 4.5 Nm)
40/6	eShop	eShop	13	49	27	60	350	279815 8 (TX20; 4.5 Nm)

Garant GARANT Vario plus

Innovative grooving system – variable, diverse and precise – always the ideal solution!
Find the comprehensive catalogue range on pages 891 – 893.



27 4500_25



27 4531_HSK63



27 4510_4



27 4516_67/100

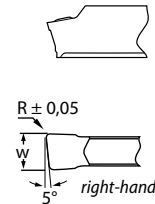


27 4541_3

Garant Parting-off and grooving inserts

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	M	M	S	K	N	N					
HB7310 / HU7310				220	180	170	140	120					140	130	60	200	250		●	●	○	●	○
CBN825	350	350	280										150	140	50	200	250		●	●	○	●	○
PKD				230	190	180	150	130							70	200	250		●	●	○	●	○
HB7010				210	170	140													●	●	○	●	○
HB7020				300	250	210										280			●	●	○	●	○
CU7025										100	100	100							●	●	○	●	○
HB7215	650	650	650													550	400		●	●	○	●	○

Single-ended parting-off / grooving inserts



27 3668

Groove width w			mm	2	3	4				Corner radius R mm
21J 27 3656	Parting-off insert right-hand 5°	HB7020	eShop	—	—	10	P	M	0.2	
21J 27 3657	Parting-off insert left-hand 5°	HB7020	eShop	—	—	10	P	M	0.2	
21J 27 3658	Parting-off insert right-hand 5°	HB7020	—	eShop	—	10	P	M	0.3	
21J 27 3659	Parting-off insert left-hand 5°	HB7020	—	eShop	—	10	P	M	0.3	
21J 27 3668	Parting-off / grooving in- sert	HB7020	eShop	—	—	10	P	M	0.2	
21L 27 3664		HU7310	eShop	eShop	eShop	10	N	Ti	0.2	
21J 27 3670		HB7020	—	eShop	eShop	10	P	M	0.3	
Tolerance groove width w		mm	±0.03	±0.03	±0.04					
f		mm/rev.	0.05 – 0.15	0.07 – 0.2	0.08 – 0.26					

Double-ended parting-off / grooving inserts



27 3690



27 3697



27 3704

Groove width w			mm	1,5	2	2,5	3	4	5	6				Corner radius R mm
21L 27 3678	Parting-off insert right-hand 10°	HU7310	—	eShop	eShop	eShop	eShop	—	—	10	N	Ti	0.05	
21L 27 3680	Parting-off insert left-hand 10°	HU7310	—	eShop	eShop	eShop	eShop	—	—	10	N	Ti	0.05	
21J 27 3682	Parting-off insert right-hand 5°	HB7020	—	eShop	—	—	—	—	—	10	P	M	0.2	
21J 27 3686	Parting-off insert left-hand 5°	HB7020	—	eShop	—	—	—	—	—	10	P	M	0.2	
21J 27 3690	Parting-off insert right-hand 5°	HB7020	—	—	—	eShop	eShop	—	—	10	P	M	0.3	
21J 27 3694	Parting-off insert left-hand 5°	HB7020	—	—	—	eShop	eShop	—	—	10	P	M	0.3	
21J 27 3699	Parting-off / grooving in- sert	HB7010	eShop	eShop	eShop	—	—	—	—	10	P	K	0.2	
21J 27 3700		HB7020	eShop	eShop	eShop	—	—	—	—	10	P	M	0.2	
21J 27 3702		HB7215	—	eShop	eShop	—	—	—	—	10	K	P	0.2	
21L 27 3709		HU7310	—	eShop	—	eShop	—	—	—	10	N	Ti	0.05	
21L 27 3697		HU7310	—	eShop	—	eShop	eShop	eShop	eShop	10	N	Ti	0.2	
21J 27 3707		HB7010	—	—	—	eShop	eShop	—	—	10	P	K	0.3	
21J 27 3704		HB7020	—	—	—	eShop	eShop	—	—	10	P	M	0.3	
21J 27 3706		HB7215	—	—	—	eShop	eShop	—	—	10	K	P	0.3	
21J 27 3708	HB7020	—	—	—	—	—	eShop	eShop	10	P	M	0.4		
Tolerance groove width w			mm	±0.03	±0.03	±0.03	±0.03	±0.04	±0.04	±0.04				
f			mm/rev.	0.03 – 0.12	0.05 – 0.15	0.06 – 0.17	0.07 – 0.2	0.08 – 0.26	0.08 – 0.28	0.09 – 0.34				



27

Chip breaker for small diameters and reduction in cutting forces.

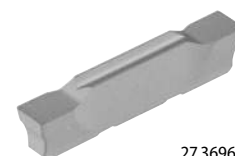


27 3701

Groove width w	mm	1,5	2	2,5	3	4	5	6		●	○	Corner radius R mm
27 3672	CU7025	eShop	—	—	—	—	—	—	10	P	—	0.1
27 3674	HB7010	eShop	—	—	—	—	—	—	10	P	K	0.1
27 3676	HB7020	eShop	—	—	—	—	—	—	10	P	M	0.1
27 3698	CU7025	eShop	eShop	eShop	eShop	eShop	—	—	10	P	—	0.2
27 3701	HB7020	—	eShop	—	eShop	—	—	—	10	P	M	0.2
27 3703	CU7025	—	—	—	—	—	eShop	eShop	10	P	—	0.3
Tolerance groove width w	mm	±0.03	±0.03	±0.03	±0.03	±0.04	±0.04	±0.04				
f	mm/rev.	0.03 – 0.12	0.05 – 0.15	0.06 – 0.17	0.07 – 0.2	0.08 – 0.26	0.08 – 0.28	0.09 – 0.34				

Double-sided grooving insert – blanks

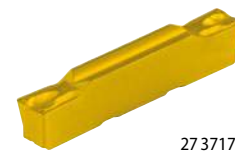
Application: For grinding specific profiles.



27 3696

Groove width w	mm	2,2	2,7	3,4	4,2	5,2	6,55		●	○	
27 3696	Grooving insert Blank HU7310	eShop	eShop	eShop	eShop	eShop	eShop	10	N	Ti	

Double-ended grooving inserts finishing



27 3717

Groove width w	mm	2	3	4	5	6		●	○	Corner radius R mm
27 3718	HB7010	eShop	eShop	eShop	—	—	10	P	K	0.2
27 3715	HB7020	eShop	eShop	eShop	—	—	10	P	M	0.2
27 3717	HB7215	eShop	eShop	eShop	—	—	10	K	P	0.2
27 3716	HB7310	eShop	eShop	eShop	—	—	10	N	Ti	0.2
27 3722	CU7025	eShop	—	—	—	—	10	P	—	0.2
27 3720	CU7025	—	eShop	eShop	eShop	eShop	10	P	—	0.4
27 3723	HB7010	—	eShop	eShop	—	—	10	P	K	0.4
27 3719	HB7020	—	eShop	eShop	eShop	eShop	10	P	M	0.4
27 3721	HB7215	—	eShop	eShop	—	—	10	K	P	0.4
Tolerance groove width w	mm	±0.03	±0.03	±0.04	±0.04	±0.04				
a _p	mm	0.2 – 1.1	0.4 – 1.5	0.5 – 2	0.7 – 2.6	0.9 – 3				
f	mm/rev.	0.04 – 0.14	0.05 – 0.2	0.06 – 0.22	0.07 – 0.25	0.08 – 0.3				

Double-ended grooving insert medium machining



27 3729

Groove width w	mm	2	2,5	3	4	5	6		●	○	Corner radius R mm
27 3728	HB7010	eShop	—	eShop	—	—	—	10	P	K	0.2
27 3725	HB7020	eShop	eShop	eShop	—	—	—	10	P	M	0.2
27 3727	HB7215	eShop	eShop	eShop	—	—	—	10	K	P	0.2
27 3732	CU7025	eShop	—	—	—	—	—	10	P	—	0.2
27 3730	CU7025	—	—	eShop	eShop	eShop	eShop	10	P	—	0.4
27 3733	HB7010	—	—	eShop	eShop	—	—	10	P	K	0.4
27 3729	HB7020	—	—	eShop	eShop	eShop	eShop	10	P	M	0.4
27 3731	HB7215	—	—	eShop	eShop	—	—	10	K	P	0.4
27 3734	HB7020	—	—	eShop	eShop	eShop	eShop	10	P	M	0.8
Tolerance groove width w	mm	±0.03	±0.03	±0.03	±0.04	±0.04	±0.04				
a _p	mm	0.2 – 1.1	0.5 – 1.2	0.8 – 1.7	0.9 – 2.2	1 – 2.7	1.2 – 3.3				
f	mm/rev.	0.05 – 0.15	0.08 – 0.2	0.1 – 0.23	0.1 – 0.26	0.12 – 0.3	0.13 – 0.33				

Double-ended grooving inserts full radius



27 3736

Groove width w	mm	2	2,5	3	4	5	6		●	○
21J 27 3736	CU7025	–	–	eShop	eShop	eShop	eShop	10	P	–
21J 27 3738	HB7010	eShop	–	eShop	eShop	–	–	10	P	K
21J 27 3735	HB7020	eShop	eShop	eShop	eShop	eShop	eShop	10	P	M
21J 27 3737	HB7215	eShop	eShop	eShop	eShop	–	–	10	K	P
21L 27 3739	HB7310	eShop	–	eShop	eShop	–	–	10	N	Ti
Tolerance groove width w	mm	±0.03	±0.03	±0.03	±0.04	±0.04	±0.04			
a _p	mm	0.1 – 0.6	0.2 – 0.7	0.5 – 1.2	0.6 – 1.6	0.7 – 2	0.8 – 2.3			
f	mm/rev.	0.06 – 0.14	0.08 – 0.16	0.1 – 0.18	0.1 – 0.22	0.12 – 0.26	0.12 – 0.3			

Single-ended grooving inserts CBN / PCD

27 3743/3749 – With laser-profiled chipbreaker for optimum chip formation.



27 3740



27 3743



27 3746



27 3749

Groove width w	mm	2	3	4	5	6	●	Corner radius R mm
21H 27 3740	Grooving insert straight cutting edge CBN825	eShop	eShop	eShop	eShop	–	H	0.2
21L 27 3743	Grooving insert straight cutting edge PCD	eShop	eShop	eShop	eShop	eShop	N	0.2
21H 27 3746	Grooving insert full radius CBN825	eShop	eShop	eShop	eShop	eShop	H	–
21L 27 3749	Grooving insert full radius PCD	eShop	eShop	eShop	eShop	eShop	N	–
Tolerance groove width w	mm	±0.03						

Double-ended grooving inserts for grooves < 3 mm

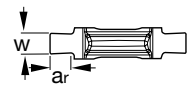
DIN 471	DIN 472
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Application: With grooving toolholder for insert width 3 mm.

Note: The tool holders must be suitably reworked to suit the groove width.



27 3665



Groove width w	mm	0,5	0,7	0,8	0,9	1,15	1,35	1,65	1,90	2,15	2,65		●	○
21L 27 3665	Grooving insert	HB7010	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10	P	K
a _r	mm	1.3	1.3	1.3	1.3	1.4	1.6	1.9	2.15	2.4	2.9			
for retaining ring to DIN471/472	mm	0.4	0.6	0.7	0.8	1	1.2	1.5	1.75	2	2.5			

Double-ended grooving inserts for grooves < 3 mm set



27 3667

Type			0,9-2,65		●	○
21L 27 3667	Set of grooving inserts	HB7010	eShop		P	K
Content:						
2× each No. 273665			Size 0.9; 1.15; 1.35;			
1× each No. 273665			Size 1.65; 1.90; 2.15; 2.65			



27



HELIGRIP toolholder

27 3766/3767 Size 16/3; 16/4 – Straight design (Figure 1).

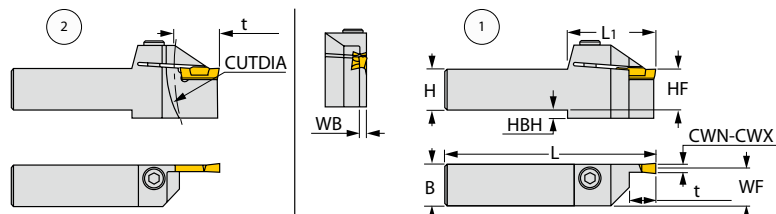
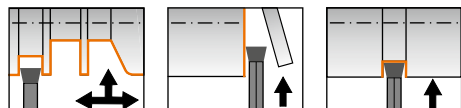
Size 20/3; 25/3; 20/4; 25/4; 20/5; 25/5; 25/6 – Version with radius (figure 2).

Suitable for: Inserts No. 273403 – 273413.

Application: For groove turning, grooving and parting off.



27 3766_25/3



Shank size / groove width w	260	27 3766	260	27 3767	t _{max}	L ₁	L	CWX	CUTDIA	WF	WB
		HELIGRIP HELI toolholder									
mm		right-hand		left-hand	mm	mm	mm	mm	mm	mm	mm
16/3		—		—	12	30	135	3.18		14.8	2.4
20/3		—		—	—	29	140	3.18	40	18.8	2.4
25/3		—		—	—	36.4	140	3.18	40	23.8	2.4
16/4		—		—	12	29	135	4.76		14.4	3.2
20/4		—		—	—	42	140	4.76	50	18.4	3.2
25/4		—		—	—	42	140	4.76	50	23.4	3.2
20/5		—		—	—	42	140	5	50	17.9	4.2
25/5		—		—	—	42	140	5	50	22.9	4.2
25/6		—		—	—	51.4	140	6.35	60	22.4	5.2



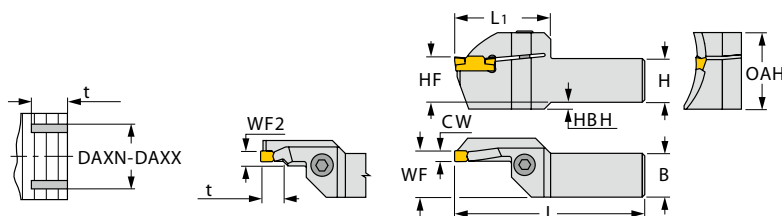
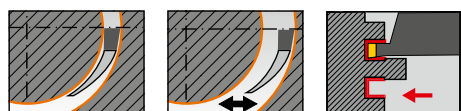
HELIGRIP compact toolholder

Suitable for: Inserts No. 273403 – 273413.

Application: For face grooving and facing.



27 3768_100-140



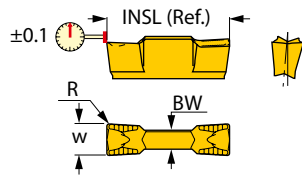
Ø range / cut DAXN-DAXX	260	27 3768	Groove width w	t _{max}	L ₁	B	L	HBH	OAH	WF	H
		HELIGRIP HFHR compact toolholder									
mm		reinforced right-hand	mm	mm	mm	mm	mm	mm	mm	mm	mm
40-48		—	4	25	44	20	140	—	31	20.6	20
100-140		—	4	25	44	25	150	—	37	25.74	25
140-240		—	4	25	44	25	150	—	37	25.6	25
35-40		—	5	20	39	20	140	—	31	21	20
130-180		—	5	32	51	25	150	—	37	26	25
180-800		—	5	32	51	25	150	—	37	26	25
100-180		—	6	32	51	25	150	—	37	26.4	25
180-400		—	6	32	51	25	150	3	40	26.4	25
400-3000		—	6	32	51	25	150	3	40	26.4	25

HELIGRIP inserts

Suitable for: Blade carrier No. 273766 – 273768.

Application: For axial and radial grooving, parting off and internal machining.
(HELIGRIP inserts for axial grooving application only compatible with HFHR holder).

Note: The minimum order quantity corresponds to one pack unit quantity (VPE)
or a multiple thereof.



Chip breaker Y

Positive chip breaker. Soft cut. Reduced cutting forces.



Groove width w / corner radius R	26C	27 3403	26C	27 3405	26C	27 3407		Tolerance groove width w	INSL	a_p	f when turning	f when parting off	f when axial grooving	f when facing
		HELIGRIP inserts												
mm		IC8250		IC830		IC808		mm	mm	mm	mm/rev.	mm/rev.	mm/rev.	mm/rev.
3/0,2		—		—		—	10	0.05	15.8	0.25 – 1.8	0.14 – 0.18	0.07 – 0.11	0.08 – 0.2	0.1 – 0.2
3/0,3		—		—		—	10	0.05	15.8	0.4 – 1.8	0.15 – 0.19	0.07 – 0.11	0.08 – 0.2	0.1 – 0.2
4/0,2		—		—		—	10	0.05	19	0.5 – 1.9	0.16 – 0.21	0.09 – 0.14	0.1 – 0.24	0.15 – 0.3
4/0,4		—		—		—	10	0.05	19	0.25 – 2.4	0.18 – 0.24	0.09 – 0.15	0.1 – 0.24	0.15 – 0.3
5/0,5		—		—		—	10	0.05	19	0.6 – 3	0.2 – 0.3	0.11 – 0.2	0.12 – 0.24	0.15 – 0.35
5/0,8		—		—		—	10	0.05	19	1 – 3	0.23 – 0.35	0.11 – 0.21	0.12 – 0.24	0.15 – 0.35
6/0,5		—		—		—	10	0.05	19	0.6 – 3	0.22 – 0.36	0.13 – 0.23	0.12 – 0.28	0.15 – 0.4
6/0,8		—		—		—	10	0.05	19	1 – 3.6	0.24 – 0.42	0.13 – 0.25	0.12 – 0.28	0.15 – 0.4
●		P		UNI		UNI								
○		M		—		—								
⚙		⚙		⚙		⚙								
Chip breaker		ZC		ZC		ZC								
v_c main application m/min		45 – 260		50 – 140		30 – 200								

Chip breaker T

Optimised chip forming and chip control.



Groove width w / corner radius R	26C	27 3409	26C	27 3411	26C	27 3413		Tolerance groove width w	INSL	a_p	f when turning	f when parting off
		HELIGRIP inserts										
mm		IC8250		IC830		IC808		mm	mm	mm	mm/rev.	mm/rev.
3/0,3		—		—		—	10	0.05	15.8	0.4 – 1.8	0.14 – 0.18	0.07 – 0.11
4/0,4		—		—		—	10	0.05	19	0.5 – 2.4	0.18 – 0.24	0.09 – 0.15
5/0,8		—		—		—	10	0.05	19	1 – 3	0.23 – 0.35	0.11 – 0.21
6/0,8		—		—		—	10	0.05	19	1 – 3.6	0.24 – 0.42	0.13 – 0.25
●		P		UNI		UNI						
○		M		—		—						
⚙		⚙		⚙		⚙						
Chip breaker		T		T		T						
v_c main application m/min		45 – 260		50 – 140		80 – 180						



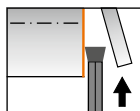
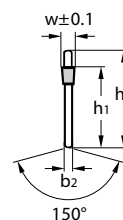
27

HOLEX Parting off tools for parting-off inserts No. 278029 - 278036

All sizes with just one insert seat for two groove widths (3 mm and 4 mm). For grooving inserts No. 278029 – 278036.

Attention: Parting-off insert can be clamped only in combination with base holders No. 278008 and 278009. The parting-off insert is easily replaced only by releasing the front screw on the clamping strip of the base holder.

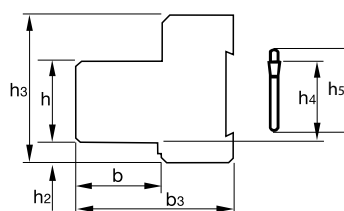
Note: From 14 mm groove depth onwards the second cutter comes into contact with the workpiece. This can lead to scoring.



Blade height h_5	mm	26	32
278005	Parting-off tool	neutral	eShop
for maximum workpiece Ø	mm	60	65
Width b_2	mm	2.6	
Height h_1	mm	21.4	25
L	mm	110	150

HOLEX Toolholders for parting-off tools No. 278005

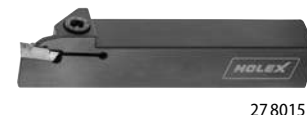
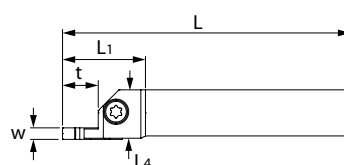
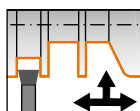
The slotted clamping strip allows the parting-off insert to be clamped in combination with grooving tool No. 278005. Can also be used for many standard grooving tools from other manufacturers (with other insert clamping).



Shank height h	mm	16	20	25	For blade height h_5 mm	Clamping screw
278008	Toolholder for parting-off tools	eShop	eShop	—	26	279816 1
278009		—	—	eShop	32	279816 2
h_4	mm	16	20	25		
h_2	mm	12	8	8		
h_3	mm	39	39	48		
b	mm	16	20	20		
b_3	mm	29	33	36		
L_{tot}	mm	78	78	98		

HOLEX Grooving toolholder with groove depth $t_{max} \leq 21$ mm

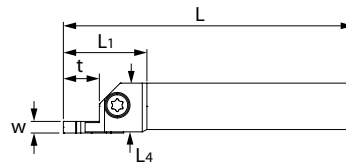
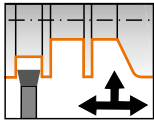
All sizes with just one insert seat for two groove widths (3 mm and 4 mm). For grooving inserts No. 278029 – 278036.



Shank size	278015	278016	Groove width w	t_{max}	L_4	L_1	L	Screw
mm	right-hand	left-hand	mm	mm	mm	mm	mm	
16	eShop	eShop	3; 4	21	16	39	109	279816 3 (SW5; 5 Nm)
20	eShop	eShop	3; 4	21	20	39	129	279816 4 (SW5; 5 Nm)
25	eShop	eShop	3; 4	21	25	39	129	279816 4 (SW5; 5 Nm)

HOLEX Grooving toolholder with groove depth $t_{\max} \leq 12$ mm

All sizes with just one insert seat for two groove widths (3 mm and 4 mm). For grooving inserts No. 278029 – 278036.

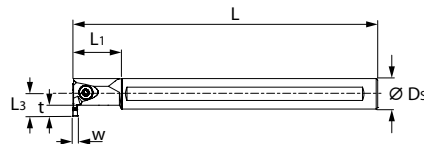
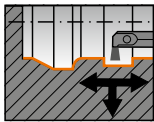


278017

Shank size	22B 27 8017	22B 27 8018	Groove width w	$t_{\max}$	L_4	L_1	L	Screw
	Grooving toolholder							
mm	right-hand	left-hand	mm	mm	mm	mm	mm	
16	eShop	eShop	3; 4	12	16	30	100	279816 3 (SW5; 5 Nm)
20	eShop	eShop	3; 4	12	20	30	120	279816 4 (SW5; 5 Nm)
25	eShop	eShop	3; 4	12	25	30	120	279816 4 (SW5; 5 Nm)

HOLEX Boring bar for grooving

All sizes with just one insert seat for two groove widths (3 mm and 4 mm). For grooving inserts No. 278029 – 278036.



278023

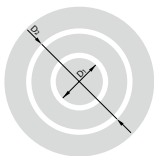
Shank Ø D_s	22B 27 8023	22B 27 8024	Groove width w	$t_{\max}$ internal machining	Ø $D_{\min}$	L_3	L_1	L	Screw
	Boring bar for grooving								
mm	right-hand	left-hand	mm	mm	mm	mm	mm	mm	
20	eShop	eShop	3; 4	5	16.5	8	30	200	279816 5 (TX20; 5 Nm)
25	eShop	eShop	3; 4	5	25	12	50	200	279816 6 (SW5; 5 Nm)
32	eShop	eShop	3; 4	5	30	14.5	60	250	279816 7 (SW5; 5 Nm)

HOLEX Mono grooving toolholder for face grooving

All sizes with just one insert seat for two groove widths (3 mm and 4 mm).

For grooving inserts No. 278029 – 278036.

Note: D_1 = minimum Ø for the first groove / D_2 = maximum Ø for the first cut.
 $D_2 = 999$ in the size designation corresponds to theoretically infinite.



right-hand



left-hand



278043



278044

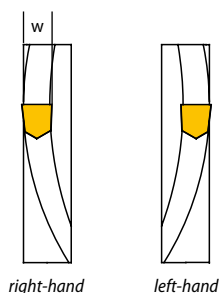
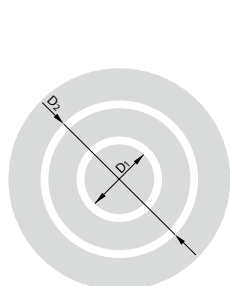
Ø range Groove D_1 / D_2	22B 27 8041	22B 27 8042	22B 27 8043	22B 27 8044	22B 27 8045	22B 27 8046	$t_{\max}$	Shank width b			
	Mono grooving toolholder										
	for face grooving										
mm	right-hand	left-hand	right-hand	left-hand	right-hand	left-hand	mm	27 8041 27 8042	27 8043 27 8044	27 8045 27 8046	
35/50	eShop	eShop	eShop	eShop	eShop	eShop	14	16×16	20×20	25×25	
50/75	eShop	eShop	eShop	eShop	eShop	eShop	14	16×16	20×20	25×25	
65/100	eShop	eShop	eShop	eShop	eShop	eShop	14	16×16	20×20	25×25	
90/130	—	—	eShop	eShop	eShop	eShop	14	—	20×20	25×25	
110/170	—	—	eShop	eShop	eShop	eShop	14	—	20×20	25×25	
160/250	—	—	eShop	eShop	eShop	eShop	14	—	20×20	25×25	
240/350	—	—	eShop	eShop	eShop	eShop	14	—	20×20	25×25	
340/999	—	—	eShop	eShop	eShop	eShop	14	—	20×20	25×25	
Groove width w mm	3; 4	3; 4	3; 4	3; 4	3; 4	3; 4					

MOLEX Mono grooving toolholder cranked for face grooving

All sizes with just one insert seat for two groove widths (3 mm and 4 mm).

For grooving inserts No. 278029 – 278036.

Note: D_1 = minimum $\varnothing$ for the first groove / D_2 = maximum $\varnothing$ for the first cut.
 $D_2 = 999$ in the size designation corresponds to theoretically infinite.



27 8055



27 8056

$\varnothing$ range Groove D_1 / D_2	22B 27 8051	22B 27 8052	22B 27 8053	22B 27 8054	22B 27 8055	22B 27 8056	t_{max}	Shank width b			
	Mono grooving toolholder, cranked										
	for face grooving										
mm	right-hand	left-hand	right-hand	left-hand	right-hand	left-hand	mm	27 8051 27 8052	27 8053 27 8054	27 8055 27 8056	
35/50	eShop	eShop	eShop	eShop	eShop	eShop	14	16×16	20×20	25×25	
50/75	eShop	eShop	eShop	eShop	eShop	eShop	14	16×16	20×20	25×25	
65/100	eShop	eShop	eShop	eShop	eShop	eShop	14	16×16	20×20	25×25	
90/130	–	–	eShop	eShop	eShop	eShop	14	–	20×20	25×25	
110/170	–	–	eShop	eShop	eShop	eShop	14	–	20×20	25×25	
160/250	–	–	eShop	eShop	eShop	eShop	14	–	20×20	25×25	
240/350	–	–	eShop	eShop	eShop	eShop	14	–	20×20	25×25	
340/999	–	–	eShop	eShop	eShop	eShop	14	–	20×20	25×25	
Groove width w mm	3; 4	3; 4	3; 4	3; 4	3; 4	3; 4					

MOLEX Parting-off / grooving inserts

Suitable for: Holders No. 278005 and 278015 – 278056.

Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni						
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N							
HBG25				150	130	120	100					100	80		140									



27 8029



27 8036

Groove width w	mm	3	4			
22D 27 8029	Parting-off / grooving insert neutral	HBG25	eShop	eShop	10	P M
22D 27 8036	Parting-off / grooving insert Full radius	HBG25	eShop	eShop	10	P M
Corner radius (27 8029)	mm	0.3				
Tolerance groove width w	mm	±0.04				
f	mm/rev.	0.07 – 0.2				

There's more in it for you!

The entire tooling catalogues for the following brands are available from the Hoffmann Group – just ask for them!



Garant Profile turning inserts external/internal

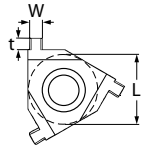
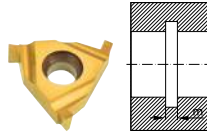
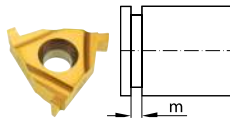
Suitable for: GARANT toolholders (external/internal) No. 271997 – 272172, for threading insert size 16 or 9.3 respectively.

Suitable for/ v _c [m/min]	Alu plastics 	Alu cast 	Alu cast > 10 % Si								INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	M	M	S	K	N	N				
27 1005–27 1940	250	180	150	150	130	100	90	40					100	100	50	130	150		●			● ○

Profile turning inserts for DIN 471/472

DIN
471

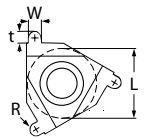
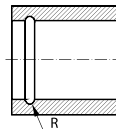
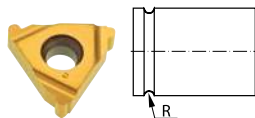
DIN
472



Width groove m (H13)	27 1005	27 1010	27 1015		w	t _{max}	for circlips to DIN 471 / 472 ring thickness
	Partial profile insert for DIN 471, external, right-hand	Partial profile insert for DIN 472 internal, right-hand					
	HB7010	HB7010	HB7010			27 1005 27 1015	27 1010
mm					mm	mm	mm
0,5	eShop	eShop	—	10	0.59	1.3	0.7
0,7	eShop	eShop	—	10	0.79	1.3	0.7
0,8	eShop	eShop	—	10	0.89	1.3	0.7
0,9	eShop	eShop	eShop	10	0.99	1.3	0.7
1,1	eShop	eShop	eShop	10	1.19	1.3	1
1,3	eShop	eShop	eShop	10	1.39	1.5	1.5
1,6	eShop	—	eShop	10	1.69	1.8	—
1,85	eShop	—	eShop	10	1.94	2	—
2,15	eShop	—	eShop	10	2.24	2	—
2,65	eShop	—	eShop	10	2.74	2	—
Thickness mm	3.6	2.42	3.6				
Insert size L mm	16	9.3	16				
Shim	No. 272604 size S	—	No. 272624 size S				

Profile turning inserts for DIN 7993

DIN
7993



Groove R	27 1025	27 1035		w	t _{max}
	Partial profile insert for DIN 7993, external, right-hand	Partial profile insert for DIN 7993 internal, right-hand			
	HB7010	HB7010			
mm				mm	mm
0,4	eShop	—	10	0.8	0.6
0,6	eShop	eShop	10	1.2	0.8
0,9	eShop	—	10	1.8	1.1
1	eShop	eShop	10	2	1.2
Thickness mm	3.6	3.6			
Insert size L mm	16	16			
Shim	No. 272604 size S	No. 272624 size S			

Profile turning insert sets

Type	ER/IR
27 1920 Partial profile insert set size 16 for circlips, right-hand HB7010	eShop
Machining direction	right-hand
Content: Partial profile, DIN 471 and DIN 472	No. 271005 and 271015 size 1.1; 1.3; 1.6; 1.85
Shim	No. 272604 and 272624 size S

Type	ER/IR
27 1940 Partial profile insert set size 16 for round section snap rings, right-hand HB7010	eShop
Machining direction	right-hand
Content: Partial profile, DIN 7993	No. 271025 size 0.4; 0.6; 0.9; 1 No. 271035 size 0.6; 0.9; 1
Shim	No. 272604 and 272624 size S



DIN
471

DIN
472

DIN
7993

27

Garant Grooving toolholder for triangular grooving inserts

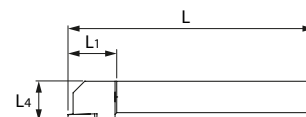
Grooving toolholder 0° for external radial grooving

Note: For right-hand toolholders use right-hand inserts, for left-hand toolholders use left-hand inserts.

Shank size	21W 27 3910	21W 27 3911	L ₁	L ₁	L	Insert screw
	Grooving toolholder					
mm	right-hand	left-hand	mm	mm	mm	
12	eShop	eShop	16.2	21.4	100	279815 13
16	eShop	eShop	20.2	21.4	125	279815 13
20	eShop	eShop	25.2	21.4	125	279815 13
25	eShop	eShop	30.2	21.4	150	279815 13



27 3910



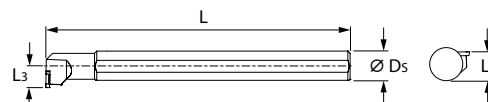
Grooving toolholder for internal radial grooving

Note: For right-hand toolholders use left-hand inserts, for left-hand toolholders use right-hand inserts.

Shank Ø D _s	21W 27 3914	21W 27 3915	Ø D _{min}	L ₃	L ₂	L	Insert screw
	Boring bar						
mm	right-hand	left-hand	mm	mm	mm	mm	
25	eShop	eShop	30.5	17.5	11.5	250	279815 13
32	eShop	eShop	40	23	15	250	279815 13

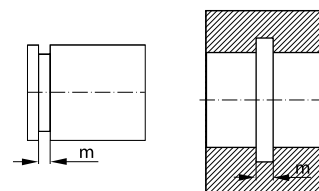
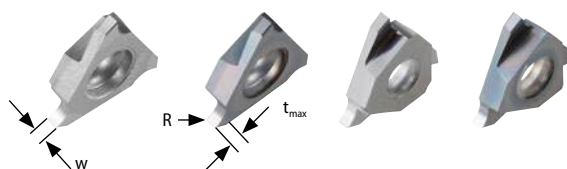


27 3914

DIN
471DIN
472

Garant Triangular grooving inserts

Grooving inserts for retaining ring profile grooves, external and internal



Slot width m (H13)	21J 27 3900	21J 27 3902	21J 27 3906	21J 27 3908		w	t _{max}	Corner radius R	for circlips to DIN 471 / 472 ring thickness
	Grooving insert								
	right-hand HU9315	right-hand HB9635	left-hand HU9315	left-hand HB9635		mm	mm	mm	mm
0,5	eShop	eShop	eShop	eShop	10	0.525	1.2	0.05	0.4
0,7	eShop	eShop	eShop	eShop	10	0.75	1.2	0.05	0.6
0,8	eShop	eShop	eShop	eShop	10	0.85	1.2	0.05	0.7
0,9	eShop	eShop	eShop	eShop	10	0.95	2	0.05	0.8
1,0	eShop	eShop	eShop	eShop	10	1	2	0.05	—
1,1	eShop	eShop	eShop	eShop	10	1.1	2	0.05	1
1,3	eShop	eShop	eShop	eShop	10	1.3	2	0.2	1.2
1,5	eShop	eShop	eShop	eShop	10	1.5	2.5	0.2	—
1,6	eShop	eShop	eShop	eShop	10	1.6	2.5	0.2	1.5
1,85	eShop	eShop	eShop	eShop	10	1.85	2.5	0.2	1.75
2,0	eShop	eShop	eShop	eShop	10	2	2.5	0.2	—
2,15	eShop	eShop	eShop	eShop	10	2.15	2.5	0.2	2
2,5	eShop	eShop	eShop	eShop	10	2.5	2.5	0.2	—
2,65	eShop	eShop	eShop	eShop	10	2.65	2.5	0.2	2.5
3,0	eShop	eShop	eShop	eShop	10	3	2.5	0.2	—
●	N	P	N	P					
○	—	M	—	M					
⊗	●	●	●	●					
v _c main application	mm/min	70 – 280	110 – 170	70 – 280	110 – 170				
v _s secondary application	mm/min	—	90 – 140	—	90 – 140				

PENTA GROOVING SYSTEMS FOR A WIDE RANGE OF APPLICATIONS.

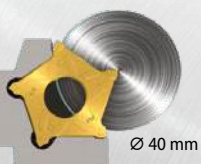
5 cutting edges on one insert.
Best ratio of price per cutting edge.

FLASHPENTA

ECO PARTING AND GROOVING LINE

FLASHPENTA

- For all machine types.
- Groove width: 2–3 mm.
- Groove depth: ≤ 20 mm (in 3 graduations).



FLASHPENTA. The highly economical system.

- Excellent flatness and surface quality when parting off.
- Inserts can be mounted on both right and left holders.
- Universal tool material grade IC908 for a wide range of applications.
- Dovetail clamping of the inserts in the holder for maximum stability and easy handling.

PENTACUT

PARTING & GROOVING LINE

PENTACUT 34

- For universal lathes and multi-spindle machines.
- Groove width: 1.5–4.0 mm.
- Groove depth: ≤ 10 mm.

PENTACUT 24

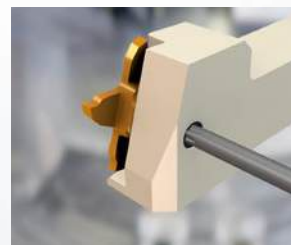
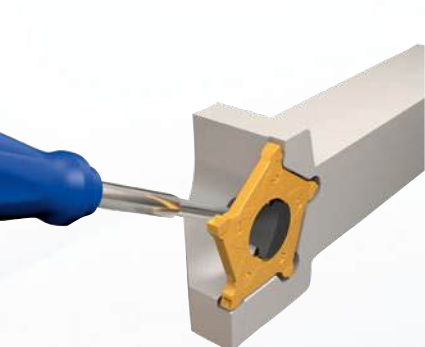
- For universal lathes and multi-spindle machines.
- Groove width: 0.5–5.0 mm.
- Groove depth: ≤ 6.5 mm.

PENTACUT 17

- For sliding headstock lathes and multi-spindle machines.
- Groove width: 0.25–3.18 mm.
- Groove depth: ≤ 4 mm.

PENTACUT. The highly variable system.

- A wide range of geometries is available (e.g. thread turning and grooving of retaining ring grooves).
- A wide range of tool materials is available.
- A wide range of chip breakers ensures effective chip clearance, even in demanding materials.
- Stable and precise tangential clamping of the inserts in the holder.
- Clamping or loosening possible on both sides of the holder.





PENTACUT PENTA 17 toolholder

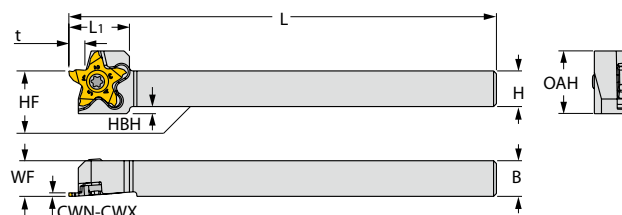
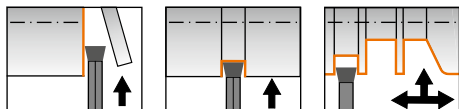
Suitable for: Inserts No. 273956 – 273959.

Application: For flush work on workpiece shoulders for groove widths of 0.25 mm – 3.18 mm.

Note: For right-hand toolholders use right-hand inserts, for left-hand toolholders use left-hand inserts.



27 3950



Shank size / insert size	26D 27 3950	26D 27 3951	t _{max}	L ₁	L	HBH	OAH
	PENTACUT PCH-17 toolholder						
mm	right-hand	left-hand	mm	mm	mm	mm	mm
10/17	—	—	4	17	120	2	15.6
12/17	—	—	4	17	120	—	17.6
16/17	—	—	4	17	120	—	21.6
20/17	—	—	4	17	120	—	25.6
25/17	—	—	4	17	120	—	30.6

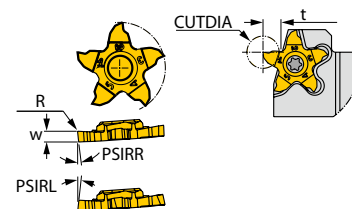


PENTACUT PENTA 17 inserts

Suitable for: Toolholder No. 273950 – 273951.

Application: Universal system for machining small components. For parting off, grooving, threading and reverse turning.

Note: The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



27 3956

27 3957

Chip breaker P

Application: For parting off and grooving. Positive chip breaker. Soft-cutting.

Groove width w / insert size	26K 27 3956	26K 27 3957	Corner radius R	CUTDIA	t _{max}	f
	PENTACUT 17 N-P inserts					
mm	right-hand IC1008	left-hand IC1008	mm	mm	mm	mm/rev.
0,25/17	—	—	5	1.2	0.6	0.02 – 0.03
0,5/17	—	—	5	4	2	0.02 – 0.04
0,8/17	—	—	5	5	2.5	0.02 – 0.04
1/17	—	—	5	6	3	0.02 – 0.05
1,2/17	—	—	5	6	3	0.02 – 0.05
1,5/17	—	—	5	8	4	0.02 – 0.07
2/17	—	—	5	8	4	0.02 – 0.08
●	UNI	UNI				
⚙	●	●				
Chip breaker	P	P				
v _c main application	m/min 60 – 180	m/min 60 – 180				

Chip breaker NP

Application: For grooving and groove turning. Soft-cutting.



27 3958

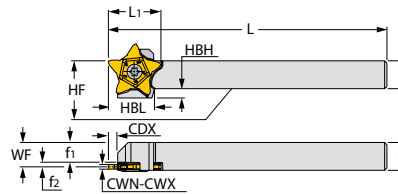
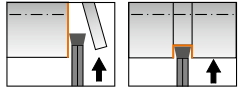
27 3959

Groove width w / insert size	26K 27 3958	26K 27 3959	Corner radius R	CUTDIA	t _{max}	a _p	f when grooving	f when parting off
	PENTACUT 17 N-NP inserts							
mm	right-hand IC1008	left-hand IC1008	mm	mm	mm	mm	mm/rev.	mm/rev.
2/17	—	—	5	0.8	32	4	0.1 – 2.5	0.05 – 0.15
3/17	—	—	5	0.8	32	4	0.1 – 3.1	0.05 – 0.19
●	UNI	UNI						
⚙	●	●						
Chip breaker	NP	NP						
v _c main application	m/min 50 – 150	m/min 50 – 150						



PENTACUT PENTA 24-34 toolholder

Suitable for: Inserts No. 273937 – 273939.



Shank size / insert size	260	27 3924	260	27 3925	t_{max}	L_1	L	HBH
		PENTACUT PCH 24-34 toolholder						
mm		right-hand	left-hand		mm	mm	mm	mm
12/24		—	—		6.5	19.5	120	4
16/24		—	—		6.5	19.5	120	—
20/24		—	—		6.5	19.5	120	—
25/24		—	—		6.5	19.5	135	—
16/34		—	—		10	31	120	9
20/34		—	—		10	31	120	6
25/34		—	—		10	31	135	—



PENTACUT PENTA 24-34 inserts

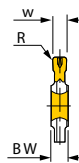
Suitable for: Toolholder No. 273924 – 273925.

Application: First choice for precision grooving. Parting off is possible. Also suitable for interrupted cutting.

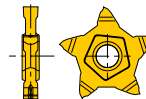
Note: The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.

Chip breaker J

Positive chip former. Soft-cutting. Low to medium feed rates.



± 0.04

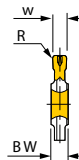


27 3937

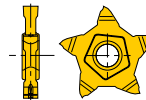
Groove width w / insert size	26K	27 3937		Corner radius R	Tolerance groove width w	BW	t_{max}	Tolerance corner radius R	f
		PENTACUT 24N-J/34N-J inserts							
mm		IC908		mm	mm	mm	mm	mm	mm/rev.
1,5/24		—	5	0.1	0.02	4	5	0.02	0.03 – 0.1
2/24		—	5	0.2	0.02	4	6	0.03	0.04 – 0.12
3/24		—	5	0.2	0.02	4	6.5	0.03	0.04 – 0.16
4/24		—	5	0.4	0.02	—	6.25	0.03	0.04 – 0.18
1,5/34		—	5	0.2	0.02	—	8.5	0.02	0.04 – 0.12
2/34		—	4	0.15	0.02	—	8.5	0.02	0.03 – 0.1
3/34		—	4	0.2	0.02	—	10	0.02	0.04 – 0.16
●		UNI							
⊗		●							
Chip breaker		J							
v_c main application	m/min	60 – 180							

Chip breaker C

Chip breakers with a pronounced protective chamfer. Medium to high feed rates.



± 0.04



27 3939

Groove width w / insert size	26K	27 3939		Corner radius R	Tolerance groove width w	t_{max}	Tolerance corner radius R	f
		PENTACUT 24N-C/34N-C inserts						
mm		IC908		mm	mm	mm	mm	mm/rev.
1,5/24		—	5	0.1	0.02	5	0.05	0.05 – 0.11
2/24		—	5	0.2	0.02	6	0.05	0.05 – 0.16
3/24		—	5	0.2	0.02	6.2	0.05	0.1 – 0.2
1,5/34		—	4	0.15	0.02	8	0.03	0.03 – 0.07
2/34		—	4	0.2	0.02	8	0.03	0.04 – 0.14
3/34		—	4	0.2	0.02	10	0.03	0.06 – 0.22
4/34		—	4	0.3	0.02	10	0.03	0.06 – 0.3
●		UNI						
⊗		●						
Chip breaker		C						
v_c main application	m/min	60 – 180						



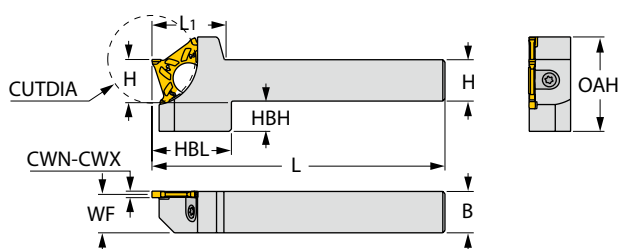
27



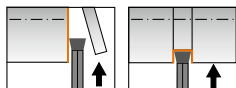
PENTAIQGRIP toolholder

Suitable for: Inserts No. 273580 – 273581.

Application: First choice for parting off up to diameter 40 mm. Grooving is possible.



273576



Shank size / insert size	26D 27 3576	26D 27 3577	L ₁	L	HBH	HBL	WF	H
	PENTAIQGRIP PCH-IQ toolholder							
mm	right-hand	left-hand	mm	mm	mm	mm	mm	mm
12/22	—	—	26.9	100	8	25.7	11.4	25.5
16/22	—	—	26.9	120	4	23.2	15.4	25.5
12/32	—	—	28.4	100	14	29.5	11.5	33.6
16/32	—	—	28.4	120	10	29.5	15.5	33.6
20/32	—	—	28.4	120	6	29.5	19.5	33.6
20/40	—	—	33.3	135	13	35.6	18.7	43.5
25/40	—	—	33.3	135	8	33.6	23.7	43.5



FLASHPENTA inserts

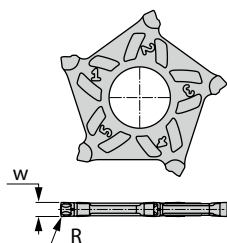
273580 – For parting off and grooving soft components. Minimises burr formation. Positive chip breaker. Soft-cutting. Low to medium feed rates.

273581 – For parting off rods and hard materials, and for difficult applications. Chip breakers with a pronounced protective chamfer. Medium to high feed rates.

Suitable for: Toolholder No. 273576 – 273577.

Attention: The maximum groove depth $t_{\max}$ applies only up to workpiece $\varnothing 40$ mm. From workpiece $\varnothing > 40$ mm, the maximum groove depth is reduced.

Note: The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



273580



273581

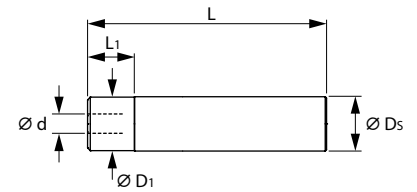
Groove width w / insert size	26K 27 3580	26K 27 3581		Corner radius R	Tolerance groove width w	$t_{\max}$	Tolerance corner radius R	f
	FLASHPENTA PMN D-J/D-C inserts							
mm	IC908	IC908		mm	mm	mm	mm	mm/rev.
2/22	—	—	2	0.2	0.03	11	0.03	0.04 – 0.12
2/32	—	—	2	0.2	0.03	16	0.03	0.04 – 0.14
3/40	—	—	2	0.2	0.03	20	0.03	0.06 – 0.22
●	UNI	UNI						
⚙	●	●						
Chip breaker	J	C						
v_c main application m/min	60 – 180	60 – 180						



Garant Holder for carbide inserts (axial grooving)

With through-coolant and adjustment screw for positioning the tools.

Suitable for: Cutter inserts No. 274061 and 274063.



Ø D _s	21U	27 4100	21U	27 4102	L	L ₁	Ø D ₁	Clamping screw	Adjustment screw
	Holder for carbide inserts								
mm		Ø d = 6 mm		Ø d = 8 mm	mm	mm	mm		
16		eShop		eShop	88	19	20	279815 15	279815 16
20		eShop		eShop	88	19	20	279815 15	279815 16



Garant Carbide inserts for axial grooving

With through-coolant and additional flank face cooling.

Suitable for: Toolholder No. 274100 – 274102.

Attention: Order size = minimum groove Ø.

Larger groove diameters can be achieved without modification.

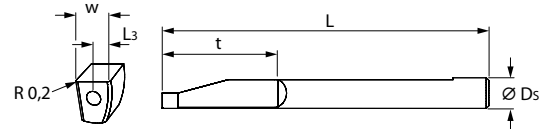
D₁ = D_{min} internal diameter.

D₂ = D_{min} external diameter.

L version with greater grooving depth t_{max}.



27 4061



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si								INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N					
27 4061/4063	50	90	70	55	55	50	40	35				45	45	25	55	50		●			●	

Ø D _{min} groove D ₁ /D ₂	21L	27 4061	21L	27 4063	Ø D _s	w	L ₃	L	t _{max}	f
	Carbide inserts for axial grooving									
mm		right-hand		left-hand	mm	mm	mm	mm	mm	mm
8/12		eShop		eShop	6	2	1.7	64	15	0.01 – 0.03
8/12L		eShop		eShop	6	2	1.7	64	22	0.01 – 0.03
7/12		eShop		eShop	6	2.5	2.2	64	22	0.01 – 0.03
14/20		eShop		eShop	8	3	2.5	64	27	0.01 – 0.03
14/20L		eShop		eShop	8	3	1.6	80	43	0.01 – 0.03
12/20		eShop		eShop	8	4	1.6	80	43	0.01 – 0.03



Garant Boring bars for axial grooving

■ Carbide insert screwed on to the end face, positive force transmission due to end face serrations.

■ Insert change is very easy to handle.

27 3969 – Elliptical profile for very high flexional resistance.

27 3966/3969 – Low-vibration carbide shank with soldered steel head and hardened insert seat.



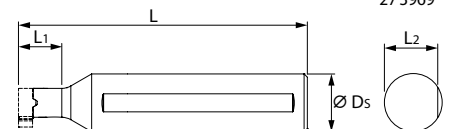
27 3963



27 3966



27 3969

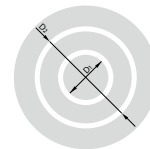


Shank Ø D _s / overhang L ₁	21U	27 3963	21U	27 3966	21U	27 3969	L ₂	L	Insert screw
		Boring bar steel		Boring bar carbide					
mm				round		elliptical	mm	mm	
12/12		eShop		—		—	11	70	279810 1
12/20		eShop		—		—	11	78	279810 1
12/34		—		eShop		eShop	11	100	279810 1
12/45		—		eShop		eShop	11	110	279810 1
12/64		—		—		eShop	11	130	279810 1
16/12		eShop		—		—	15	92	279810 1
16/20		eShop		—		—	15	100	279810 1
16/34		—		eShop		eShop	15	100	279810 1
16/45		—		eShop		eShop	15	110	279810 1
16/64		—		—		eShop	15	130	279810 1
16/75		—		—		eShop	15	145	279810 1

Garant Cutter inserts for axial grooving

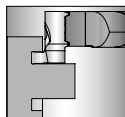
Attention:

Ordering size = minimum groove $\varnothing$.
 Capable of cutting larger groove $\varnothing$ without modification.
 $D_1 = D_{\min}$ internal $\varnothing$.
 $D_2 = D_{\min}$ external $\varnothing$.
 L type with larger groove depth $t_{\max}$.

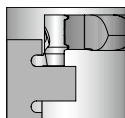


Suitable for/ v _c [m/min]	Alu plastics 	Alu	Alu cast > 10 % Si									INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	M	M	S	K	N	N					
27 3973–27 3979	200	120	120	110	110	90	90	90	90				80	60	25	60	100						

For external axial grooving



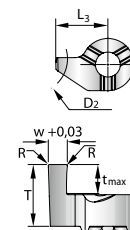
$\varnothing D_{\min}$ groove D_1/D_2	2TH	27 3973	T	L_3	$t_{\max}$	R	w	f
		Neutral cutter insert						
mm		HB720	mm	mm	mm	mm	mm	mm/rev.
10/12		eShop	7.3	9	1.5	0.2	1	0.01 – 0.02
9/12		eShop	8.3	9	2.5	0.2	1.5	0.01 – 0.02
8/12		eShop	8.8	9	3	0.2	2	0.01 – 0.02
8/12L		eShop	10.7	9	5	0.2	2	0.01 – 0.02
7/12		eShop	8.8	9	3	0.2	2.5	0.01 – 0.02
7/12L		eShop	10.7	9	5	0.2	2.5	0.01 – 0.02
6/12		eShop	8.8	9	3	0.2	3	0.01 – 0.02
6/12L		eShop	10.7	9	5	0.2	3	0.01 – 0.02



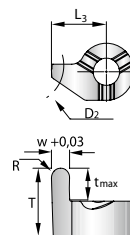
$\varnothing D_{\min}$ groove D_1/D_2	2TH	27 3975	T	L_3	$t_{\max}$	R	w	f
		Full-radius cutter insert						
mm		HB720	mm	mm	mm	mm	mm	mm/rev.
8/12L		eShop	10.7	9	5	1	2	0.01 – 0.02
7/12L		eShop	10.7	9	5	1.25	2.5	0.01 – 0.02
6/12L		eShop	10.7	9	5	1.5	3	0.01 – 0.02



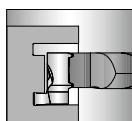
27 3973



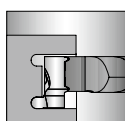
27 3975



For internal axial grooving



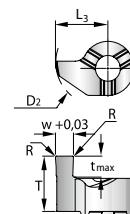
$\varnothing D_{\min}$ groove D_1/D_2	2TH	27 3977	$\varnothing D_{\min}$	T	L_3	$t_{\max}$	R	w	f
		Neutral cutter insert							
mm		HB720	mm	mm	mm	mm	mm	mm	mm/rev.
12/14		eShop	14	7.7	9	1.5	0.2	1	0.01 – 0.02
11/14		eShop	14	8.7	9	2.5	0.2	1.5	0.01 – 0.02
10/14		eShop	14	9.2	9	3	0.2	2	0.01 – 0.02
10/14L		eShop	14	10.7	9	5	0.2	2	0.01 – 0.02
9/14		eShop	14	9.2	9	3	0.2	2.5	0.01 – 0.02
9/14L		eShop	14	10.7	9	5	0.2	2.5	0.01 – 0.02
8/14		eShop	14	9.2	9	3	0.2	3	0.01 – 0.02
8/14L		eShop	14	10.7	9	5	0.2	3	0.01 – 0.02



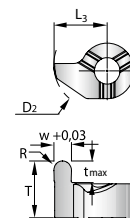
$\varnothing D_{\min}$ groove D_1/D_2	2TH	27 3979	$\varnothing D_{\min}$	T	L_3	$t_{\max}$	R	w	f
		Full-radius cutter insert							
mm		HB720	mm	mm	mm	mm	mm	mm	mm/rev.
12/14		eShop	14	7.7	9	1.5	0.5	1	0.01 – 0.02
10/14		eShop	14	9.2	9	3	1	2	0.01 – 0.02
8/14		eShop	14	9.2	9	3	1.5	3	0.01 – 0.02



27 3977



27 3979





Garant Vario Plus Eco grooving toolholder

Optimised system stability thanks to multiple screw clamping and form fit.

Supplied with: Including assembly screws.

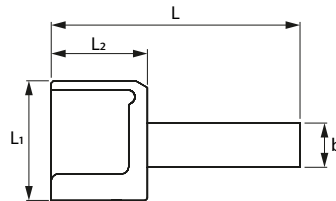
Note: Coolant transfer only possible in conjunction with GARANT Master eco toolholders No. 317906 – 319136. Optional connection possibility via hose connection (G1/8 inch) No. 269207 and 269208.

Straight 0°

Suitable for:

27 4500 – Vario plus eco blade carriers No. 274510; 274512; 274514; 274516; 274518; 274520; 274522; 274540.

27 4501 – Vario plus Eco blade carriers No. 274511; 274513; 274515; 274517; 274519; 274521; 274523; 274541.



27 4500

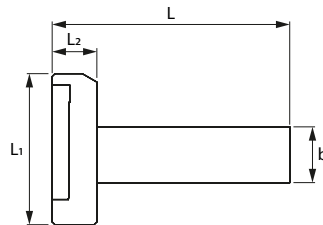
Shank width b	27 4500	27 4501	L	L ₁	L ₂	Assembly bolt	Clamping screw	Clamping strip
	Vario plus Eco toolholder straight 0°							
mm	right-hand	left-hand	mm	mm	mm			
20	eShop	eShop	112.5	54	43.5	279815 9	279815 24	279928 7
25	eShop	eShop	127.5	54	43.5	279815 9	279815 24	279928 7

Cranked 90°

Suitable for:

27 4502 – Vario plus Eco blade carriers No. 274511; 274513; 274515; 274517; 274519; 274521; 274523; 274541.

27 4503 – Vario plus eco blade carriers No. 274510; 274512; 274514; 274516; 274518; 274520; 274522; 274540.



27 4502

Shank width b	27 4502	27 4503	L	L ₁	L ₂	Assembly bolt	Clamping screw	Clamping strip
	Vario plus Eco toolholder cranked 90°							
mm	right-hand	left-hand	mm	mm	mm			
20	eShop	eShop	85	54	16	279815 9	279815 24	279928 7
25	eShop	eShop	100	54	16	279815 9	279815 24	279928 7



Garant Vario Plus Eco blade carrier, straight

Suitable for:

27 4510 – Vario plus Eco toolholder No. 274500; 274503; 274530.

27 4511 – Vario plus Eco toolholder No. 274501; 274502; 274531.

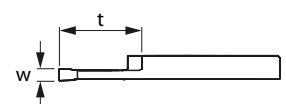
Attention: Without clamping screws (these are supplied with the toolholders).

Note: With a groove width of 2 mm and 3 mm, the groove depth $t_{\max}$ = 21 mm is limited to workpiece $\varnothing$ up to 150 mm. With a workpiece $\varnothing$ > 150 mm, $t_{\max}$ = 17 mm applies.
With a groove width of 4 mm, the groove depth $t_{\max}$ = 28 mm is limited to workpiece $\varnothing$ up to 150 mm. With a workpiece $\varnothing$ > 150 mm, $t_{\max}$ = 24 mm applies.

Groove width w	27 4510	27 4511	t _{max}	suitable indexable insert	Clamping screw
	Vario plus Eco blade carrier straight				
mm	right-hand	left-hand	mm		
2	eShop	eShop	21	No. 273656 – 273749	279815 9
3	eShop	eShop	21	No. 273656 – 273749	279815 9
4	eShop	eShop	28	No. 273656 – 273749	279815 9



27 4510





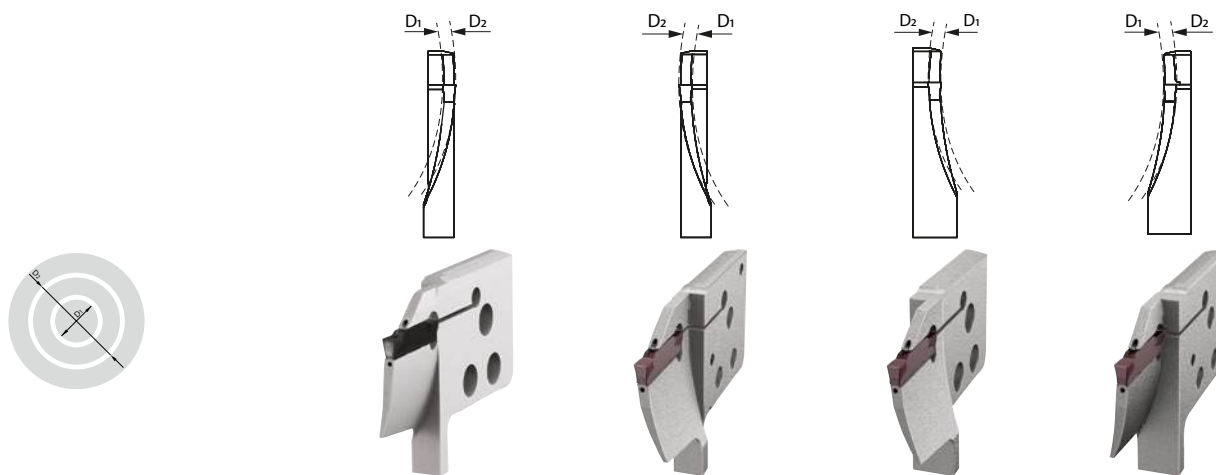
Garant Vario Plus Eco blade carrier for face grooving

Optimised system stability thanks to multiple screw clamping and form fit.

Suitable for: Toolholder No. 274500 – 274503, 274530, 274531.

Attention: Without clamping screws (these are supplied with the toolholders).

Note: D_1 = minimum $\varnothing$ for the first groove / D_2 = minimum $\varnothing$ for the second groove.



Groove width $w = 2$ mm

Ø range for groove D ₁ / D ₂	21U	27 4512	21U	27 4513	21U	27 4514	21U	27 4515	t _{max}	suitable indexable insert
	Vario plus Eco blade carrier, convex				Vario plus Eco blade carrier, concave					
	for face grooving									
mm	right-hand		left-hand		right-hand		left-hand		mm	
26/34	eShop		eShop		eShop		eShop		16	No. 273656 – 273749
33/43	eShop		eShop		eShop		eShop		16	No. 273656 – 273749
41/53	eShop		eShop		eShop		eShop		16	No. 273656 – 273749
51/67	eShop		eShop		eShop		eShop		16	No. 273656 – 273749
65/85	eShop		eShop		eShop		eShop		16	No. 273656 – 273749
82/110	eShop		eShop		eShop		eShop		16	No. 273656 – 273749
105/143	eShop		eShop		eShop		eShop		18	No. 273656 – 273749
138/190	eShop		eShop		eShop		eShop		18	No. 273656 – 273749
Groove width w	mm	2		2		2		2		

Groove width $w = 3$ mm

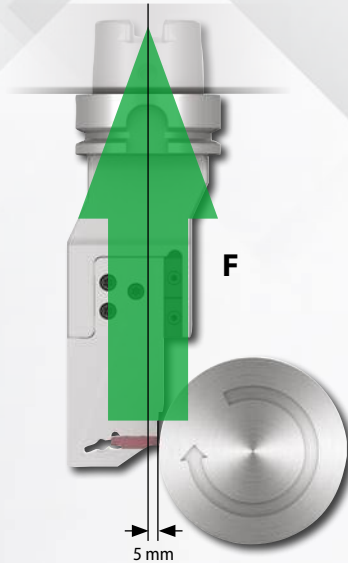
Ø range for groove D ₁ / D ₂	21U	27 4516	21U	27 4517	21U	27 4518	21U	27 4519	t _{max}	suitable indexable insert
	Vario plus Eco blade carrier, convex				Vario plus Eco blade carrier, concave					
	for face grooving									
mm	right-hand		left-hand		right-hand		left-hand		mm	
26/39	eShop		eShop		eShop		eShop		18	No. 273656 – 273749
33/50	eShop		eShop		eShop		eShop		18	No. 273656 – 273749
43/60	eShop		eShop		eShop		eShop		18	No. 273656 – 273749
53/76	eShop		eShop		eShop		eShop		18	No. 273656 – 273749
67/100	eShop		eShop		eShop		eShop		18	No. 273656 – 273749
90/130	eShop		eShop		eShop		eShop		21	No. 273656 – 273749
110/170	eShop		eShop		eShop		eShop		21	No. 273656 – 273749
140/230	eShop		eShop		eShop		eShop		21	No. 273656 – 273749
Groove width w	mm	3	3		3		3			

Groove width $w = 4$ mm

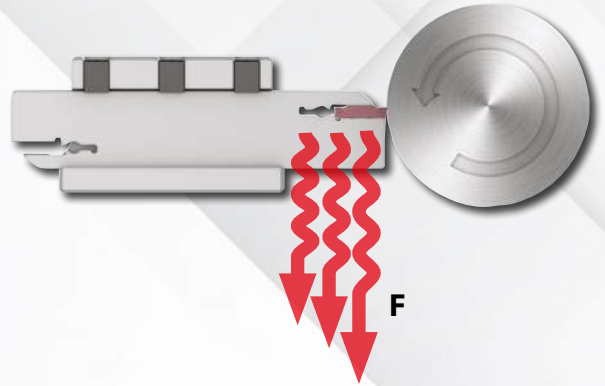
Ø range for groove D ₁ / D ₂	21U	27 4520	21U	27 4521	21U	27 4522	21U	27 4523	t _{max}	suitable indexable insert
	Vario plus Eco blade carrier, convex				Vario plus Eco blade carrier, concave					
	for face grooving									
mm	right-hand		left-hand		right-hand		left-hand		mm	
26/41	eShop		eShop		eShop		eShop		22	No. 273656 – 273749
38/55	eShop		eShop		eShop		eShop		22	No. 273656 – 273749
52/72	eShop		eShop		eShop		eShop		25	No. 273656 – 273749
67/100	eShop		eShop		eShop		eShop		25	No. 273656 – 273749
90/130	eShop		eShop		eShop		eShop		28	No. 273656 – 273749
110/170	eShop		eShop		eShop		eShop		28	No. 273656 – 273749
150/250	eShop		eShop		eShop		eShop		28	No. 273656 – 273749
Groove width w	mm	4		4		4		4		

Garant**VARIO PLUS ECO Y GROOVING – ADVANTAGES****Parting off with Y-axis**

- Favourable application of force directly into the spindle.
- Vibrations are significantly reduced – better surface quality.
- High feed rates are possible.
- Prerequisite: Y-axis on the machine.
- Ideal for multi-task machines.
- Peak height offset in y = -5 mm.

**Standard parting-off method**

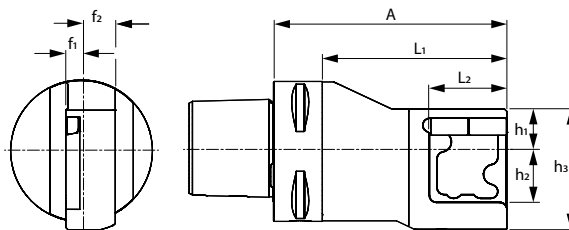
- Can be used for all machines.
- Attractively priced.
- Unfavourable application of force at larger groove depths.
- Susceptible to vibrations.

**Garant****Vario Plus Eco toolholder HSK-T / PSC**

Optimised system stability thanks to multiple screw clamping and form fit.

Suitable for: Vario plus Eco blade carrier.

Supplied with: Including assembly screws.



27 4531

Shank mounting type	21U	27 4530	21U	27 4531	Dimension A	L ₁	L ₂	f ₁	f ₂	h ₁	h ₂	h ₃	Assembly bolt	Clamping screw	Clamping strip
	Vario plus Eco toolholder														
	right-hand		left-hand												
HSK63	eShop		eShop		105	79	35	7	15	19	23	54	279815 9	279815 24	279928 7
PSC63	eShop		eShop		105	83	35	7	15	19	23	54	279815 9	279815 24	279928 7

**Garant****Vario Plus Eco Y blade carrier, straight**

For parting off shafts with a maximum diameter of 90 mm.

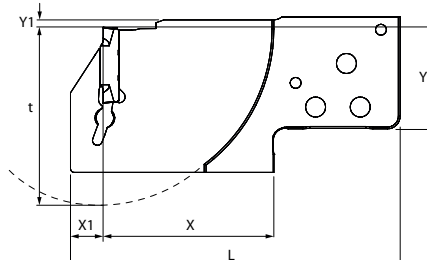
Suitable for:

27 4540 – Vario plus Eco toolholder No. 274530; 274500; 274503.

27 4541 – Vario plus Eco toolholder No. 274531; 274501; 274502.

Attention:

Without clamping screws (these are supplied with the toolholders).



27 4541

Groove width w	21U	27 4540	21U	27 4541	t _{max}	L	X	X1	Y1	Y	suitable indexable insert	Clamping screw
	Vario Plus Eco Y blade carrier											
mm	right-hand		left-hand		mm	mm	mm	mm	mm	mm		
3	eShop		eShop		45	90.8	47	9	2	28	273656 – 273749	279815 9

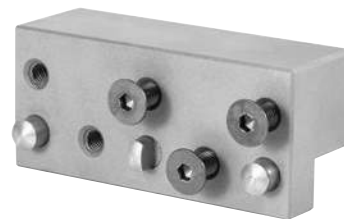
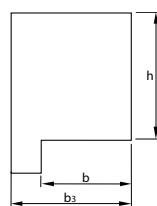


27



Garant Holder for Medium / Medium-Plus blade carrier

Application: For blade carriers No. 274010 – 274052; 274104 – 274110; 274136 – 274137.



Shank height h	mm	20	25	32	40	Assembly bolt	Dowel pins with plane surfaces	Dowel pin
2TU 27 4002	Medium / Medium-Plus toolholder	eShop	eShop	eShop	eShop	279815 19	279934 1	279936 1
b	mm	18	18	28	–			
b ₃	mm	30	30	40	40			
L _{tot}	mm	85						

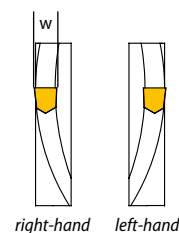
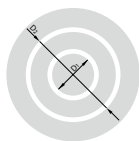


Garant Blade carrier for face grooving

Application: In conjunction with toolholder No. 274002 or alternatively with adapter No. 274001 and suitable toolholder for parting-off tools.

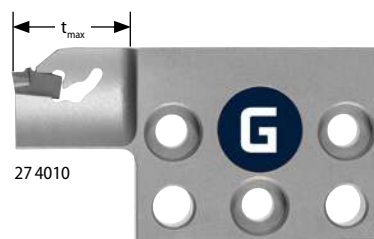
Attention: Without clamping screws (these are supplied with the toolholders). The assembly key No. 279940 1-3 must be ordered separately.

Note: D₁ = minimum Ø for the first first groove / D₂ = minimum Ø for the second groove.



Medium blade carrier

For inserts No. 275000 – 275015.

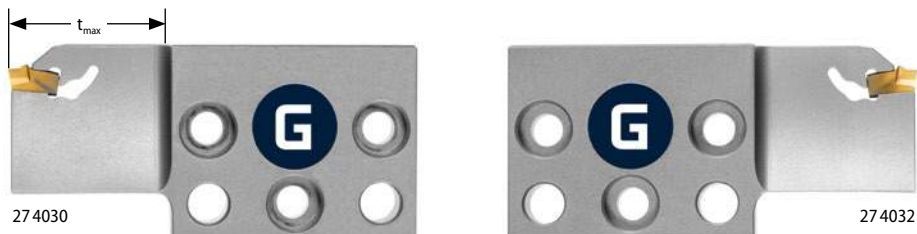


Ø range Groove D ₁ / D ₂	21U	27 4010	21U	27 4012	21U	27 4014	21U	27 4016	t _{max}	
	Medium blade carrier									
	for face grooving								27 4010 27 4012	27 4014 27 4016
	mm	right-hand		left-hand		right-hand		left-hand	mm	mm
19/30	eShop		eShop		eShop		eShop	16	12	
24/35	eShop		eShop		eShop		eShop	16	12	
29/40	eShop		eShop		eShop		eShop	22	14	
34/50	eShop		eShop		eShop		eShop	22	14	
44/60	eShop		eShop		eShop		eShop	26	16	
Groove width w	mm	3		3		3		3		

Ø range Groove D ₁ / D ₂	2TU	27 4020	2TU	27 4022	2TU	27 4024	2TU	27 4026	t _{max}	
	Medium blade carrier								27 4020 27 4022	27 4024 27 4026
	for face grooving									
	mm	right-hand	left-hand	right-hand	left-hand	mm	mm			
17/30	eShop	eShop	eShop	eShop	18	14				
22/35	eShop	eShop	eShop	eShop	18	14				
27/40	eShop	eShop	eShop	eShop	24	16				
32/50	eShop	eShop	eShop	eShop	24	16				
42/60	eShop	eShop	eShop	eShop	28	18				
Groove width w	mm	4	4	4	4					

Medium-Plus blade carrier

For grooving inserts No. 275021 – 275048. $D_2 = 999$ in the size designation corresponds to theoretically infinite.



Ø range Groove D_1 / D_2	21U	27 4030	21U	27 4032	21U	27 4034	21U	27 4036	t_{max}	
		Medium-Plus blade carrier							27 4030	27 4034
		for face grooving							27 4032	27 4036
mm		right-hand	left-hand	right-hand	left-hand				mm	mm
54/75		eShop	eShop	eShop	eShop				26	16
69/100		eShop	eShop	eShop	eShop				28	18
94/130		eShop	eShop	eShop	eShop				28	18
124/180		eShop	eShop	eShop	eShop				28	18
174/250		eShop	eShop	eShop	eShop				30	20
244/350		eShop	eShop	eShop	eShop				30	20
344/999		eShop	eShop	eShop	eShop				30	20
Groove width w	mm	3	3	3	3					

Ø range Groove D_1 / D_2	21U	27 4040	21U	27 4042	21U	27 4044	21U	27 4046	t_{max}	
		Medium-Plus blade carrier							27 4040	27 4044
		for face grooving							27 4042	27 4046
mm		right-hand	left-hand	right-hand	left-hand				mm	mm
52/75		eShop	eShop	eShop	eShop				28	18
67/100		eShop	eShop	eShop	eShop				30	20
92/130		eShop	eShop	eShop	eShop				30	20
122/180		eShop	eShop	eShop	eShop				30	20
172/250		eShop	eShop	eShop	eShop				32	22
242/350		eShop	eShop	eShop	eShop				32	22
342/999		eShop	eShop	eShop	eShop				32	22
Groove width w	mm	4	4	4	4					

Ø range Groove D_1 / D_2	21U	27 4050	21U	27 4052	t_{max}	
		Medium-Plus blade carrier				
		for face grooving				
mm		right-hand	left-hand		mm	
35/60		eShop	eShop		25	
50/75		eShop	eShop		25	
65/100		eShop	eShop		25	
90/130		eShop	eShop		25	
120/180		eShop	eShop		25	
170/250		eShop	eShop		25	
240/350		eShop	eShop		25	
340/999		eShop	eShop		25	
Groove width w	mm	5; 6		5; 6		

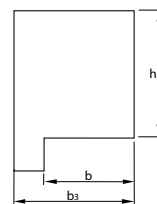


27



Garant Holder for Heavy-Duty blade carrier

Application: For blade carriers No. 274060 – 274076; 274118 – 274120; 274138 – 274139.



27 4004

Shank height h	mm	25	32	40	50	Assembly bolt	Dowel pins with plane surfaces	Dowel pin
27 4004 Heavy-Duty toolholder		eShop	eShop	eShop	eShop	279815 20	279934 2	279936 2
b	mm	18	28	—	—			
b ₃	mm	30	40	40	50			
L _{tot}	mm	140						



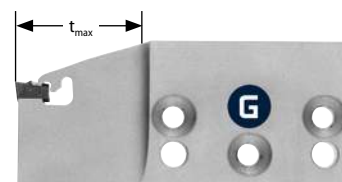
Garant Heavy-Duty blade carrier for face grooving

For grooving inserts No. 275021 – 275048.

Application: In conjunction with toolholder No. 274004 or alternatively with adapter No. 274003 and suitable toolholder for parting-off tools.

Attention: Without clamping screws (these are supplied with the toolholders). The assembly key No. 279940 1-3 must be ordered separately.

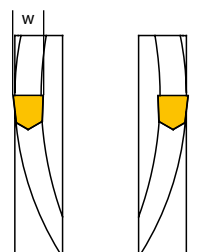
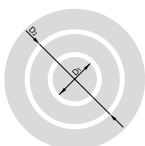
Note: D₁ = minimum Ø for the first groove / D₂ = maximum Ø for the first cut.
D₂ = 999 in the size designation corresponds to theoretically infinite.



27 4060



27 4064



right-hand

left-hand

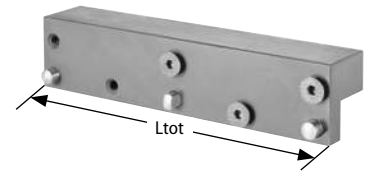
Ø range Groove D ₁ / D ₂	27 4060	27 4064	t _{max}
	Heavy-Duty blade carrier for face grooving		
mm	right-hand	left-hand	mm
35/60	eShop	eShop	30
50/75	eShop	eShop	30
65/100	eShop	eShop	35
90/130	eShop	eShop	40
120/180	eShop	eShop	40
170/250	eShop	eShop	40
240/350	eShop	eShop	40
340/999	eShop	eShop	40
Groove width w mm	5; 6	5; 6	

Ø range Groove D ₁ / D ₂	27 4070	27 4072	27 4074	27 4076	t _{max}	
	Heavy-Duty blade carrier for face grooving				27 4070	27 4074
mm	right-hand	left-hand	right-hand	left-hand	27 4072	27 4076
44/80	—	—	eShop	eShop	—	50
64/100	—	—	eShop	eShop	—	50
84/130	eShop	eShop	eShop	eShop	70	50
114/160	eShop	eShop	eShop	eShop	70	50
144/200	eShop	eShop	eShop	eShop	70	50
184/250	eShop	eShop	eShop	eShop	70	50
234/350	eShop	eShop	eShop	eShop	70	50
334/999	eShop	eShop	eShop	eShop	70	50
Groove width w mm	8	8	8	8		

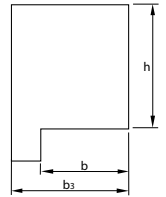


Garant Holder for Heavy-Duty-Plus blade carrier

Application: For blade carriers No. 274079 – 274090; 274124 – 274134.



Shank height h	mm	25	32	40	50	Assembly bolt	Dowel pins with plane surfaces	Dowel pin
27 4006	Heavy-Duty-Plus toolholder	eShop	eShop	eShop	eShop	279815 20	279934 2	279936 2
b	mm	25	32	38	—			
b ₃	mm	37	44	50	50			
L _{tot}	mm	220						



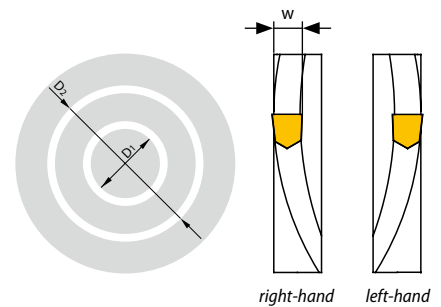
Garant Heavy-Duty-Plus blade carrier for face grooving

For grooving inserts No. 275021 – 275048.

Application: In conjunction with toolholder No. 274006.

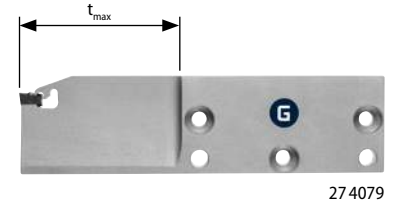
Attention: Without clamping screws (these are supplied with the toolholders). The assembly key No. 279940 1-3 must be ordered separately.

Note: D₁ = minimum Ø for the first groove / D₂ = maximum Ø for the first cut.
D₂ = 999 in the size designation corresponds to theoretically infinite.



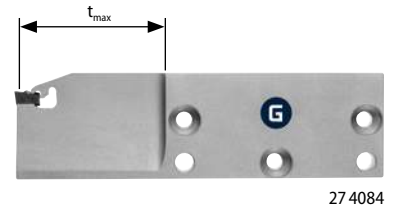
Blade carrier with cutting depth $t_{\max} \leq 120$ mm

Ø range Groove D ₁ / D ₂	27 4079	27 4082	t _{max}
	Heavy-Duty-Plus blade carrier		
	for face grooving		
mm	right-hand	left-hand	mm
144/200	eShop	eShop	120
184/250	eShop	eShop	120
234/350	eShop	eShop	120
334/999	eShop	eShop	120
Groove width w mm	8	8	



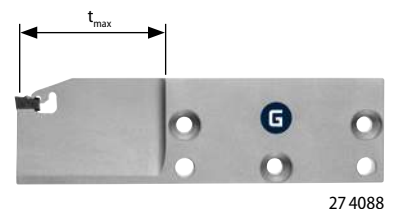
Blade carrier with cutting depth $t_{\max} \leq 100$ mm

Ø range Groove D ₁ / D ₂	27 4084	27 4086	t _{max}
	Heavy-Duty-Plus blade carrier		
	for face grooving		
mm	right-hand	left-hand	mm
114/160	eShop	eShop	100
144/200	eShop	eShop	100
184/250	eShop	eShop	100
234/350	eShop	eShop	100
334/999	eShop	eShop	100
Groove width w mm	8	8	



Blade carrier with cutting depth $t_{\max} \leq 80$ mm

Ø range Groove D ₁ / D ₂	27 4088	27 4090	t _{max}
	Heavy-Duty-Plus blade carrier		
	for face grooving		
mm	right-hand	left-hand	mm
84/130	eShop	eShop	80
114/160	eShop	eShop	80
144/200	eShop	eShop	80
184/250	eShop	eShop	80
234/350	eShop	eShop	80
334/999	eShop	eShop	80
Groove width w mm	8	8	



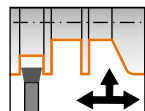
27



Garant Blade carrier for radial grooving

Toolholders No. 273893 – 273894; 319133 20/50.

Attention: Without clamping screws (these are supplied with the toolholders).
The assembly key No. 279940 1-3 must be ordered separately.



27 4118

Medium-Plus blade carrier

Application: In conjunction with toolholder No. 274002 or alternatively with adapter No. 274001 and suitable toolholder for parting-off tools.

Groove width w	21U	27 4104	21U	27 4106	21U	27 4108	21U	27 4110	$t_{\max}$	
		Medium-Plus blade carrier							27 4104	27 4108
		for radial grooving							27 4106	27 4110
mm		right-hand		left-hand		right-hand		left-hand	mm	mm
3		eShop		eShop		eShop		eShop	30	20
4		eShop		eShop		eShop		eShop	32	22
5/6		—		—		eShop		eShop	—	25

Heavy-Duty blade carrier

Application: In conjunction with toolholder No. 274004 or alternatively with adapter No. 274003 and suitable toolholder for parting-off tools.

Groove width w	21U	27 4118	21U	27 4120	$t_{\max}$
		Heavy-Duty blade carrier			
		for radial grooving			
mm		right-hand		left-hand	mm
5/6		eShop		eShop	40
8		eShop		eShop	50

Heavy-Duty-Plus blade carrier

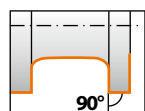
Application: In conjunction with toolholder No. 274006.

Groove width w	21U	27 4124	21U	27 4126	21U	27 4128	21U	27 4130	21U	27 4132	21U	27 4134	$t_{\max}$
		Heavy-Duty-Plus blade carrier											
		for radial grooving											
mm		right-hand		left-hand		right-hand		left-hand		right-hand		left-hand	
8		eShop		eShop		eShop		eShop		eShop		eShop	
										120		100	
												80	

Garant Copy turning tool, modular

Modular copy turning tool for cutting depths up to 70 mm.

Attention: Without clamping screws (these are supplied with the toolholders).



27 4136

Up to cutting depth
 $T_{\max} = 70 \text{ mm}$

Radial Medium / Medium-Plus blade carrier

Application: In conjunction with toolholder No. 274002 or alternatively with adapter No. 274001 and suitable toolholder for parting-off tools.

Insert size	21U	27 4136	21U	27 4137	$t_{\max}$	suitable indexable insert	Set of insert screws
		Radial Medium / Medium-Plus blade carrier					
mm		right-hand		left-hand	mm		
06		eShop		eShop	30	RC.T 0602	269028 22
08		eShop		eShop	40	RC.T 0803	269028 29

Radial Heavy-Duty blade carrier

Application: In conjunction with toolholder No. 274004 or alternatively with adapter No. 274003 and suitable toolholder for parting-off tools.



27 4138

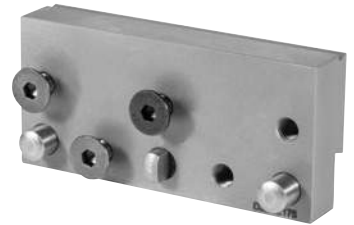
Insert size	21U	27 4138	21U	27 4139	$t_{\max}$	suitable indexable insert	Set of insert screws	Shim	Shim screw
		Radial Heavy-Duty blade carrier							
mm		right-hand		left-hand	mm				
10		eShop		eShop	60	RC.X 1003	269028 1	269005 11	269013 2
12		eShop		eShop	70	RC.X 1204	269028 2	269005 10	269013 2

Garant Adapter for blade carrier / parting-off tool toolholder

Suitable for: Parting-off tool toolholder.

Application:

- 27 4001 – For directly adapting all Medium/Medium-Plus blade carriers No. 274010 – 274137 with toolholder No. 273893; 273986; 273988; 273993; 274045; 278008 or toolholders from many other manufacturers.
- 27 4003 – For direct adaptation of all Heavy-Duty blade carriers No. 274060 – 274139 with toolholder No. 273894; 273990; 273692; 273994; 274097; 278009 or toolholders from many other manufacturers.



27 4001

For blade height h_s	mm	26	32	Assembly bolt	Dowel pins with plane surfaces	Dowel pin
21U 27 4001	Adapter for blade carrier/toolholder	eShop	–	279815 19	279934 1	279936 1
21U 27 4003		–	eShop	279815 20	279934 2	279936 2
L_{tot}	mm	85	80			
Suitable for: Blade carrier		No. 274010 – 274052; 274104 – 274110; 274136 – 274137 (Medium/Medium Plus)	No. 274060 – 274076; 274118 – 274120; 274138 – 274139 (Heavy-Duty)			



Garant Boring bar for grooving

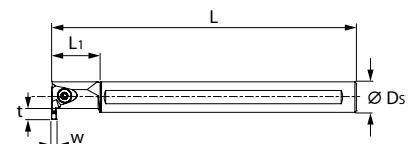
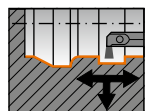
For cutter inserts No. 275000 – 275015.

Application: For grooving from diameter $D_{\min} = 14$ mm.

Attention: The assembly key No. 279940 1-3 must be ordered separately.



27 4170



Type	21U	27 4170	21U	27 4171	$\varnothing D_s$	Groove width w	$t_{\max}$ internal machining	$\varnothing D_{\min}$	L_1	L
		Boring bar for grooving								
		right-hand		left-hand	mm	mm	mm	mm	mm	mm
16/2		eShop		eShop	16	1.5	3	14	25	78
20/2		eShop		eShop	20	1.5	3	16	30	88
20/2L		eShop		eShop	20	1.5	3	18	35	93
25/2		eShop		eShop	25	1.5	5	20	40	103
16/3		eShop		eShop	16	2,2; 3	3	14	25	78
20/3		eShop		eShop	20	2,2; 3	3	16	30	88
20/3L		eShop		eShop	20	2,2; 3	3	18	35	93
25/3		eShop		eShop	25	2,2; 3	5	20	40	103



27

Garant Inserts for facing/radial grooving and groove turning

Suitable for/ v_c [m/min]	Alu plastics	Alu cast > 10 % Si	Alu cast > 10 % Si								INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP	Uni					
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K	N	N					
HB9035				140	120	100	80	50							80				●	○	●	●
HB9140				130	110	90	70	40				100	80						●	○	●	●
HB9310	380	360	280																●	○	●	●

Medium grooving inserts

27 5000–5006 – With ground flanks.

Suitable for: Blade carrier No. 274010 – 274026.

Size 1,5–3 – Boring bars No. 274170 – 274171.



27 5000



27 5003



27 5006

Groove width w	mm	1,5	2,2	3	4	
2H 27 5000	HB9035	eShop	eShop	eShop	eShop	10
2H 27 5003	HB9140	eShop	eShop	eShop	eShop	10
2H 27 5006	HU9310	eShop	eShop	eShop	eShop	10
Corner radius	mm	0.15	0.2	0.2	0.2	
Feed f in steel < 900 N/mm ²	mm/rev.	0.03	0.05	0.08	0.09	



27 5009



27 5012

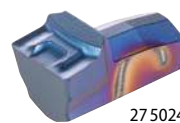


27 5015

Groove width w	mm	3	4	
2H 27 5009	HB9035	eShop	eShop	10
2H 27 5012	HB9140	eShop	eShop	10
2H 27 5015	HU9310	eShop	eShop	10
Feed f in steel < 900 N/mm ²	mm/rev.	0.1	0.12	

Medium-Plus / Heavy-Duty / Heavy-Duty-Plus grooving inserts
Suitable for: Blade carrier No. 274030 – 274134.


27 5021



27 5024



27 5027

Groove width w	mm	3	4	5	6	8	
2H 27 5021	HB9035	eShop	eShop	eShop	eShop	eShop	10
2H 27 5024	HB9140	eShop	eShop	eShop	eShop	eShop	10
2H 27 5027	HU9310	eShop	eShop	eShop	eShop	eShop	10
Corner radius	mm	0.2	0.2	0.2	0.4	0.8	
Feed f in steel < 900 N/mm ²	mm/rev.	0.1	0.12	0.15	0.17	0.19	



27 5042



27 5045



27 5048

Groove width w	mm	3	4	5	6	8	
2H 27 5042	HB9035	eShop	eShop	eShop	eShop	eShop	10
2H 27 5045	HB9140	eShop	eShop	eShop	eShop	eShop	10
2H 27 5048	HU9310	eShop	eShop	eShop	eShop	eShop	10
Feed f in steel < 900 N/mm ²	mm/rev.	0.1	0.12	0.15	0.17	0.19	

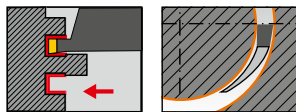


TANGGRIP axial grooving toolholder

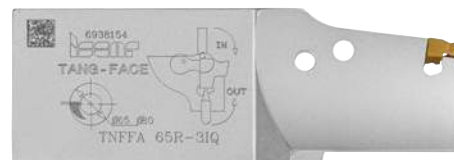
Suitable for: Inserts No. 274422 – 274226.

Application: For face grooving.

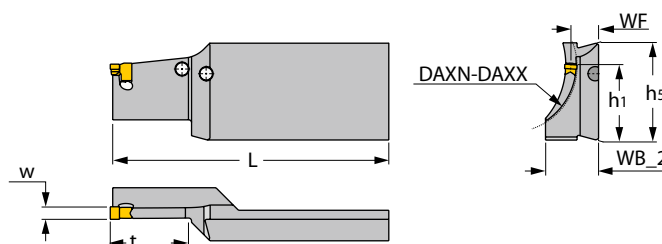
Attention: Please order the assembly key No. 279952 separately.



TNFFA-IQ axial grooving toolholder reinforced



27 4202



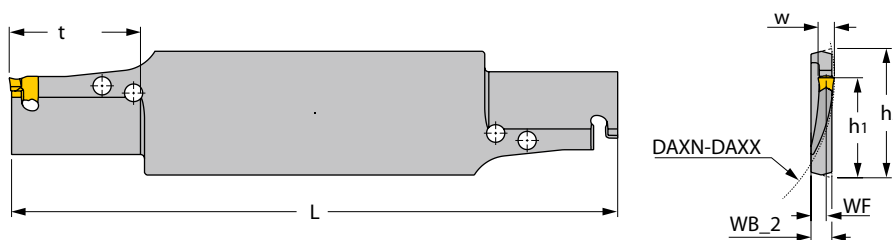
Ø range / cut DAXN-DAXX	26D	27 4202	26D	27 4203	Groove width w	t _{max}	L	WB_2	WF	h ₁	h ₅
		TANGGRIP TNFFA-IQ axial grooving toolholder									
		reinforced									
mm		right-hand		left-hand	mm	mm	mm	mm	mm	mm	mm
54-65		—		—	3	26	90	18.5	9.5	24.8	32
65-80		—		—	3	27	90	18.5	9.5	24.8	32
80-100		—		—	3	27	90	16.7	9.5	24.8	32
60-80		—		—	4	27	90	18	9	24.8	32
80-130		—		—	4	27	90	14.8	9	24.8	32
70-100		—		—	5	30	90	18	9.7	24.8	32
100-180		—		—	5	35	90	18	9.7	24.8	32
80-110		—		—	6	30	90	18	10.2	24.8	32
110-300		—		—	6	35	90	14.8	10.2	24.8	32

TNFFH-IQ axial grooving toolholder standard

With two insert pockets.



27 4204



Ø range / cut DAXN-DAXX	26D	27 4204	26D	27 4205	Groove width w	t _{max}	L	WB_2	WF	h ₁	h ₅
		TANGGRIP TNFFH-IQ axial grooving toolholder									
mm		right-hand		left-hand	mm	mm	mm	mm	mm	mm	mm
90-120		—		—	3	18	150	5.2	4.1	24.8	32
150-500		—		—	4	32	150	5.2	3.8	24.8	32
150,1-500		—		—	5	35	150	5.2	3.5	24.8	32
150-700		—		—	6	35	150	5.2	3.3	24.8	32

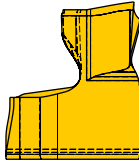
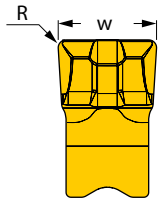
TANGGRIP inserts for axial grooving

Positive chip breaker. Soft-cutting. Optimal chip control and chip evacuation.
Low to medium feed rates.

Suitable for: Blade No. 274202 – 274205.

Application: For face grooving.

Note: The minimum order quantity corresponds to one pack unit quantity (VPE) or a multiple thereof.



27 4222



27 4224

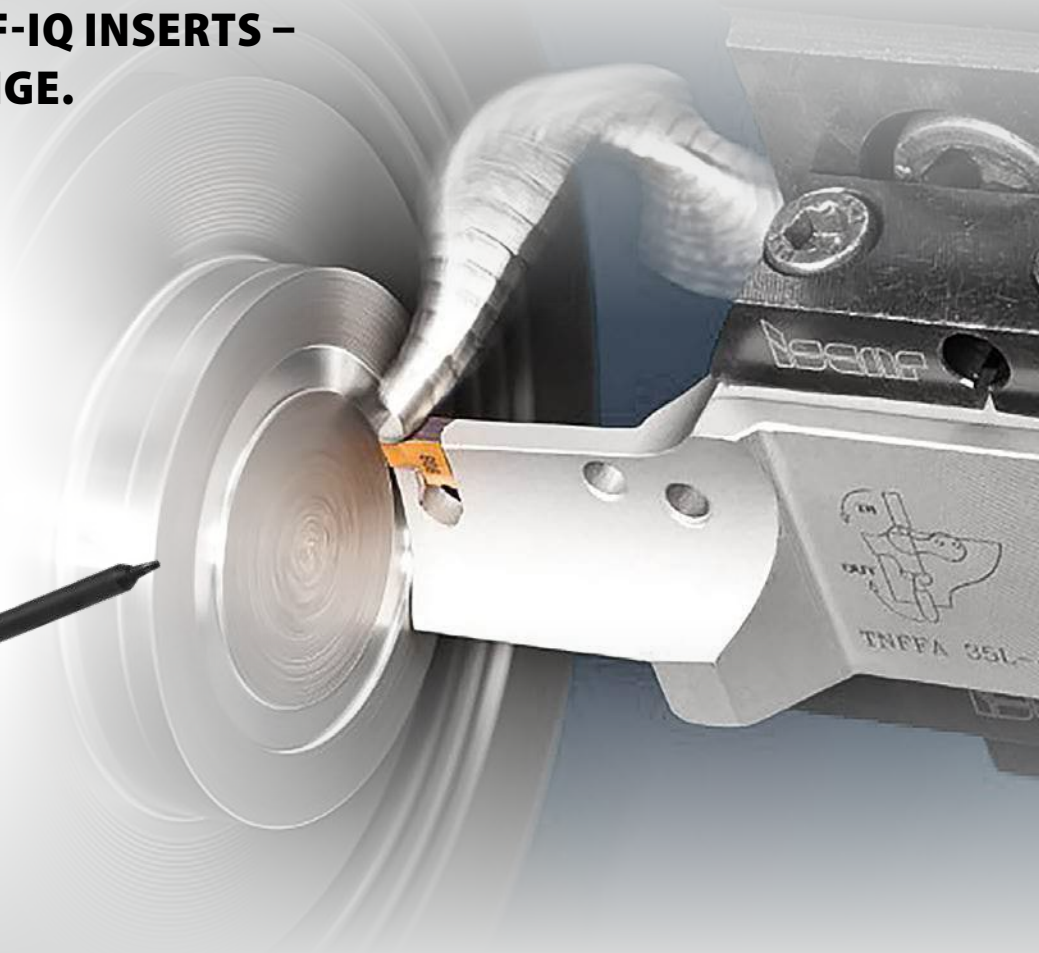


27 4226

Groove width w / corner radius R		26A 27 4222	26A 27 4224	26A 27 4226		Tolerance groove width w	f		
		TANGGRIP TNF-IQ inserts							
mm		IC808	IC808	IC808		mm	27 4222 mm/rev.	27 4224 mm/rev.	27 4226 mm/rev.
3/0,3		—	—	—	10	0.05	0.1 – 0.15	0.08 – 0.1	0.06 – 0.1
4/0,25		—	—	—	10	0.05	0.1 – 0.15	0.08 – 0.12	—
4/0,4		—	—	—	10	0.05	—	—	0.06 – 0.12
5/0,35		—	—	—	10	0.05	0.12 – 0.2	0.12 – 0.2	—
5/0,4		—	—	—	10	0.05	—	—	0.08 – 0.16
6/0,35		—	—	—	10	0.05	0.12 – 0.2	0.12 – 0.2	—
6/0,4		—	—	—	10	0.05	—	—	0.08 – 0.16
		P	M	UNI					
									
Chip breaker		P	M	GN					
v _c main application	m/min	80 – 150	80 – 150	80 – 150					

TANGGRIP TNF-IQ INSERTS – EASY TO CHANGE.

The same cutter insert can be used on both left-hand and right-hand tools.





Knurl forming tool

Grub screw in the shank for clearance angle correction.
Carbide roller pin for increased wear resistance.

Knurl forming tool for 1 knurl

RAA 1×AA	RBL 1×BR	RBR 1×BL	RGV30° 1×GE30°	RGE30° 1×GV30°
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Top face of the shank = tip height

Click-Pin: For quick and easy changing of the knurl.

29 0004 – **Modular design: Can be used as a right-hand or left-hand version.**



29 0000_12



29 0004_20

Shank size	29H 29 0000	29H 29 0001	29H 29 0004	for knurl $\varnothing d_1$	for knurl width w	for knurl bore $\varnothing d_2$	Working range	Roller pin
	Knurl forming tool							
mm	right-hand	left-hand	universal	mm	mm	mm	mm	
10	eShop	eShop	—	10; 15	4	4	3 – 50	299910 1
12	eShop	eShop	—	10; 15	4	4	3 – 50	299910 1
16	eShop	eShop	—	10; 15	4	4	3 – 50	299910 2
20	—	—	eShop	20; 25	8	6	8 – 200	299910 4
25	—	—	eShop	20; 25	8	6	8 – 200	299910 4

Knurl forming tool for 2 knurls

L R	RAA 2×AA	RBL 2×BR	RBR 2×BL	RGE30° BL/R30°	RGE45° BL/R45°
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Modular design: Can be used universally as right-hand or left-hand version.

Size 20; 25 – Click-Pin: For quick and easy changing of the knurl.



29 0010_12



29 0010_20

Shank size	29H	29 0009	29H	29 0010	for knurl Ø d ₁	for knurl width w		for knurl bore Ø d ₂	Working range		Roller pin
	Knurl forming tool					29 0009	29 0010		29 0009	29 0010	
mm	Sliding headstock lathe universal		universal		mm	mm	mm	mm	mm	mm	
10	(eShop)		eShop		10	4	4	4	3 – 25	3 – 25	299910 5
12	eShop		eShop		10	4	4	4	3 – 25	3 – 25	299910 5
16	(eShop)		eShop		15	4	6	4	3 – 50	6 – 60	299910 6
20	—		eShop		20	—	8	6	—	10 – 110	299910 4
25	—		eShop		25	—	8	6	—	15 – 220	299910 4

RAA 2×AA	RBL 2×BR	RBR 2×BL	RGE30° BL/R30°	RGE45° BL/R45°
-------------	-------------	-------------	-------------------	-------------------

- **Minimal pressure** reduces stress on the workpiece and machine.
- **Synchronising spindle** for easy adjustment of knurl carriers and centre heights.
 - 29 0020 – Working area can be extended by rotating the knurl carrier.
 - Exchangeable jaws (jaw set on request) for knurling up to the shoulder.

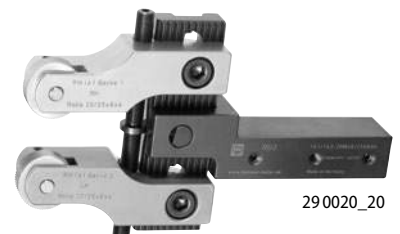
29 0015/0020 – **Modular design: Can be used as a right-hand or left-hand version.**

Note:

29 0020 – Use of knurl $\varnothing$ 25 mm extends the working range to 0 mm – 65 mm.



29 0018_12



29 0020_20

NEW											
Shank size	29H 29 0018	29H 29 0019	29H 29 0015	29H 29 0020	for knurl Ø d ₁		for knurl width w	for knurl bore Ø d ₂	Working range		Roller pin
	Knurl forming tool				29 0018 29 0019	29 0015 29 0020			29 0018 29 0019	29 0015 29 0020	
mm	right-hand	left-hand	Sliding head-stock lathe universal	universal	mm	mm	mm	mm	mm	mm	
10	eShop	eShop	(eShop)	—	15	10	4	4	0 – 15	0 – 12.5	299910 6
12	eShop	eShop	eShop	—	15	10	4	4	0 – 15	0 – 12.5	299910 6
16	eShop	eShop	(eShop)	—	15	10	4	4	0 – 15	0 – 12.5	299910 6
20	—	—	—	eShop	—	20; 25	8	6	—	3.5 – 65	299910 8
25	—	—	—	eShop	—	20; 25	8	6	—	3.5 – 65	299910 8



29

Knurl forming tool set



29 0025_20

Shank / insert size	mm	12	16	20	25
29H 29 0025 Knurl forming tool set		eShop	eShop	eShop	eShop
Content: 1 pc. each knurl forming tool No. 290000 and No. 290010		Size 12	Size 16	Size 20	Size 25
3 pc. each knurl No. 290161		—	Size 15×4/0.6; 15×4/0.8; 15×4/1.0	Size 20×8/0.8; 20×8/1.0; 20×8/1.5	Size 25×8/0.8; 25×8/1.0; 25×8/1.5
2 pcs. each knurl No. 290161		Size 10×4/0.5; 10×4/0.6; 10×4/0.8	—	—	—
1 pc. each knurl No. 290176 and No. 290181		Size 10×4/0.5; 10×4/0.6; 10×4/0.8	Size 15×4/0.6; 15×4/0.8; 15×4/1.0	Size 20×8/0.8; 20×8/1.0; 20×8/1.5	Size 25×8/0.8; 25×8/1.0; 25×8/1.5
1 pc. each knurl No. 290161		Size 15×4/0.5; 15×4/0.6; 15×4/0.8	—	—	—



ECO knurl forming tools

ECO knurl forming tool for 1 knurl



Used conventionally.

Note: Tip height must be adjusted.

29 0036

Shank size	29H 29 0036	for knurl Ø d ₁	for knurl width w	for knurl bore Ø d ₂	Working range	Roller pin
	ECO knurl forming tool					
mm	universal	mm	mm	mm	mm	
12	eShop	10; 15	4	4	3 – 50	299911 2
20	eShop	20; 25	8	6	8 – 200	299911 7

ECO knurl forming tool for 2 knurls



29 0041 – Can be used universally as right-hand or left-hand version.



29 0041

Shank size	29H 29 0039	29H 29 0041	for knurl Ø d ₁	for knurl width w	for knurl bore Ø d ₂	Working range	Roller pin
	ECO knurl forming tool						
mm	right-hand	universal	mm	mm	mm	mm	
12	eShop	—	15	4	4	6 – 60	299911 4
20	—	eShop	20	8	6	10 – 110	299911 3

ECO knurl forming tool set



29 0050

NEW

Shank size	mm	12	20
29H 29 0050 ECO knurl forming tool set		eShop	eShop
Content:			
1 pc. each eco knurl forming tool No. 290036 and No. 290039		Size 12	—
1 pc. each eco knurl forming tool No. 290036 and No. 290041		—	Size 20
3 pc. knurl No. 290161		Size 15×4/0.6	Size 20×8/0.8
2 pc. knurl No. 290161		Size 15×4/0.8	Size 20×8/1.0
1 pc. each knurl No. 290176 and No. 290181		Size 15×4/0.6; 15×4/0.8; 15×4/1.0	Size 20×8/0.8; 20×8/1.0; 20×8/1.2
2 pcs. roller pin No. 299911		Size 4	Size 3
1 pc. roller pin No. 299911		Size 2	Size 7

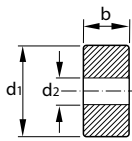


Knurls with chamfer for knurl forming

Wear-resistant powder metal (PM).

Note: Further sizes and profiles available on request.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
29 0161–29 0199	70	35		60	45	30								50	25		65		●	○	○		



Knurl $\varnothing d_1 \times$ knurl width b / pitch	29H 29 0161	29H 29 0176	29H 29 0181	29H 29 0186	29H 29 0191	29H 29 0196	29H 29 0199	Knurl bore $\varnothing d_2$
	Knurl PM							
mm	AA	BL 30°	BR 30°	BL 45°	BR 45°	GE 30°	GV 30°	mm
10×4/0,5	eShop	eShop	eShop	eShop	eShop	—	—	4
10×4/0,6	eShop	eShop	eShop	eShop	eShop	—	—	4
10×4/0,8	eShop	eShop	eShop	eShop	eShop	—	—	4
10×4/1,0	eShop	eShop	eShop	eShop	eShop	—	—	4
15×4/0,5	eShop	eShop	eShop	eShop	eShop	eShop	eShop	4
15×4/0,6	eShop	eShop	eShop	eShop	eShop	eShop	eShop	4
15×4/0,8	eShop	eShop	eShop	eShop	eShop	eShop	eShop	4
15×4/1,0	eShop	eShop	eShop	eShop	eShop	eShop	eShop	4
15×6/1,0	eShop	eShop	eShop	eShop	eShop	eShop	eShop	4
20×8/0,5	eShop	eShop	eShop	eShop	eShop	eShop	eShop	6
20×8/0,6	eShop	eShop	eShop	eShop	eShop	eShop	eShop	6
20×8/0,8	eShop	eShop	eShop	eShop	eShop	eShop	eShop	6
20×8/1,0	eShop	eShop	eShop	eShop	eShop	eShop	eShop	6
20×8/1,2	eShop	eShop	eShop	eShop	eShop	eShop	eShop	6
20×8/1,5	eShop	eShop	eShop	eShop	eShop	eShop	eShop	6
20×8/1,6	eShop	eShop	eShop	—	—	—	—	6
25×8/1,0	eShop	eShop	eShop	eShop	eShop	—	eShop	6

Knurl forming tools for applications up to the collar

Grub screws in the shank for clearance angle correction.
Carbide roller pin for increased wear resistance.

Knurl forming tool for 1 knurl

RAA
1×AA

Top face of the shank = tip height

29 0084 – **Modular design: Can be used universally as right-hand or left-hand version.**



29 0084

Shank size	29H 29 0080	29H 29 0084	for knurl Ø d ₁	for knurl width w	for knurl bore Ø d ₂	for knurled countersunk Ø d ₃	Working range	Closure stud	Disc
	Knurl forming tool								
mm	right-hand	universal	mm	mm	mm	mm	mm		
10	eShop	—	15	6	6	11	3 – 50	299925 1	299927 1
12	eShop	—	15	6	6	11	3 – 50	299925 1	299927 1
16	eShop	—	15	6	6	11	3 – 50	299925 1	299927 1
20	—	eShop	20	8	6	13	8 – 200	299925 2	299927 2
25	—	eShop	20	8	6	13	8 – 200	299925 2	299927 2

Knurl forming tool for 2 knurls

RAA
2×AA

29 0098 – Working area can be extended by rotating the knurl carrier.

29 0089/0090/0098 – **Modular design: Can be used universally as right-hand or left-hand version.**

29 0094/0098 – ■ **Minimal pressure** reduces stress on the workpiece and machine.

■ **Synchronising spindle** for easy adjustment of knurl carriers and centre heights.



29 0090



29 0098

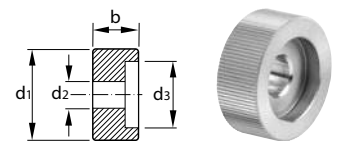
Shank size	29H 29 0089	29H 29 0090	for knurl Ø d ₁	for knurl width w	for knurl bore Ø d ₂	for knurled countersunk Ø d ₃	Working range	Closure stud	Disc
	Knurl forming tool								
mm	Sliding headstock lathe universal	universal	mm	mm	mm	mm	mm		
10	(eShop)	eShop	15	6	6	11	3 – 40	299925 1	299927 1
12	(eShop)	eShop	15	6	6	11	3 – 40	299925 1	299927 1
16	(eShop)	eShop	15	6	6	11	3 – 40	299925 1	299927 1
20	—	eShop	20	8	6	13	10 – 110	299925 2	299927 2
25	—	eShop	20	8	6	13	10 – 110	299925 2	299927 2

Shank size	29H 29 0094	29H 29 0098	for knurl Ø d ₁	for knurl width w	for knurl bore Ø d ₂	for knurled countersunk Ø d ₃	Working range	Closure stud	Disc
	Knurl forming tool								
mm	right-hand	universal	mm	mm	mm	mm	mm		
10	eShop	—	15	6	6	11	0 – 15	299925 1	299927 1
12	eShop	—	15	6	6	11	0 – 15	299925 1	299927 1
16	eShop	—	15	6	6	11	0 – 15	299925 1	299927 1
20	—	eShop	20	8	6	13	3.5 – 65	299925 2	299927 2
25	—	eShop	20	8	6	13	3.5 – 65	299925 2	299927 2

Knurls for knurl forming up to the collar

With 45° chamfer.
Wear-resistant powder metal (PM).

Note: Further sizes and profiles available on request.



Suitable for/ v _c [m/min]	Alu plastics 	Alu 	Alu cast > 10 % Si	 < 500 N	 < 750 N	 < 900 N	 < 1100 N	 < 1400 N	 < 55 HRC	 < 60 HRC	 < 65 HRC	 < 67 HRC	 < 70 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
29 0150	70	35		60	45	30								50	25		65		●	○	○		

Knurl Ø d ₁ × knurl width w / pitch		mm	15×6/0,6	15×6/0,8	15×6/1,0	15×6/1,2	15×6/1,5	20×8/0,6	20×8/0,8	20×8/1,0	20×8/1,2	20×8/1,5
29 0150	Knurl PM	AA	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
Knurl bore Ø d ₂		mm	6									
Knurled countersunk Ø d ₃		mm	11	11	11	11	11	13	13	13	13	13



Cut knurling tools

Modular design: Can be used universally as right-hand or left-hand version.

Carbide running sleeve for increased wear resistance.

Quick tool adjustment by using the adjustment spindle.

Cut knurling tool for 1 knurl

RAA 1×BR30°	RAA 1×BL30°	RBR30° 1×AA	RBL30° 1×AA	RBR45° 1×BL15°	RBL45° 1×BR15°
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Grub screw in the shank for clearance angle correction.

29 0200 Size 20; 25 – 3-point contact for exact axial positioning.

Radial and axial rotational registration for optimum tool guidance.



29 0200_12



29 0200_20

Shank size	NEW			for knurl $\varnothing d_1$	for knurl width w	for knurl bore $\varnothing d_2$	Working range	Carbide sleeve, cover disc, screw		
	29H	29H	29H							
	29 0197			29 0197	29 0198 29 0200	29 0197	29 0198 29 0200	29 0197	29 0198 29 0200	29 0200
	Cut knurling tool									
	sliding headstock lathe									
mm	universal	universal	universal	mm	mm	mm	mm	mm	mm	mm
10	(eShop)	(eShop)	eShop	10	15	3	4	6	8	0 – 15
12	(eShop)	(eShop)	eShop	10	15	3	4	6	8	0 – 15
16	(eShop)	(eShop)	eShop	10	15	3	4	6	8	0 – 15
20	–	–	eShop	–	25	–	6	–	8	–
25	–	–	eShop	–	25	–	6	–	8	–

Cut knurling tool for 2 knurls

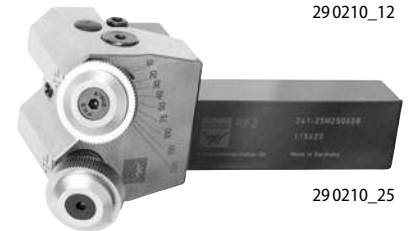
RGE30° 2×AA	RGE45° BL/R15°
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Advantage:

- Low vibration.
- Adjustment scale and synchronous adjustment spindle for adjusting the workpiece $\varnothing$.
- Reduced set-up times leading to reduced unit costs.
- Clearance angle correction of the knurls.
- Increased wear resistance due to specially hardened surface.
- For higher feed rates and cutting speeds.



29 0210_12



29 0210_25

Shank size	29H	29 0210	for knurl $\varnothing d_1$	for knurl width w	for knurl bore $\varnothing d_2$	Working range	Carbide sleeve, cover disc, screw
mm		universal	mm	mm	mm	mm	
10		eShop	15	4	8	3 – 50	299920 5
12		eShop	15	4	8	3 – 50	299920 5
16		eShop	15	4	8	3 – 50	299920 5
16X		eShop	25	6	8	10 – 250	299920 1
20		eShop	25	6	8	10 – 250	299920 1
25		eShop	25	6	8	10 – 250	299920 1

Cut knurling tool set

RAA 1×BR30°	RAA 1×BL30°	RBR30° 1×AA	RBL30° 1×AA	RBR45° 1×BL15°	RBL45° 1×BR15°	RGE30° 2×AA	RGE45° BL/R45°
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29 0219_12



29 0219_20

Shank size	mm	12	16	20	25
29H	29 0219	eShop	eShop	eShop	eShop
Content:		Size 12	Size 16	Size 20	Size 25
1 pc. each knurling tool No. 290200 and No. 290210		Size 15×4/0.5; 15×4/0.6; 15×4/0.8	Size 15×4/0.6; 15×4/0.8; 15×4/1.0	Size 25×6/0.8; 25×6/1.0; 25×6/1.5	Size 25×6/0.8; 25×6/1.0; 25×6/1.5
2 pc. each knurl No. 290261		Size 15×4/0.5; 15×4/0.6; 15×4/0.8	Size 15×4/0.6; 15×4/0.8; 15×4/1.0	Size 25×6/0.8; 25×6/1.0; 25×6/1.5	Size 25×6/0.8; 25×6/1.0; 25×6/1.5
1 pc. each knurl No. 290276 and No. 290281		Size 15×4/0.5; 15×4/0.6; 15×4/0.8	Size 15×4/0.6; 15×4/0.8; 15×4/1.0	Size 25×6/0.8; 25×6/1.0; 25×6/1.5	Size 25×6/0.8; 25×6/1.0; 25×6/1.5



29



ECO cut knurling tools

Grub screws in the shank for clearance angle correction.



29 0231_12



29 0231_20

ECO cut knurling tools for 1 knurl

RAA 1×BR30°	RAA 1×BL30°	RBR30° 1×AA	RBL30° 1×AA	RBR45° 1×BL15°	RBL45° 1×BR15°
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Shank size	29H	29 0231	for knurl $\varnothing d_1$	for knurl width w	for knurl bore $\varnothing d_2$	Working range	Carbide sleeve, cover disc, screw
		ECO cut knurling tool					
mm		right-hand	mm	mm	mm	mm	
12		eShop	15	4	8	3 – 50	299920 6
20		eShop	25	6	8	10 – 300	299920 7

ECO cut knurling tools for 2 knurls

RGE30° 2×AA	RGE45° BL/R15°
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29 0242 – **Modular design: Can be used universally as right-hand or left-hand version.**
Adjustment of the production $\varnothing$ using a scale.



29 0239_12



29 0242_20

Shank size	29H	29 0239	29H	29 0242	for knurl $\varnothing d_1$	for knurl width w	for knurl bore $\varnothing d_2$	Working range	Carbide sleeve, cover disc, screw
		ECO cut knurling tool							
mm		right-hand		universal	mm	mm	mm	mm	
12		eShop		—	15	4	8	3 – 50	299920 8
20		—		eShop	25	6	8	10 – 250	299920 9



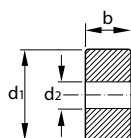
Knurls without chamfer for cut knurling

Wear-resistant powder metal (PM).

Note:

- Size 21.5×5×8 suitable for Quick tools.
- Further sizes available on request.

Suitable for/ v_c [m/min]	Alu plastics	Alu plastics	Alu cast > 10 % Si											INOX < 900 N	INOX > 900 N	Ti > 850 N	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	S	N	N					
29 0261–29 0281	160	110	110	110	85	65								60	35		120		●	○	○		



Knurl $\varnothing d_1 \times$ knurl width w / pitch	29H	29 0261	29H	29 0266	29H	29 0271	29H	29 0276	29H	29 0281	Knurl bore $\varnothing d_2$
		Knurl PM									
mm		AA		BL 15°		BR 15°		BL 30°		BR 30°	mm
10×3/0,5		(eShop)		(eShop)		(eShop)		(eShop)		eShop	6
10×3/0,6		(eShop)		(eShop)		(eShop)		(eShop)		eShop	6
10×3/0,8		(eShop)		(eShop)		(eShop)		(eShop)		eShop	6
10×3/1,0		(eShop)		(eShop)		(eShop)		(eShop)		eShop	6
15×4/0,5		eShop		eShop		eShop		eShop		eShop	8
15×4/0,6		eShop		eShop		eShop		eShop		eShop	8
15×4/0,8		eShop		eShop		eShop		eShop		eShop	8
15×4/1,0		eShop		eShop		eShop		eShop		eShop	8
25×6/0,5		eShop		eShop		eShop		eShop		eShop	8
25×6/0,6		eShop		eShop		eShop		eShop		eShop	8
25×6/0,8		eShop		eShop		eShop		eShop		eShop	8
25×6/1,0		eShop		eShop		eShop		eShop		eShop	8
25×6/1,2		eShop		eShop		eShop		eShop		eShop	8
25×6/1,5		eShop		eShop		eShop		eShop		eShop	8
21,5×5/1,0		eShop		eShop		eShop		eShop		eShop	8

Roller burnishing tools

Advantage: Surface quality of up to Rz 2 µm possible.

Application: For machining materials up to 45 HRC. Ideal for machining the surfaces of complex, continuous contours.

Note: For detailed application recommendations please see the instruction handbook supplied.

Holder for burnishing roller

29 1412 – Fixed tool head (grub screw in the shank for clearance angle correction).

29 1415–1417 – Swivelling tool head (adjustment range ± 90°).

Application:

29 1412 – For roller-burnishing of **uninterrupted contours** (convex, concave, cylindrical and conical).

29 1415–1417 – For roller-burnishing of **uninterrupted contours** (convex, concave, cylindrical and conical) and flat faces.
Suitable even for applications up to the collar.

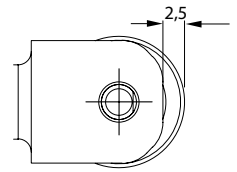
Supplied with:

Size 10-16 – Shank size 10 including shank adaptor 12 mm × 12 mm and 16 mm × 16 mm.

Size 16-25 – Shank size 16 including shank adaptor 20 mm × 20 mm and 25 mm × 25 mm.

Attention: Burnishing rollers must be ordered separately!

Note: Check potential interference contours (x dimension of the roller = 2.5 mm).



Shank size	29M	29 1412	29M	29 1415	29M	29 1416	29M	29 1417
		Holder for burnishing roller						
		Fixed head universal		universal		Swivelling head right-hand		left-hand
10-16		eShop		—		eShop		eShop
16-25		(eShop)		eShop		—		—

Burnishing rollers

Advantage: Inexpensive alternative to diamond burnishing up to a surface quality of Rz < 2 µm.

Note: Use the largest possible radius.

Tip radius	mm	0,4	0,6	1
29M 29 1419	Burnishing roller	eShop	eShop	eShop



Smoothing tool with diamond smoothing tips

Technology

The pressure of the burnishing roller produces a material flow from the near-surface material layer which was produced using machining. The roughness peaks are levelled and the roughness reduced. This creates a smooth and resistant surface.

Impressive advantages

- Complete machining in a single clamping
- Cost-effective (compared to diamond burnishing)
- Surface quality of up to Rz 2 µm possible.
- Adjustable (head or clearance angle), which enables different contact points between burnishing roller and workpiece.

Impressive advantages

- Suitable for materials up to a tensile strength of 1500 N/mm² (approx. 45 HRC).
- Suitable only under restricted conditions (not recommended) for hardened and high-strength materials.
- The recommended maximum workpiece diameter is approx. 4 × Ø of roller = 60 mm.
- Pre-turning surface of at least Rz = 10 µm (Ra = 1).
- Workpiece radial run-out < 0.03 mm.
- Infeed always in the workpiece.
- The selected curvature of the roller should be greater than the radius of the pre-turning plate.

	Alu plastics	Alu cast	Alu cast > 10 % Si	Y	Y	Y	Y	Y	Y	Y	INOX	INOX	Ti	GG(G)	CuZn		
	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K		
ISO code																	
a _s mm	0.005 – 0.02			0.006 – 0.04					0.01 – 0.08			0.01 – 0.1	0.01 – 0.1	0.05 – 0.2	0.005 – 0.02	●	●
f mm/rev	0.03 – 0.1			0.02 – 0.06					0.02 – 0.1			0.02 – 0.06	0.02 – 0.06	0.05 – 0.1	0.02 – 0.06	●	●
V _c m/min	120 – 140			110 – 140					100 – 130			100 – 130	100 – 130	80 – 120	100 – 130	●	●

Diamond burnishing tools

Advantage: Surface quality $R_z < 1 \mu\text{m}$ possible.

Application: For machining materials up to 65 HRC.
Ideal for machining the surfaces of complex, continuous contours.

Note: For detailed application recommendations please see the instruction handbook supplied.

Holder for diamond burnishing tips

29 1401 – Fixed tool head (grub screw in the shank for clearance angle correction).

29 1405–1407 – Swivelling tool head (adjustment range $\pm 90^\circ$).

Application:

29 1401 – For burnishing of **uninterrupted contours** (convex, concave, cylindrical, conical).

29 1405–1407 – For burnishing of **uninterrupted contours** (convex, concave, cylindrical, conical) and flat faces. Suitable even for applications up to the collar.

Supplied with:

Size 10-16 – Shank size 10 including shank adaptor 12 mm $\times$ 12 mm and 16 mm $\times$ 16 mm.

Size 16-25 – Shank size 16 including shank adaptor 20 mm $\times$ 20 mm and 25 mm $\times$ 25 mm.

Attention: Diamond burnishing tips must be ordered separately!



29 1405

Shank size	29M	29 1401	29M	29 1405	29M	29 1406	29M	29 1407
	Holder for diamond burnishing tips							
		Universal fixed head		Universal swivelling head		Swivelling head right		Swivelling head left
10-16		(eShop)		–		eShop		(eShop)
16-25		–		(eShop)		–		–

Diamond burnishing tips

Advantage: Thanks to indexing there are 8 possibilities for using the diamond burnishing tips.

Note: Use the largest possible radius.



29 1410

Tip radius	mm	0,2	0,4	0,6	0,8	1	2
		(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)

29M	29 1410	Diamond burnishing tips					
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Burnishing tool with diamond burnishing tips

Technology

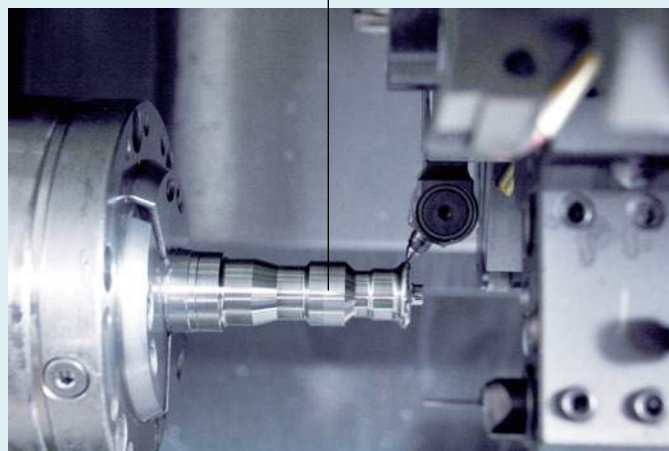
The pressure of the diamond burnishing tip produces a material flow from the near-surface material layer which was produced using machining. The roughness peaks are levelled and the roughness reduced. This creates a smooth and resistant surface.

Impressive advantages

- Smoothing of extremely hard materials up to 65 HRC with surface quality $R_z < 1 \mu\text{m}$ possible.
- Simple and flexible application.
Different shank sizes using adapters.
- 8 possibilities for using diamond tip.
Easy change of position by means of indexing.

Burnished with diamond

$R_z = 0.4 \mu\text{m}$



Standard application values

The technology values for the burnishing process are based on the finishing process, which was used to pre-machine the workpiece.

	Alu plastics	Alu cast > 10 % Si	Alu < 500 N	Alu < 750 N	Alu < 900 N	Alu < 1100 N	Alu < 1400 N	Alu < 55 HRC	Alu < 60 HRC	Alu < 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn		
ISO code	N	N	N	P	P	P	P	P	H	H	H	M	M	S	K		
a_r mm	0.005 – 0.02			0.006 – 0.04			0.01 – 0.08			0.01 – 0.1			0.01 – 0.1	0.05 – 0.2	0.005 – 0.02	●	●
f mm/rev	0.03 – 0.1			0.02 – 0.06			0.02 – 0.1			0.02 – 0.06			0.02 – 0.06	0.05 – 0.1	0.02 – 0.06	●	●
V_c m/min	120 – 140			110 – 140			100 – 130			100 – 130			100 – 130	80 – 120	100 – 130	●	●



ECOROLL

Smooth rolling tool, single roller

For use on CNC and conventional lathes.

With symmetrical structure – can be used universally as right-hand or left-hand version.

Advantage: Surface quality $R_z < 1 \mu\text{m}$ possible.
Feed rates up to 1 mm/rev possible (external machining).

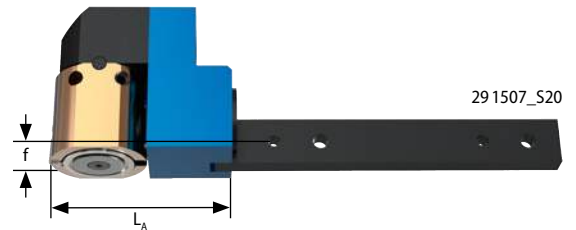
Application: For mechanical surface finishing.
For machining all metallic materials up to a tensile strength of 1400 N/mm² and a hardness of up to 45 HRC.

Note:

- Other shank connections on request.
- Detailed technology recommendations can be found in the instruction manual.

For cylindrical external or flat faces (recommended Ø range 5 mm – 50 mm)

Application: For use on sliding headstock lathes.



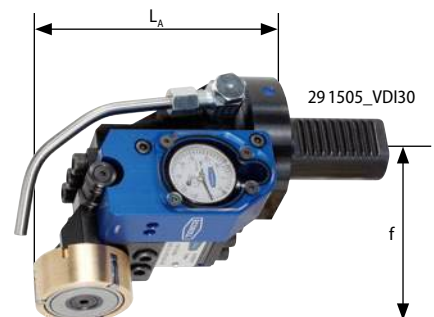
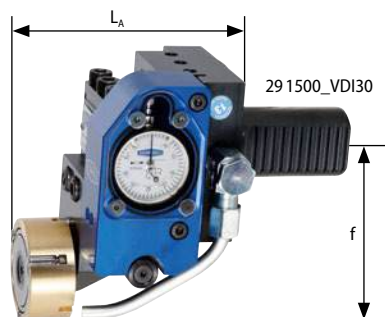
Shank mounting type		S10	S12	S16	S20
29F 29 1507	Smooth rolling tool EG3T-3 universal	(eShop)	(eShop)	(eShop)	(eShop)
L_A	mm	110			
f	mm	5	6	8	10
maximum rolling force	kN	0.6			
Roll Ø	mm	3			
Shank square	mm	10×10	12×12	16×16	20×20
Suitable for: Ø range (recommended)		5 mm – 50 mm			

For cylindrical external or flat faces (recommended Ø range 10 mm – 100 mm)

Advantage: Consistent results due to continuous measurement of the rolling force.

Supplied with: Two spare rolls built in the cage.

Note: Tool tray for the respective machining surface depends on the type of turret (star/disc).



Shank mounting type		S20	S25	VDI20	VDI25	VDI30	VDI40
29F 29 1500	Smooth rolling tool EG5 universal	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)
29F 29 1505		–	–	(eShop)	(eShop)	(eShop)	(eShop)
L_A (29 1500)	mm	69	69	83	83	83	83
L_A (29 1505)	mm	–	–	121	121	121	121
f (29 1500)	mm	93.1	102.1	78	78	78	78
f (29 1505)	mm	–	–	80	80	80	80
maximum rolling force	kN	3					
Roll Ø	mm	5					
Shank square	mm	20×20	25×25	–	–	–	–
Suitable for: Ø range (recommended)		10 mm – 100 mm					

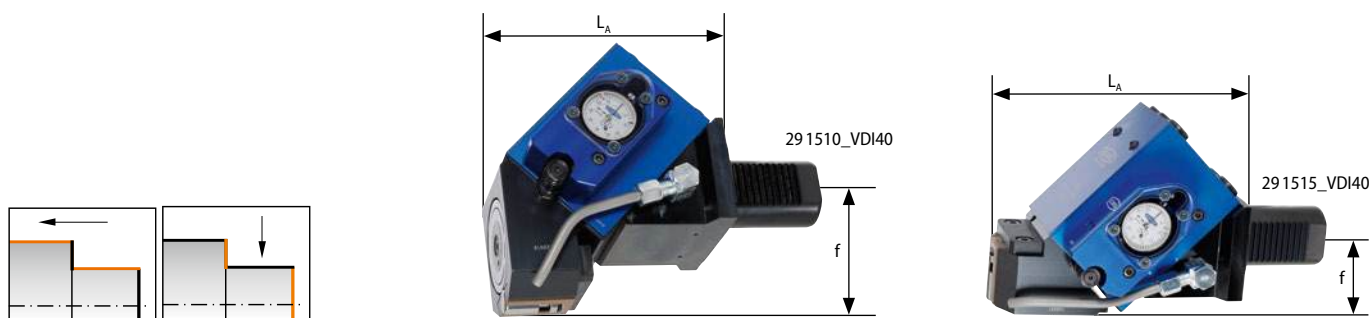


29

For cylindrical external or flat faces (recommended from Ø 50 mm)

Advantage: Consistent results due to continuous measurement of the rolling force.

Note: Tool tray for the respective machining surface depends on the type of turret (star/disc).



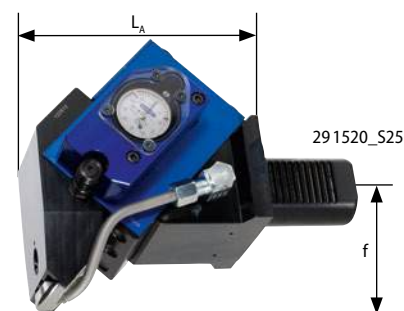
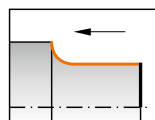
Shank mounting type		S25	S32	VDI40	VDI50	PSC63	PSC80
29F 29 1510	Smooth rolling tool EG14	(eShop)	(eShop)	(eShop)	(eShop)	—	—
29F 29 1515	universal	—	—	(eShop)	(eShop)	(eShop)	(eShop)
L _A (29 1510)	mm	132	132	131	131	—	—
L _A (29 1515)	mm	—	—	158.1	158.1	196	196
f (29 1510)	mm	103.6	103.6	71.3	71.3	—	—
f (29 1515)	mm	—	—	44	44	44	44
maximum rolling force	kN	8					
Roll Ø	mm	14					
Shank square	mm	25×25	32×32	—	—	—	—
Suitable for:		from 50 mm					
Ø range (recommended)							

For external surfaces with transition radii

Advantage: Consistent results due to continuous measurement of the rolling force.

Recommendation: For external surfaces with subsequent radius up to plane surface.

Note: Roller radius = 2.5 mm. Machinable workpiece radii from 4 mm to 12 mm.



Shank mounting type		S25	S32	VDI40	VDI50	PSC63	PSC80
29F 29 1520	Smooth rolling tool EG45-40M	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)
L _A	mm	130	130	129	129	151	166.3
f	mm	101.1	101.1	69	69	69	69
maximum rolling force	kN	4					
Roll Ø	mm	40					
Shank square	mm	25×25	32×32	—	—	—	—
Suitable for:		from 35 mm					
Ø range (recommended)							

For external surfaces and holes

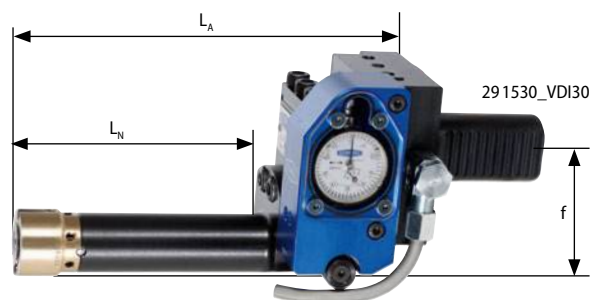
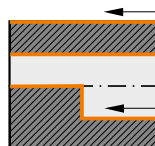
High flexibility due to external and internal use.

Independent of diameter (within the recommended range) for internal machining.

Advantage: Consistent results due to continuous measurement of the rolling force.

Application: For external Ø from 10 mm and internal Ø from 32 mm.

Supplied with: Two spare rolls built in the cage.



Shank mounting type		S20	S25	VDI20	VDI25	VDI30	VDI40
29F 29 1530	Smooth rolling tool EGI5-32AI	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)	(eShop)
L _A	mm	154	154	168	168	168	168
f	mm	73.2	82.2	58	58	58	58
L _N	mm	100					
maximum rolling force	kN	3					
Roll Ø	mm	5					
Shank square	mm	20×20	25×25	—	—	—	—
Suitable for:		10 mm – 100 mm					
Ø range outside (recommended)							
Ø range inside (recommended)		32 mm – 150 mm					



Smooth rolling tool, multi-roller

For use on CNC and conventional lathes, milling and drilling machines.
Stepless adjustment in μm (adjustment range from -0.05 mm to $+0.1\text{ mm}$).

Advantage: **Specially for production use.** Maximum productivity due to **feed rates** from 0.05 mm – 0.3 mm per roll .

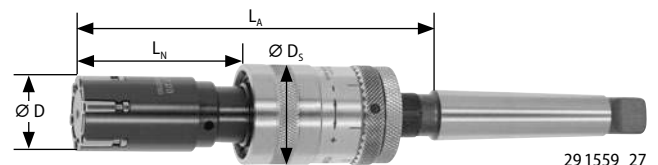
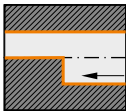
Surface quality $R_z < 1\text{ }\mu\text{m}$ possible.

Automatic release during tool withdrawal avoids damage to smooth rolled surface.

Application:

- For mechanical surface finishing.
- For machining all metallic materials up to a tensile strength of 1400 N/mm^2 and a hardness of up to 45 HRC .
- Clockwise machining.
- Up to tolerance class IT8.
- For holes up to $\varnothing 49\text{ mm}$.

Note: From $\varnothing 10\text{ mm}$ optionally with internal cooling.



29 1559_27

Ø D	29F 29 1550	29F 29 1553	29F 29 1556	29F 29 1559	29F 29 1562	L _A	L _N	Adjustment range	Ø D _s	Number of rolls
	Smooth rolling tool G									
	Parallel shank Ø 16 mm	Parallel shank Ø 20 mm	Parallel shank Ø 25 mm	MT2	MT3					
mm						mm	mm	mm	mm	
6	(eShop)	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	3
7	(eShop)	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	3
8	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	4
9	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	4
10	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	4
11	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
12	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
13	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
14	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
15	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
16	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
17	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
18	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
19	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
20	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
21	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
22	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
23	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
24	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	5
25	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	6
26	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	6
27	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	6
28	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	6
29	—	(eShop)	—	(eShop)	—	128	50	-0.05 / +0.1	35	6
30	—	—	(eShop)	(eShop)	—	128	50	-0.05 / +0.1	35	6
31	—	—	(eShop)	(eShop)	—	128	50	-0.05 / +0.1	35	6
32	—	—	(eShop)	(eShop)	—	128	50	-0.05 / +0.1	35	6
33	—	—	(eShop)	—	(eShop)	153	75	-0.05 / +0.1	35	6
34	—	—	(eShop)	—	(eShop)	153	75	-0.05 / +0.1	35	6
35	—	—	(eShop)	—	(eShop)	153	75	-0.05 / +0.1	35	6
36	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	6
37	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	6
38	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
39	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
40	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
41	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
42	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
43	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
44	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
45	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
46	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
47	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
48	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8
49	—	—	(eShop)	—	(eShop)	163	162	-0.05 / +0.1	35	8



29

Marking tool for marking roller No. 43

Return spring system with replaceable segments. Flexible and with adaptable shank.

Advantage: Marking up to the collar is possible.

Recommendation: Optionally, item No. 291990 Box can be ordered for the secure storage of interchangeable segments/character sets.

Note: The maximum number depends on the respective character width.
Marking roller with Ø 30mm: Fitting at least 17 segments possible.
Marking roller with Ø 50mm: Fitting at least 29 segments possible.

Marking tool set

Suitable for:

29 1920/1925 – Interchangeable segments No. 291950 – 291952 and character sets No. 291940 – 291942.

29 1930/1935 – Interchangeable segments No. 291954 – 291956 and character sets No. 291945 – 291947.

Supplied with:

29 1920/1925 – Marking tool with shank size 8, shank adapter for shank sizes 10, 12 and 16, start segment and end segment.

29 1930/1935 – Marking tool with shank size 16, shank adapter for shank sizes 20 and 25, start segment and end segment.

Attention: Check that the combination of tools and segments in correct.

Note: Range stock parts and for further versions available on request.

Shank size	29H 29 1920	29H 29 1925	29H 29 1930	29H 29 1935	Screw
	Marking tool set				
mm	right-hand	left-hand	right-hand	left-hand	
8-16	(eShop)	(eShop)	–	–	299923 3
16-25	–	–	(eShop)	(eShop)	299923 2
Labelling rollers Ø mm	30	30	50	50	



29 1930

Interchangeable segments

Suitable for:

29 1950/1952 – Marking tool No. 291920 and 291925.

29 1954/1956 – Marking tool No. 291930 and 291935.

Attention: Observe assignment between tools and segments.



29 1952_G



29 1956_1

Symbol	29H 29 1950	29H 29 1952	29H 29 1954	29H 29 1956
	Character segment			
	Character height 2 mm	Character height 3 mm	Character height 2 mm	Character height 3 mm
A	(eShop)	(eShop)	(eShop)	(eShop)
B	(eShop)	(eShop)	(eShop)	(eShop)
C	(eShop)	(eShop)	(eShop)	(eShop)
D	(eShop)	(eShop)	(eShop)	(eShop)
E	(eShop)	(eShop)	(eShop)	(eShop)
F	(eShop)	(eShop)	(eShop)	(eShop)
G	(eShop)	(eShop)	(eShop)	(eShop)
H	(eShop)	(eShop)	(eShop)	(eShop)
I	(eShop)	(eShop)	(eShop)	(eShop)
J	(eShop)	(eShop)	(eShop)	(eShop)
K	(eShop)	(eShop)	(eShop)	(eShop)
L	(eShop)	(eShop)	(eShop)	(eShop)
M	(eShop)	(eShop)	(eShop)	(eShop)
N	(eShop)	(eShop)	(eShop)	(eShop)
O	(eShop)	(eShop)	(eShop)	(eShop)
P	(eShop)	(eShop)	(eShop)	(eShop)
Q	(eShop)	(eShop)	(eShop)	(eShop)
R	(eShop)	(eShop)	(eShop)	(eShop)
S	(eShop)	(eShop)	(eShop)	(eShop)
T	(eShop)	(eShop)	(eShop)	(eShop)
Labelling rollers Ø mm	30	30	50	50

Symbol	29H 29 1950	29H 29 1952	29H 29 1954	29H 29 1956
	Character segment			
	Character height 2 mm	Character height 3 mm	Character height 2 mm	Character height 3 mm
U	(eShop)	(eShop)	(eShop)	(eShop)
V	(eShop)	(eShop)	(eShop)	(eShop)
W	(eShop)	(eShop)	(eShop)	(eShop)
X	(eShop)	(eShop)	(eShop)	(eShop)
Y	(eShop)	(eShop)	(eShop)	(eShop)
Z	(eShop)	(eShop)	(eShop)	(eShop)
0	(eShop)	(eShop)	(eShop)	(eShop)
1	(eShop)	(eShop)	(eShop)	(eShop)
2	(eShop)	(eShop)	(eShop)	(eShop)
3	(eShop)	(eShop)	(eShop)	(eShop)
4	(eShop)	(eShop)	(eShop)	(eShop)
5	(eShop)	(eShop)	(eShop)	(eShop)
6	(eShop)	(eShop)	(eShop)	(eShop)
7	(eShop)	(eShop)	(eShop)	(eShop)
8	(eShop)	(eShop)	(eShop)	(eShop)
9	(eShop)	(eShop)	(eShop)	(eShop)
.	(eShop)	(eShop)	(eShop)	(eShop)
-	(eShop)	(eShop)	(eShop)	(eShop)
/	(eShop)	(eShop)	(eShop)	(eShop)
Labelling rollers Ø mm	30	30	50	50

Character sets

Suitable for:

29 1940/1942 – Marking tool No. 291920 and 291925.

29 1945/1947 – Marking tool No. 291930 and 291935.

Attention: Observe assignment between tools and segments.

Character height	29H 29 1940	29H 29 1942	29H 29 1945	29H 29 1947	Content: Character segments	Content: Character segments
	Set of letters	Set of numbers	Set of letters	Set of numbers		
mm	A – Z	0 – 9	A – Z	0 – 9	291940	291945
2	(eShop)	(eShop)	(eShop)	(eShop)	291942	291947
3	(eShop)	(eShop)	(eShop)	(eShop)	291950	291954
Labelling rollers Ø mm	30	30	50	50	291952	291956

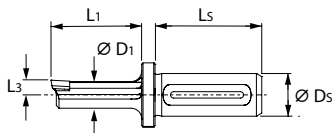


Garant Keyway broaching toolholder

Attention: Always use the minimum pre-drill $\varnothing$ to match the slot width (e.g. for slot width 14 mm, minimum pre-drill $\varnothing = 38.22$ mm).

- Note:**
- Individual holder sizes are for different slot widths. In such cases, where possible, always use the optimum combination of holder and cutting insert (identical size) for maximum stability.
 - For lathes without Y-axis, please use eccentric bush No. 290391– 290393 for exact setting of the Y-coordinate.
 - For machining centres, use the alignment aid No. 290397 and a dial indicator to check the spindle orientation.

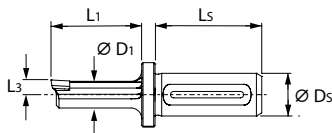
Toolholder, long



290350

from slot width m	29K 29 0350	29K 29 0353	suitable for slot width m	L ₁	$\varnothing D_1$	L ₃	Min. pre-drilling - $\varnothing D_{min}$	Screw
Keyway broaching toolholder, long								
mm	$\varnothing D_s$ 25 mm	$\varnothing D_s$ 32 mm	mm	mm	mm	mm	mm	
2	eShop	eShop	2	34.5	6.5	3.65	7.03	290399 1
3	eShop	eShop	3	40	7.8	4.2	8.36	290399 1
4	eShop	eShop	4; 5	56	10	5.35	10.71; 10.91	290399 1
5	eShop	eShop	5	66	12	6.35	12.82	290399 1
6	eShop	eShop	6; 8	81	16	9	17.49; 17.85	290399 2
8	eShop	eShop	8	100	20	11	21.7	290399 2
10	eShop	eShop	10; 12	126	25	14	27.37; 27.73	290399 3
12	eShop	eShop	12	161	30	16.5	32.56	290399 3
14	eShop	eShop	14; 16	180	35	19.5	38.22; 38.58	290399 3
18	—	eShop	18; 20; 22; 25	200	40	23	44.7; 45.08; 45.5; 46.18	290399 4
L ₅ mm	90	100						

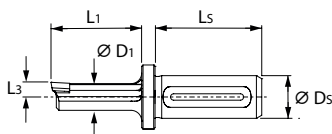
Toolholder, standard



290355

from slot width m	29K 29 0356	29K 29 0354	29K 29 0355	29K 29 0358	suitable for slot width m	L ₁	$\varnothing D_1$	L ₃	Min. pre-drilling - $\varnothing D_{min}$	Screw
Standard keyway broaching toolholder										
mm	$\varnothing D_s$ 16 mm	$\varnothing D_s$ 20 mm	$\varnothing D_s$ 25 mm	$\varnothing D_s$ 32 mm	mm	mm	mm	mm	mm	
2	eShop	eShop	eShop	eShop	2	25	6.5	3.65	7.03	290399 1
3	eShop	eShop	eShop	eShop	3	30	7.8	4.2	8.36	290399 1
4	eShop	eShop	eShop	eShop	4; 5	40	10	5.35	10.71; 10.91	290399 1
5	eShop	eShop	eShop	eShop	5	46	12	6.35	12.82	290399 1
6	eShop	eShop	eShop	eShop	6; 8	56	16	9	17.49; 17.85	290399 2
8	—	eShop	eShop	eShop	8	68	20	11	21.7	290399 2
10	—	—	eShop	eShop	10; 12	86	25	14	27.37; 27.73	290399 3
12	—	—	eShop	eShop	12	104	30	16.5	32.56	290399 3
14	—	—	eShop	eShop	14; 16	126	35	19.5	38.22; 38.58	290399 3
18	—	—	—	eShop	18; 20; 22; 25	140	40	23	44.7; 45.08; 45.5; 46.18	290399 4
L ₅ mm	40	50	90	100						

Toolholder, short



290359

from slot width m	29K 29 0357	29K 29 0359	suitable for slot width m	L ₁	$\varnothing D_1$	L ₃	Min. pre-drilling - $\varnothing D_{min}$	Screw
Short keyway broaching toolholder								
mm	$\varnothing D_s$ 16 mm	$\varnothing D_s$ 20 mm	mm	mm	mm	mm	mm	
2	eShop	eShop	2	17.5	6.5	3.65	7.03	290399 1
3	eShop	eShop	3	21	7.8	4.2	8.36	290399 1
4	eShop	eShop	4; 5	28	10	5.35	10.71; 10.91	290399 1
5	eShop	eShop	5	33	12	6.35	12.82	290399 1
6	eShop	eShop	6; 8	39	16	9	17.49; 17.85	290399 2
8	—	eShop	8	48	20	11	21.7	290399 2
L ₅ mm	40	50						



29

Garant Cutting inserts for keyway broaching toolholder

With TiN coating.

Suitable for regrinding.

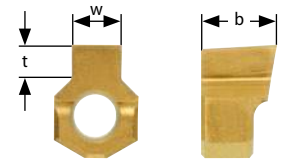
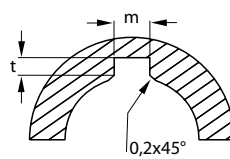
Application: For producing slots according to DIN 6885, DIN 138 and factory standards. For slot widths with tolerance JS9, use cutter inserts with tolerance H7.

Note: ■ Special sizes (slot widths) available on request.
■ Detailed application values can be found in our application ToolScout.

Suitable for/ v_c [m/min]	Alu plastics	Alu cast	Alu cast > 10 % Si											INOX	INOX	Ti	GG(G)	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	P	H	H	H	H	M	M	S	K	N	N					
29 0360–29 0379	●	●	●	●	●	●	●	○						●	○	○	●	●	○	●	●			

Cutting insert with chamfer

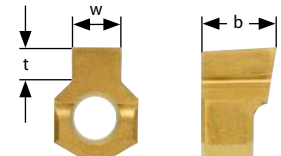
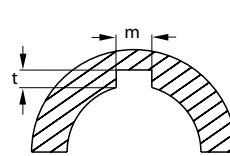
Note: From slot width 16 mm it is essential to perform two passes. The first pass must be performed for approx. half the slot width (e.g. 10 mm for a desired slot width of 18 mm). For the first pass it is recommended that a cutter insert without chamfer (290370 – 290379) is used, as this means greater slot depths are possible.



for slot width m	29L 29 0360	29L 29 0363	Blade width w		Groove depth t	Tip thickness b
	Slot cutting insert with chamfer		29 0360	29 0363		
mm	P9 TiN	H7 TiN	mm	mm	mm	mm
2	eShop	eShop	1.994	2.01	1.09	6.5
3	eShop	eShop	2.994	3.01	1.42	6.5
4	eShop	eShop	3.988	4.012	2.07	7
5	eShop	eShop	4.988	5.012	2.74	7
6	eShop	eShop	5.988	6.012	3	9
8	eShop	eShop	7.985	8.015	3.78	9
10	eShop	eShop	9.985	10.015	3.88	14
12	eShop	eShop	11.982	12.018	3.89	14
14	eShop	eShop	13.982	14.018	4.71	14
16	eShop	eShop	15.982	16.018	5.53	14
18	eShop	eShop	17.982	18.018	5.67	18
20	eShop	eShop	19.978	20.021	6.29	18
22	eShop	eShop	21.978	22.021	6.79	18
25	eShop	eShop	24.978	25.021	7.02	18
Chamfer	0.2 mm×45°		0.2 mm×45°			

Cutting insert without chamfer

Note: From slot width 16 mm it is essential to perform two passes. The first pass must be performed for approx. half the slot width (e.g. 10 mm for a desired slot width of 18 mm).



for slot width m	29L 29 0370	29L 29 0373	29L 29 0376	29L 29 0379	Blade width w				Groove depth t	Tip thickness b
	Slot cutting insert without chamfer				29 0370	29 0373	29 0376	29 0379		
mm	P9 TiN	H7 TiN	D10 TiN	C11 TiN	mm	mm	mm	mm	mm	mm
2	eShop	eShop	eShop	eShop	1.994	2.01	2.06	2.12	1.3	6.5
3	eShop	eShop	eShop	eShop	2.994	3.01	3.06	3.12	2	6.5
4	eShop	eShop	eShop	eShop	3.988	4.012	4.078	4.145	2.6	7
5	eShop	eShop	eShop	eShop	4.988	5.012	5.078	5.145	3	7
6	eShop	eShop	eShop	eShop	5.988	6.012	6.078	6.145	4	9
8	eShop	eShop	eShop	eShop	7.985	8.015	8.098	8.17	4.5	9
10	eShop	eShop	eShop	eShop	9.985	10.015	10.098	10.17	6	14
12	eShop	eShop	eShop	eShop	11.982	12.018	12.12	12.205	6.5	14
14	eShop	eShop	eShop	eShop	13.982	14.018	14.12	14.205	7	14
16	eShop	eShop	eShop	eShop	15.982	16.018	16.12	16.205	8	14
18	eShop	eShop	eShop	eShop	17.982	18.018	18.12	18.205	9	18
20	eShop	eShop	eShop	eShop	19.978	20.021	20.149	20.24	10	18
22	eShop	eShop	eShop	eShop	21.978	22.021	22.149	22.24	11	18
25	eShop	eShop	eShop	eShop	24.978	25.021	25.149	25.24	12	18



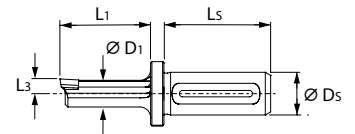
Garant Profile slotting toolholders

Note:

- For lathes without Y-axis, please use eccentric bush No. 290391 – 290393 for exact setting of the Y-coordinate.
- For machining centres, use the pull-up aid No. 290397 and a dial indicator to check the spindle orientation.



290334



from square	29K 290330	29K 290332	29K 290334	suitable for square drive	L ₁	Ø D ₁	L ₃	Min. pre-drilling - Ø D _{min}	Screw
Profile slotting toolholder for square cutting inserts									
mm	Ø D _s 20 mm	Ø D _s 25 mm	Ø D _s 32 mm	mm	mm	mm	mm	mm	
8	eShop	eShop	eShop	8 – 10	30	8	4	8	290399 1
10	eShop	eShop	eShop	10 – 13	40	10	4.8	9.1	290399 1
14	eShop	eShop	eShop	14 – 16	50	13	7	13	290399 1
17	eShop	eShop	eShop	17 – 19	52	16	8.5	16	290399 3
19	—	eShop	eShop	19 – 27	89	18	10.25	18.975	290399 3
27	—	eShop	eShop	27 – 37	100	25	14.5	27	290399 3
38	—	—	eShop	38 – 50	140	35	20.5	38	290399 3
L ₅ mm	50	90	100						

from hexagon	29K 290340	29K 290342	29K 290344	suitable for hexagon drive	L ₁	Ø D ₁	L ₃	Min. pre-drilling - Ø D _{min}	Screw
Profile slotting toolholder for hexagon cutting inserts									
mm	Ø D _s 20 mm	Ø D _s 25 mm	Ø D _s 32 mm	mm	mm	mm	mm	mm	
9	eShop	eShop	eShop	9 – 11	30	8	4.5	8.5	290399 1
11	eShop	eShop	eShop	11 – 17	40	10	5.5	10.5	290399 1
17	eShop	eShop	eShop	17 – 28	56	15	8.5	16	290399 2
28	—	eShop	eShop	28 – 37	89	25	14	26.5	290399 3
37	—	eShop	eShop	37 – 45	126	35	19.5	37	290399 3
45	—	—	eShop	45 – 70	140	40	23	43	290399 4
L ₅ mm	50	90	100						

Garant Cutting inserts for profile slotting toolholders

With TiN coating.

Suitable for regrinding.

Suitable for:

290336 – Profile slotting toolholders No. 290330 – 290334.

290346 – Profile slotting toolholders No. 290340 – 290344.

Note:

- Profile cutting inserts can be used for a square or hexagonal range (see product table).
- Detailed application values can be found in our application ToolScout.

ISO code	Alu plastics	Alu cast > 10 % Si	Alu cast < 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	INOX < 900 N	INOX > 900 N	Ti > 850 N	GG(G)	CuZn	Graphite GRP CRP	Oil	Water	Chips	Swarf
290336/0346	N	N	N	P	P	P	P	P	H	H	H	H	M	M	S	K	N	N				



290336



290346

from square	29L 29 0336	suitable for square drive	from hexagon	29L 29 0346	suitable for hexagon drive
Profile cutting insert			Profile cutting insert		
Square			Hexagon		
mm	TiN	mm	mm	TiN	mm
8	eShop	8 – 10	9	eShop	9 – 11
10	eShop	10 – 13	11	eShop	11 – 17
14	eShop	14 – 16	17	eShop	17 – 28
17	eShop	17 – 19	28	eShop	28 – 37
19	eShop	19 – 27	37	eShop	37 – 45
27	eShop	27 – 37	45	eShop	45 – 70
38	eShop	38 – 50			



29

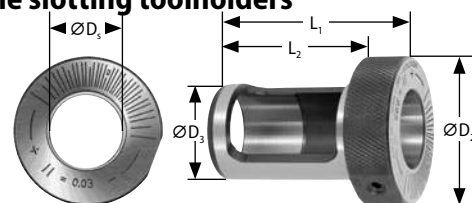
Garant Eccentric bush for keyway broaching toolholders and profile slotting toolholders

With adjustment range from a maximum of ± 0.5 mm.

A graduation on the scale corresponds to 0.03 mm.

Suitable for: Keyway broaching and profile slotting toolholders No. 290330 – 290359.

Application: For fine adjustment of groove slotting toolholders and profile slotting toolholders on lathes without a Y axis.

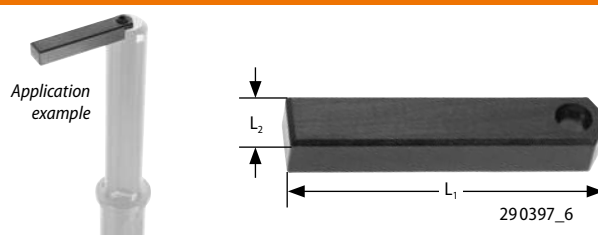


$\varnothing D_3$ H7	mm	25	32	32L	40	40L	50	50L	60	60L	for $\varnothing D_3$ mm
29K 29 0391	Eccentric bush	eShop	eShop	eShop	–	–	–	–	–	–	20
29K 29 0392		–	eShop	eShop	eShop	–	–	–	–	–	25
29K 29 0393		–	–	–	eShop	eShop	eShop	eShop	eShop	eShop	32
$\varnothing D_2$	mm	40	48	48	55	55	65	65	80	80	
L_1 (29 0391, 29 0393)	mm	50	50	70	80	95	95	115	105	115	
L_2 (29 0392)	mm	–	65	85	80	–	–	–	–	–	
L_1 (29 0391, 29 0393)	mm	40	40	60	65	80	80	100	80	100	
L_2 (29 0392)	mm	–	50	70	65	–	–	–	–	–	

Garant Alignment aid for machining centres

Suitable for: Keyway broaching and profile slotting toolholders No. 290330 – 290359.

Application: For checking the spindle orientation using a dial indicator.



Type		2	3	6	10	14	18
29K 29 0397	Alignment aid for machining centres	eShop	eShop	eShop	eShop	eShop	eShop
L_1	mm	50	50	50	60	70	70
L_2	mm	5	6.08	10.08	13.1	18	26
Suitable for:		–	Size 8; 10	Size 14; 17	Size 19	Size 27	Size 38
Profile slotting toolholders No. 290330 – 290334		–	Size 9; 11	Size 17	Size 28	Size 37	Size 45
Profile slotting toolholders No. 290340 – 290344		–	Size 3; 4; 5	Size 6; 8	Size 10; 12	Size 14	Size 18
Groove slotting toolholders No. 290350 – 290359		Size 2	Size 3; 4; 5	Size 6; 8	Size 10; 12	Size 14	Size 18

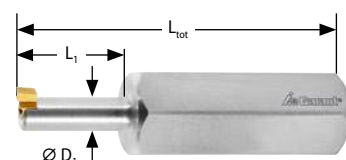
Garant Regrinding toolholder for cutting inserts

Made of aluminium with handy hexagon shank for easy use.

Suitable for: Cutting inserts No. 290336 – 290379.

Application: For safe and easy regrinding of the cutting inserts with an oilstone.

Type	29K 29 0398	L_{tot}	L_1	$\varnothing D_1$	Suitable for:		
	Regrinding toolholder	mm	mm	mm	Cutting insert No. 290360 – 290379	Cutting insert No. 290336	Cutting insert No. 290346
2	eShop	150	50	10	Size 2	–	–
3-5	eShop	150	50	12	Size 3 - 5	Size 8; 10	Size 9; 11
6-8	eShop	150	50	15	Size 6 - 8	Size 14; 17	Size 17
10-12	eShop	150	50	20	Size 10 - 12	Size 19	Size 28
14-16	eShop	150	50	25	Size 14 - 16	Size 27	Size 37
18-25	eShop	150	50	32	Size 18 - 25	Size 38	Size 45



Garant Keyway broaching and profile slotting – technical instructions

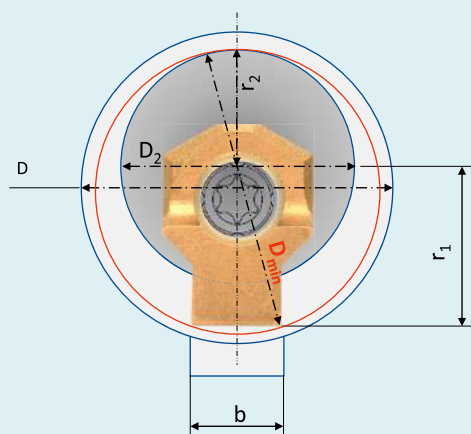


Standard application values:

	Alu plastics	Alu	Alu cast > 10 % Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	INOX < 900 N	INOX > 900 N	Gg(G)	CuZn
	N	N	N	P	P	P	P	P	M	M	K	N
v_f mm/min	8000	8000	8000	10000	8000	6000	6000	6000	5000	5000	5000	7000
a_p mm	0.20	0.20	0.20	0.20	0.11	0.08	0.08	0.08	0.06	0.05	0.13	0.10

Formula for calculating D_{min}

$$D_{min} = \sqrt{r_1^2 + \left(\frac{b}{2}\right)^2} + r_2$$



HSS

duMONT Push broach sets

Set of push broaches **HSS** No. 290405 including the necessary shims No. 290410 and guide bushes No. 290415. Supplied in a high-quality sturdy wooden case for secure and clear storage.

- Note:**
- Fits P9 and H9 available ex stock at a 15 % additional charge.
 - Sets of push broaches for single pass use on request.



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si										INOX	INOX	GG(G)	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N	N				
29 0400	○	●	○	●	●	○								○		●	●	○	●			
Type	2-3			4-8			10-14			16-18			20-25									
29 0400	Push broach set HSS, complete in a wooden case Fit JS9			eShop			eShop			eShop			(eShop)									
Content: 1× each broach 290405	2A; 3A			4B1; 5B1; 6C1; 8C1			10D1; 12D1; 14D1			16E1; 18E1			20F1; 22F1; 25F1									
1× each guide bush No. 290415	Type A: 6; 8; 10			Type B1: 12; 14; 15; 16; Type C1: 18; 19; 20; 22; 24; 25; 26; 28; 30			Type D1: 32; 34; 35; 36; 38; 40; 42; 44; 45; 46; 48; 50			Type E1: 52; 54; 55; 56; 58; 60; 62; 65			Type F1: 70; 75; 80; 85; 90; 95									

duMONT Keyway broaches (push broaches) for one-off and series production

HSS

Application: For production of keyways to DIN 6885.

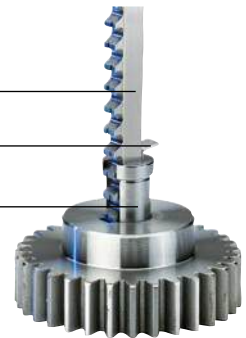
Supplied with: Broaches including the necessary shims.

- Note:**
- Broaches for high tensile materials, increased number of passes or special applications available (on request).
 - After first and second of three passes, back the broach off slightly – the broach will then align itself.
 - Coated broaches and **inch size** broaches available on request.
 - Size 28, 32 and 36 available on request, on short lead times.

Broach

Shim

Guide bush



Suitable for/ v _c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si											INOX	INOX	GG(G)	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N	N					
29 0405 – 0407	○	●	○	●	●	○								○		●	●	○	●				

Type	29J 29 0405	29J 29 0406	29J 29 0407	Broach length	Keyway width	Keyway depth	for bore Ø to DIN 6885	Broaching length in steel	necessary broaching force for St50 and max. broaching length	Back width	Number of passes
	Keyway broach HSS										
	Fit JS9	Fit P9	Fit H9	mm	mm	mm	mm	mm	kg	mm	
2A	eShop	(eShop)	(eShop)	127	2	1	6 – 8	6 – 30	350	3.25	1
3A	eShop	(eShop)	(eShop)	127	3	1.4	8 – 10	6 – 30	300	3.25	2
4B1	eShop	(eShop)	(eShop)	172	4	1.8	11 – 12	8 – 42	550	6.46	2
5B1	eShop	(eShop)	(eShop)	172	5	2.3	12 – 17	8 – 42	850	6.46	2
6C1	eShop	(eShop)	(eShop)	299	6	2.8	18 – 22	10 – 64	1000	9.63	2
8C1	eShop	(eShop)	(eShop)	299	8	3.3	22 – 30	10 – 64	1700	9.63	3
10D1	eShop	(eShop)	(eShop)	353	10	3.3	30 – 38	25 – 150	2950	14.39	3
12D1	eShop	(eShop)	(eShop)	353	12	3.3	38 – 44	25 – 150	3800	14.39	3
14D1	eShop	(eShop)	(eShop)	353	14	3.8	44 – 50	25 – 150	5050	14.39	3
16E1	eShop	(eShop)	(eShop)	394	16	4.3	50 – 58	25 – 150	4300	19.34	4
18E1	eShop	(eShop)	(eShop)	394	18	4.4	58 – 65	25 – 150	4800	19.34	4
20F1	eShop	(eShop)	(eShop)	505	20	4.9	65 – 75	25 – 150	4000	25.72	4
22F1	eShop	(eShop)	(eShop)	505	22	5.4	75 – 85	25 – 150	4300	25.72	5
25F1	eShop	(eShop)	(eShop)	505	25	5.4	85 – 95	25 – 150	8300	25.72	5

Shims for broaches

Type	3A	4B1	5B1	6C1	8C1	10-12D1	14D1	16-18E1	20F1	22-25F1
29 0410	Shim for keyway broach No. 290405 – 407									
	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop

HSS

duMONT Keyway broaches for a single pass

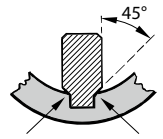
Sizes 4B1 to 8C1 additionally with 45° edge breaker.

This deburrs the sharp edges of the groove.

Application: For efficient cutting of splines to DIN 6885 in a single pass.

Note:

- For size 2A please use part No. 290405 2A.
- Fits P9 and H9 available on request.
- After 1/3 and 2/3 of the pass, back the broach off slightly – the broach will then align itself.



Suitable for/ v _c [m/min]	Alu plastics	Alu cast	Alu cast > 10% Si	< 500 N	< 750 N	< 900 N	< 1100 N	< 1400 N	< 55 HRC	< 60 HRC	< 65 HRC	< 67 HRC	< 70 HRC	INOX < 900 N	INOX > 900 N	GG(G)	CuZn	Graphite GRP CRP					
ISO code	N	N	N	P	P	P	P	P	H	H	H	H	H	M	M	K	N	N					
29.0420	○	●	○	●	●	○								○		●	●	○	●				
Type	29J 29 0420			Broach length			Keyway width			Keyway depth			for bore Ø to DIN 6885			Broaching length in steel			necessary broaching force for St50 and max. broach- ing length			Back width	
	Keyway broach HSS			mm			mm			mm			mm			mm			kg			mm	
	Fit JS9																						
3A	eShop			197			3			1.4			8 – 10			6 – 25			400			3.25	
4B1	eShop			273			4			1.8			11 – 12			8 – 40			450			6.46	
5B1	eShop			273			5			2.3			12 – 17			8 – 40			600			6.46	
6C1	eShop			432			6			2.8			17 – 22			8 – 50			700			9.63	
8C1	eShop			470			8			3.3			22 – 30			8 – 50			1100			9.63	

Guide bushes for keyway broaches

Size 6A–22C1 – With collar.

Size 24C1–90F1 – Without collar.

Application: Push broaches with identification mark A and guide bushes with identification mark A can be used together.

The same applies to the other markings. So that the broach can run through to its full height and can drop back again freely, the guide bush must be inserted into the press bedplate at the same time as the workpiece is threaded through.

Note:

Further sizes available on request.

Bush Ø	29J 29 0415	Slot width	Length	Bush Ø	29J 29 0415	Slot width	Length
	Guide bush				Guide bush		
mm	for bore H7	mm	mm	mm	for bore H7	mm	mm
6A	eShop	3.25	32	28C1	eShop	9.63	64
8A	eShop	3.25	32	30C1	eShop	9.63	64
9A	eShop	3.25	32	32D1	eShop	14.39	100
10A	eShop	3.25	32	35D1	eShop	14.39	100
11B1	eShop	6.46	43	36D1	eShop	14.39	100
12B1	eShop	6.46	43	38D1	eShop	14.39	100
13B1	eShop	6.46	43	40D1	eShop	14.39	100
14B1	eShop	6.46	43	45D1	eShop	14.39	125
15B1	eShop	6.46	43	50D1	eShop	14.39	125
16B1	eShop	6.46	43	55E1	eShop	19.34	150
17B1	eShop	6.46	43	60E1	eShop	19.34	150
18C1	eShop	9.63	64	65E1	eShop	19.34	150
19C1	eShop	9.63	64	70F1	eShop	25.72	150
20C1	eShop	9.63	64	75F1	eShop	25.72	150
22C1	eShop	9.63	64	80F1	eShop	25.72	150
24C1	eShop	9.63	64	90F1	eShop	25.72	150
25C1	eShop	9.63	64				



29 0415

Guide bushes with collar
from 6 – 22 mm Ø.

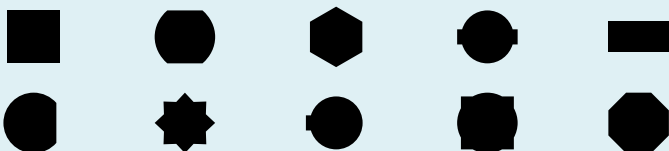


29 0415

Guide bushes
from 24 – 90 mm Ø.

Special broaches – ask for our questionnaire!

Examples of profiles for special push broaches:

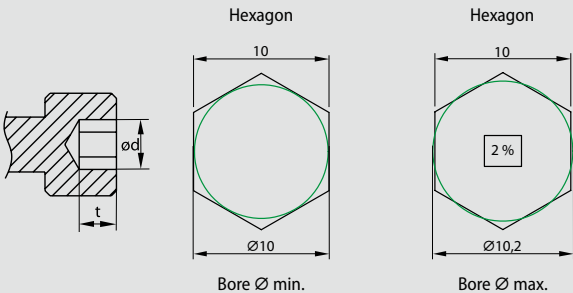
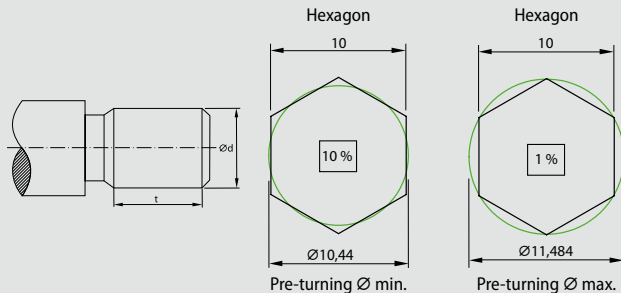


Square (No. 29 0426) and hexagon (No. 29 0431) push broaches are available from supplier's stock. Further sizes are available at short notice from manufacturer's stock.

We will be happy to prepare a quotation for you.

Garant Profile broaching (tumbling)

Hexagon, square, Torx® and Torx Plus® profiles – created in seconds:

Internal profile			External profiles		
Preparation (bore) To protect the cutting edge and reduce the machining time, pre-drill the workpiece with the largest possible bore diameter.			Preparation (workpiece) To protect the cutting edge and reduce the machining time, pre-turn the workpiece to the smallest possible diameter. It is essential that the workpiece diameter is less than the radius diameter of the hexagonal profile.		
Guide values bore $\varnothing d$ (AF plus oversize):			Guide values for workpiece $\varnothing D$ (circle $\varnothing$ less oversize):		
Width across flats AF	Positive oversize		Width across flats AF	Material	Negative oversize Hexagon
mm	Hexagon %	Square %	mm	N	%
2 to 25	+ 0 to + 2	+5	3 to 14	< 750	- 1 to - 7
			3 to 14	< 900	- 3 to - 10
Guide values for bore $\varnothing d$ (Torx® / Torx Plus®):			For hexagonal profiles a guide value for the diameter of the circumscribed circle is: $\varnothing D = \text{Width across flats} \times \text{factor } 1.16$. Example calculation of radius diameter calculation (see diagram below): Pre-turning $\varnothing D_{\min} = 10 \text{ mm} \times 1.16 - 10\% = 10.44 \text{ mm}$ Pre-turning $\varnothing D_{\max} = 10 \text{ mm} \times 1.16 - 1\% = 11.484 \text{ mm}$		
Torx®	Hole $\varnothing$	Bore oversize 0.00 –	Torx®	Hole $\varnothing$	Bore oversize 0.00 –
mm	mm	mm	mm	mm	mm
TX5	1	+0.05	TX27	3.75	+0.1
TX6	1.4	+0.05	TX30	4.2	+0.1
TX7	1.55	+0.07	TX40	5	+0.15
TX8	1.9	+0.1	TX45	5.8	+0.2
TX10	2.2	+0.1	TX50	6.7	+0.2
TX15	2.6	+0.1	TX55	8.2	+0.2
TX20	3	+0.1	TX60	9.9	+0.2
TX25	4	+0.1			
Torx Plus®	Hole $\varnothing$	Bore oversize 0.00 –	Torx Plus®	Hole $\varnothing$	Bore oversize 0.00 –
mm	mm	mm	mm	mm	mm
IP6	1.5	+0.1	IP20	3.2	+0.1
IP8	2	+0.1	IP25	3.6	+0.1
IP10	2.3	+0.1	IP30	4.5	+0.1
IP15	2.7	+0.1	IP40	5.4	+0.15
The guide value of the hole depth t for a blind hole is: $t = \text{desired profile depth} \times \text{factor } 1.5$. A counterbore of the bore facilitates centring of the broach (countersink $\varnothing \triangleq$ the minimum external $\varnothing$ of the profile). At larger bore diameters the bore contour remains slightly visible on the faces. This does not cause any technical or qualitative restriction on the functionality of the profile.			The guide value for the pre-turning length t is: $t = \text{desired profile length} \times \text{factor } 1.2 \text{ to } 1.4$. A rear chamfer or an undercut promotes chip breaking. A chamfer on the workpiece facilitates centring of the cutter insert.		
 Hexagon 10 $\varnothing d$ t Bore $\varnothing$ min. Hexagon 10 2 % $\varnothing 10,2$ Bore $\varnothing$ max.			 Hexagon 10 $\varnothing d$ t Pre-turning $\varnothing$ min. Hexagon 10 1 % $\varnothing 11,484$ Pre-turning $\varnothing$ max.		
Profile broaching process (tumbling) Concentric movement (tumbling) of the cutting edge quickly generates the desired profile in a single pass, with good process reliability. When machining on a CNC lathe, start at a low speed ($n \approx 100 \text{ rpm} - 200 \text{ rpm}$) and high feed rate ($f \approx 0.1 \text{ mm/rev} - 0.3 \text{ mm/rev}$). After a machining depth of approx. 0.5 mm, increase the feed rate and speed as shown in the table on page 922. Retract at a higher feed rate.					
Notes For maximum stability, always select the largest possible toolholder. Cooling lubrication is necessary – because of the small depth of the profile, external cooling is sufficient.					



29

Profile	Size	V _c m/min	Alu plastics	Alu	Alu cast > 10 % Si				INOX	GG(G)	CuZn
			N	N	N	P	P	P	M	K	N
			●	●	○	●	●	●	○	○	●
Hexagon	2 mm – 13 mm	f mm/rev	60	50	40	40	30	25	25	30	40
	14 mm – 25 mm		0.14	0.1	0.1	0.1	0.1	0.08	0.08	0.11	0.12
Square	2 mm – 11 mm		0.1	0.08	0.08	0.08	0.08	0.06	–	0.08	0.09
	12 mm – 20 mm		0.1	0.08	0.08	0.06	0.06	0.05	0.04	0.07	0.1
Torx® / Torx Plus®	TX5 – TX20 IP6 – IP20		0.08	0.06	0.06	0.04	0.04	0.03	–	–	0.08
	TX25 – TX60 IP25 – IP40		0.14	0.1	0.1	0.1	0.1	0.08	0.08	0.11	0.12
			0.1	0.08	0.08	0.08	0.08	0.06	–	0.08	0.1

Garant Profile broaching holder for internal profiles

Optional extras: Positioning aid (No. 293000) and pin wrench (No. 293006).

Note:

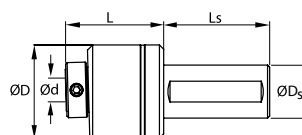
- Caution: Always use appropriate slotting tool Ø.
- Other shank connections on request.

Holder with plain and Morse taper shank

293029/3079 – Suitable for automatic lathes.

Suitable for: CNC and conventional machines.

Optional extras: Drive-out tang for MT shanks can be ordered under No. 293008 in the sizes MT2, MT3 and MT4.



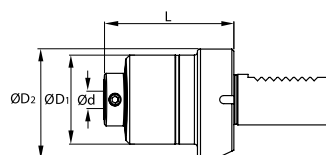
293023

Shank Ø D _s	29K 29 3029	29K 29 3020	29K 29 3023	29K 29 3026	L				L _s				Ø D			
	Toolholder for metric profile broaching tools				29 3029	29 3020	29 3023	29 3026	29 3029	29 3020	29 3023	29 3026	29 3029	29 3020	29 3023	29 3026
mm	Ø d = 5 mm	Ø d = 8 mm	Ø d = 12 mm	Ø d = 16 mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
8	eShop	–	–	–	34	–	–	–	35	–	–	–	22	–	–	–
12	eShop	eShop	–	–	34	38	–	–	35	35	–	–	22	33	–	–
16	eShop	eShop	eShop	–	34	38	46	–	35	35	35	–	22	33	44	–
20	eShop	eShop	eShop	eShop	34	38	46	76	46	50	50	–	22	33	44	58
22	eShop	eShop	eShop	eShop	34	38	46	76	46	50	50	–	22	33	44	58
25	–	eShop	eShop	eShop	–	38	46	76	–	50	50	–	–	33	44	58
32	–	–	eShop	eShop	–	–	46	76	–	–	50	–	–	–	44	58
40	–	–	–	eShop	–	–	–	76	–	–	50	–	–	–	–	58
MK2	–	eShop	eShop	–	–	38	46	–	–	69	69	–	–	33	44	–
MK3	–	–	–	eShop	–	–	–	76	–	–	86	–	–	–	–	58
MK4	–	–	–	eShop	–	–	–	76	–	–	109	–	–	–	–	58

Shank Ø D _s	29K 29 3079	29K 29 3070	29K 29 3073	29K 29 3076	L				L _s				Ø D			
	Toolholder for imperial profile broaching tools				29 3079	29 3070	29 3073	29 3076	29 3079	29 3070	29 3073	29 3076	29 3079	29 3070	29 3073	29 3076
in	Ø d = 5 mm	Ø d = 8 mm	Ø d = 12 mm	Ø d = 16 mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
5/8	eShop	eShop	–	–	34	38	–	–	35	35	–	–	22	33	–	–
3/4	eShop	eShop	eShop	eShop	34	38	46	76	46	50	50	–	22	33	44	58
1	–	eShop	eShop	eShop	–	38	46	76	–	50	–	–	–	33	44	58
1.1/4	–	–	eShop	eShop	–	–	46	76	–	50	–	–	–	–	44	58

Toolholder with VDI arbor

Suitable for: CNC machines.



293030

Shank mounting type	29K 29 3030	29K 29 3033	L		Ø D ₁		Ø D ₂	
	Toolholder for VDI profile broaching tools							
	Ø d = 12 mm	Ø d = 16 mm	mm		mm		mm	
VDI20	eShop	–	57		44		50	
VDI25	eShop	–	64		44		58	
VDI30	eShop	eShop	83		58		68	
VDI40	eShop	eShop	83		58		83	

Garant Cutter inserts for profile broaching holder

Application: For generation of profiles in a **single pass**.

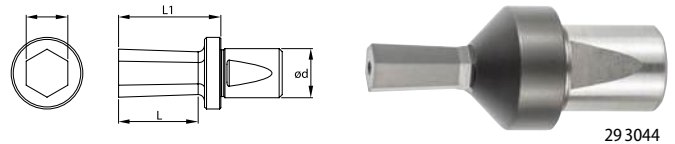
Note:

- Special sizes and special profiles available on request.
- Detailed application values can be found in our application ToolScout.

Hex socket metric (stainless steels)

With high-performance coating (tungsten carbide/carbon). Optimised geometry of the cutting edge (hollows) for profile broaching in stainless steels.

Suitable for: Toolholder for profile broaching tools No. 293020 – 293026; 293070 – 293076; 293030; 293033.



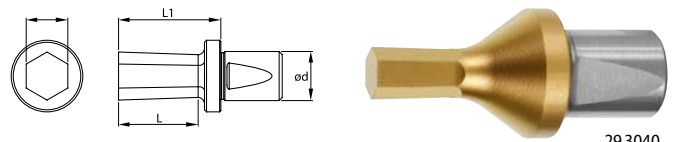
29 3044

Hexagon	29L	29 3041	29L	29 3044	29L	29 3047	L		Tolerance
Profile broaching insert, hex socket metric									
		Ø d = 8 mm		Ø d = 12 mm		Ø d = 16 mm	29 3041	29 3044 29 3047	
mm		WC/C		WC/C		WC/C	mm	mm	mm
3		eShop		eShop		—	7	7	+0.06 to +0.08
4		eShop		eShop		eShop	9	9	+0.07 to +0.09
5		eShop		eShop		eShop	11	11	+0.08 to +0.1
6		eShop		eShop		eShop	13	13	+0.08 to +0.1
8		eShop		eShop		eShop	13	17	+0.08 to +0.1
10		—		eShop		eShop	—	21	+0.1 to +0.12
12		—		—		eShop	—	21	+0.11 to +0.13
14		—		—		eShop	—	21	+0.12 to +0.14
L ₁	mm	18		25		40			

Hex socket metric

With TiN coating.

Suitable for: Profile broaching holder No. 293020 – 293079.



29 3040

Hexagon	29L	29 3049	29L	29 3040	29L	29 3043	29L	29 3046	L				Tolerance
	Profile broaching insert, hex socket metric												
	Ø d = 5 mm	Ø d = 8 mm	Ø d = 12 mm	Ø d = 16 mm	29 3049	29 3040	29 3043	29 3046					
mm	TiN	TiN	TiN	TiN	mm	mm	mm	mm	mm	mm	mm	mm	mm
1,5	eShop	eShop	eShop	—	3	3	3	—					+ 0.04 to + 0.06
2	eShop	eShop	eShop	—	3.5	3.5	3.5	—					+ 0.05 to + 0.07
2,5	eShop	eShop	eShop	—	4	4	4	—					+ 0.06 to + 0.09
3	eShop	eShop	eShop	eShop	5	5	5	5					+ 0.07 to + 0.1
3,5	eShop	eShop	eShop	eShop	6	6	6	6					+ 0.08 to + 0.11
4	eShop	eShop	eShop	eShop	6	6.5	6.5	6.5					+ 0.09 to + 0.12
4,5	eShop	eShop	eShop	eShop	7	7.5	7.5	7.5					+ 0.09 to + 0.12
5	eShop	eShop	eShop	eShop	7	8.5	8.5	8.5					+ 0.12 to + 0.15
6	eShop	eShop	eShop	eShop	7	10.5	10.5	10.5					+ 0.13 to + 0.16
7	—	eShop	eShop	eShop	—	12	13	13					+ 0.13 to + 0.16
8	—	eShop	eShop	eShop	—	12.5	15.5	15.5					+ 0.14 to + 0.17
9	—	eShop	eShop	eShop	—	12.5	20	20					+ 0.14 to + 0.17
10	—	eShop	eShop	eShop	—	12.5	20	20					+ 0.15 to + 0.18
11	—	—	eShop	eShop	—	—	20	20					+ 0.15 to + 0.18
12	—	—	eShop	eShop	—	—	20	20					+ 0.16 to + 0.19
13	—	—	eShop	eShop	—	—	20	28					+ 0.16 to + 0.19
14	—	—	eShop	eShop	—	—	20	32					+ 0.16 to + 0.19
15	—	—	—	eShop	—	—	—	32					+ 0.17 to + 0.2
16	—	—	—	eShop	—	—	—	32					+ 0.17 to + 0.2
17	—	—	—	eShop	—	—	—	32					+ 0.17 to + 0.2
18	—	—	—	eShop	—	—	—	32					+ 0.18 to + 0.21
19	—	—	—	eShop	—	—	—	32					+ 0.18 to + 0.21
20	—	—	—	eShop	—	—	—	32					+ 0.18 to + 0.21
21	—	—	—	eShop	—	—	—	32					+ 0.22 to + 0.26
22	—	—	—	eShop	—	—	—	32					+ 0.22 to + 0.26
23	—	—	—	eShop	—	—	—	32					+ 0.22 to + 0.26
24	—	—	—	eShop	—	—	—	32					+ 0.24 to + 0.28
25	—	—	—	eShop	—	—	—	32					+ 0.24 to + 0.28
L	mm	10	18	25	40								



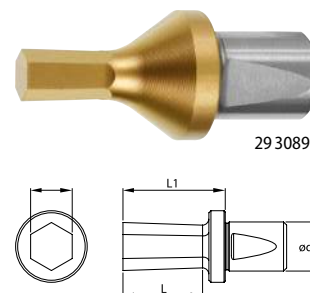
29

Hex socket imperial

With TiN coating.

Suitable for: Profile broaching holder No. 293020 – 293079.

Hexagon	29L 29 3089	29L 29 3080	29L 29 3083	29L 29 3086	L				Tolerance
Profile broaching insert, hex socket imperial									
	Ø d = 5 mm	Ø d = 8 mm	Ø d = 12 mm	Ø d = 16 mm	29 3089	29 3080	29 3083	29 3086	
in	TiN	TiN	TiN	TiN	mm	mm	mm	mm	mm
7/64	eShop	eShop	eShop	eShop	4	4	4	4	+ 0.06 to + 0.09
1/8	eShop	eShop	eShop	eShop	5	5	5	5	+ 0.07 to + 0.1
3/16	eShop	eShop	eShop	eShop	7	8	8	8	+ 0.1 to + 0.13
7/32	eShop	eShop	eShop	eShop	7	9.5	9.5	9.5	+ 0.13 to + 0.16
1/4	—	eShop	eShop	eShop	—	11	11	11	+ 0.13 to + 0.16
5/16	—	eShop	eShop	eShop	—	12.5	15.5	15.5	+ 0.13 to + 0.16
3/8	—	eShop	eShop	eShop	—	18	21	20	+ 0.14 to + 0.17
1/2	—	—	eShop	eShop	—	—	21	27	+ 0.16 to + 0.19
L ₁ mm	10	18	25	40					



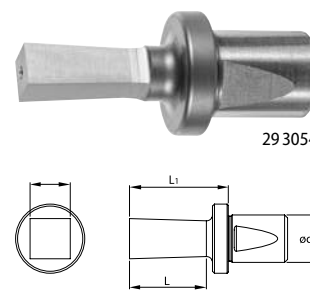
29 3089

Square socket metric (stainless steels)

With high-performance coating (tungsten carbide/carbon). Optimised geometry of the cutting edge (hollows) for profile broaching in stainless steels.

Suitable for: Toolholder for profile broaching tools No. 293020 – 293026; 293070 – 293076; 293030; 293033.

Square	29L 29 3051	29L 29 3054	29L 29 3057	L		Tolerance
Profile broaching insert, square socket metric						
	Ø d = 8 mm	Ø d = 12 mm	Ø d = 16 mm			
mm	WC/C	WC/C	WC/C	mm	mm	mm
4	eShop	eShop	—	9		+ 0.07 to + 0.09
5	eShop	eShop	—	11		+ 0.08 to + 0.1
6	—	eShop	eShop	13		+ 0.08 to + 0.1
7	—	eShop	eShop	15		+ 0.08 to + 0.1
8	—	eShop	eShop	17		+ 0.08 to + 0.1
10	—	eShop	eShop	21		+ 0.1 to + 0.12
L ₁ mm	18	25	40			



29 3054

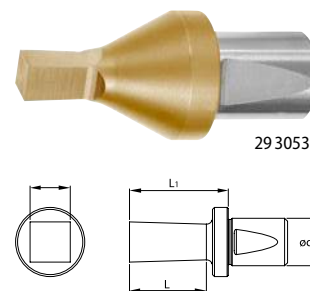
Square socket metric

With TiN coating.

Suitable for: Profile broaching holder No. 293020 – 293079.

Note: The manufacture of square profiles > 9 mm is recommended only in easily machined materials (higher rate of material removal).

Square	29L 29 3059	29L 29 3050	29L 29 3053	29L 29 3056	L			Tolerance
Profile broaching insert, square socket metric								
	Ø d = 5 mm	Ø d = 8 mm	Ø d = 12 mm	Ø d = 16 mm	29 3059	29 3050	29 3053 29 3056	
mm	TiN	TiN	TiN	TiN	mm	mm	mm	mm
1,5	eShop	eShop	eShop	—	3	3	3	+ 0.04 to + 0.06
2	eShop	eShop	eShop	—	3.5	3.5	3.5	+ 0.05 to + 0.07
2,5	eShop	eShop	eShop	—	4	4	4	+ 0.06 to + 0.09
3	eShop	eShop	eShop	eShop	5	5	5	+ 0.07 to + 0.1
3,5	eShop	eShop	eShop	eShop	6	6	6	+ 0.08 to + 0.11
4	eShop	eShop	eShop	eShop	6.5	6.5	6.5	+ 0.09 to + 0.12
4,5	eShop	eShop	eShop	eShop	7.5	7.5	7.5	+ 0.09 to + 0.12
5	eShop	eShop	eShop	eShop	6	8.5	8.5	+ 0.12 to + 0.15
6	eShop	eShop	eShop	eShop	6	10.5	10.5	+ 0.13 to + 0.16
7	—	eShop	eShop	eShop	—	12	13	+ 0.13 to + 0.16
8	—	—	eShop	eShop	—	—	15.5	+ 0.14 to + 0.17
9	—	—	eShop	eShop	—	—	20	+ 0.14 to + 0.17
10	—	—	eShop	eShop	—	—	20	+ 0.15 to + 0.18
11	—	—	—	eShop	—	—	20	+ 0.15 to + 0.18
12	—	—	—	eShop	—	—	20	+ 0.16 to + 0.19
13	—	—	—	eShop	—	—	28	+ 0.16 to + 0.19
14	—	—	—	eShop	—	—	32	+ 0.16 to + 0.19
15	—	—	—	eShop	—	—	32	+ 0.17 to + 0.2
16	—	—	—	eShop	—	—	32	+ 0.17 to + 0.2
17	—	—	—	eShop	—	—	32	+ 0.17 to + 0.2
18	—	—	—	eShop	—	—	32	+ 0.18 to + 0.21
19	—	—	—	eShop	—	—	32	+ 0.18 to + 0.21
20	—	—	—	eShop	—	—	32	+ 0.18 to + 0.21
L ₁ mm	10	18	25	40				

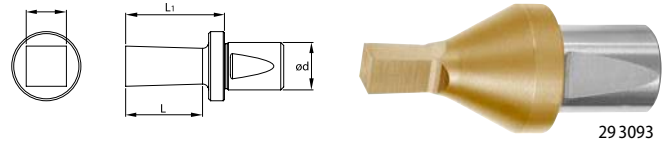


29 3053

Square socket imperial

With TiN coating.

Suitable for: Profile broaching holder No. 293020 – 293079.

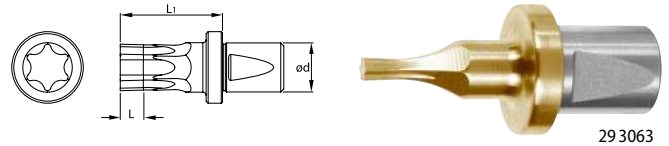


Square	29L 29 3099	29L 29 3090	29L 29 3093	29L 29 3096	L			Tolerance
	Profile broaching insert, square socket imperial							
	Ø d = 5 mm	Ø d = 8 mm	Ø d = 12 mm	Ø d = 16 mm	29 3099	29 3090 29 3093	29 3096	
in	TiN	TiN	TiN	TiN	mm	mm	mm	mm
3/16	eShop	—	—	—	7	—	—	+ 0.1 to + 0.13
7/32	eShop	eShop	eShop	eShop	7	10.5	10.5	+ 0.13 to + 0.16
1/4	—	eShop	eShop	eShop	—	12	12	+ 0.13 to + 0.16
3/8	—	—	eShop	eShop	—	21	20	+ 0.14 to + 0.17
1/2	—	—	eShop	eShop	—	21	27	+ 0.16 to + 0.19
L ₁ mm	10	18	25	40				

Torx® internal profile

With TiN coating.

Suitable for: Profile broaching holder No. 293020 – 293079.

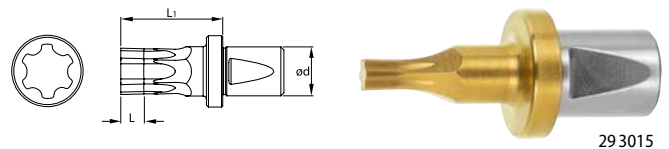


Torx® profile	29L 29 3069	29L 29 3060	29L 29 3063	29L 29 3066	L		Tolerance
	Profile broaching insert internal Torx®						
	Ø d = 5 mm	Ø d = 8 mm	Ø d = 12 mm	Ø d = 16 mm			
mm	TiN	TiN	TiN	TiN	mm		mm
TX5	eShop	eShop	eShop	—	1.5		0.0 to +0.01
TX6	eShop	eShop	eShop	—	1.7		0.0 to +0.01
TX7	eShop	eShop	eShop	—	1.7		0.0 to +0.01
TX8	eShop	eShop	eShop	—	2		- 0.005 to + 0.01
TX10	eShop	eShop	eShop	eShop	2		- 0.005 to + 0.01
TX15	eShop	eShop	eShop	eShop	3		- 0.005 to + 0.01
TX20	eShop	eShop	eShop	eShop	3.5		- 0.005 to + 0.01
TX25	—	eShop	eShop	eShop	4		- 0.005 to + 0.01
TX27	—	eShop	eShop	eShop	4		- 0.005 to + 0.01
TX30	—	eShop	eShop	eShop	4.5		- 0.005 to + 0.01
TX40	—	—	eShop	eShop	5		- 0.01 to + 0.01
TX45	—	—	eShop	eShop	5.5		- 0.01 to + 0.01
TX50	—	—	eShop	eShop	6		- 0.01 to + 0.01
TX55	—	—	eShop	eShop	7		- 0.015 to + 0.015
TX60	—	—	—	eShop	7.5		- 0.015 to + 0.015
L ₁ mm	10	18	25	40			

Torx Plus® internal profile

With TiN coating.

Suitable for: Profile broaching holder No. 293020 – 293079.



Torx Plus® profile	29L 29 3015	29L 29 3017	L		Tolerance
	Profile broaching insert, internal Torx Plus®				
	Ø d = 8 mm	Ø d = 12 mm			
mm	TiN	TiN	mm		mm
IP6	eShop	eShop	1.7		0.01 to +0.02
IP8	eShop	eShop	2		+0.005 to +0.02
IP10	eShop	eShop	2		+0.005 to +0.02
IP15	eShop	eShop	3		+0.005 to +0.02
IP20	eShop	eShop	3.5		+0.005 to +0.02
IP25	eShop	eShop	4		+0.005 to +0.02
IP30	eShop	eShop	4.5		+0.005 to +0.02
IP40	—	eShop	5		0.0 to +0.02
L ₁ mm	18	25			



29

Garant Profile broaching holder for external profiles

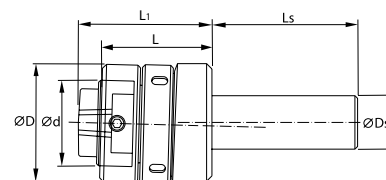
Holder

Suitable for: CNC and conventional machines.



29 3102

Shank $\varnothing D_s$	mm	16	20	25	32
29 3102	Profile broaching holder $\varnothing d = 32 \text{ mm}$	eShop	eShop	eShop	eShop
L	mm	41.5			
L ₁	mm	50			
L ₂	mm	50			
$\varnothing D$	mm	44			



Adapter

Suitable for:

Size 16 – Profile broaching holder for internal profiles No. 293026, 293033, 293076.

Size 12 – Profile broaching holder for internal profiles No. 293023, 293030, 293073.

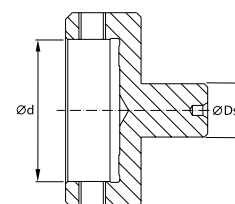
Application: With this adapter, cutter inserts for outer profiles can also be used in conjunction with a profile broaching holder for inner profiles.

Note: For reasons of stability, use the profile broaching holder No. 293102 on higher batch sizes or materials that are difficult to machine.



29 3105

Shank $\varnothing D_s$	mm	12	16
29 3105	Adapter $\varnothing d = 32 \text{ mm}$	eShop	eShop
Profile length t _{max}	mm	20	31 (up to 8 AF); 20 (from 10 AF)
L	mm	17	32
L ₁	mm	25.5	40.5
L ₂	mm	15	19



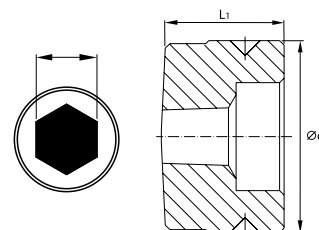
Garant Cutter inserts for profile broaching holder

With TiN coating.

Note: Special geometries on request.
Detailed application values can be found in our application ToolScout.



29 3110



External hexagon

Hexagon	mm	3	4	5	6	8	10	12	14
29 3110	Profile broaching insert for external hexagon $\varnothing d = 32 \text{ mm}$	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop
L ₁	mm	20.5							
Profile length t _{max}	mm	40	40	40	40	30	30	30	30
Tolerance	mm	-0.05 to -0.09	-0.06 to -0.1	-0.07 to -0.11	-0.08 to -0.12	-0.09 to -0.14	-0.09 to -0.14	-0.1 to -0.15	-0.11 to -0.16



Garant Radius turning tool

Application: For turning convex radii on external or internal diameters.

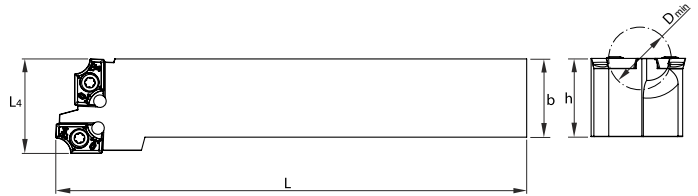
Holder

Suitable for: Radius indexable inserts No. 294510 and 216841.

Note: $D_{\min}$ corresponds to the smallest possible internal diameter of the component to avoid collisions.



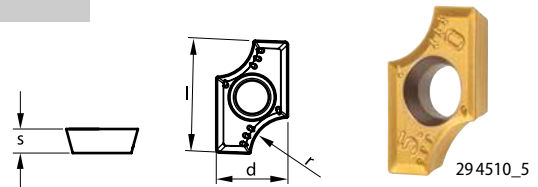
294500



Shank height h	mm	16	20	25
21T 29 4500 Toolholder for radius indexable inserts		eShop	eShop	eShop
suitable indexable insert		294510		
b	mm	16	20	25
$D_{\min}$	mm		20	
L_4	mm		30	
L	mm	100	125	150
Insert screw		269021 2 (TX15; 3 Nm)		

Radius indexable inserts

Suitable for: Toolholder No. 294500 and radius cutter No. 216825.



294510_5

Radius r	mm	1	1,5	2	2,5	3	3,5	4	4,5	5	
21A 29 4510 Radius indexable insert HB7525		eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	10
●		UNI	UNI	UNI	UNI	UNI	UNI	UNI	UNI	UNI	
⚙											
s	mm						3.18				
l	mm						15				
d	mm						9.52				
f	mm/rev.						0.1 – 0.4				
v_c main application	m/min						110 – 390				

Radius turning tool

Application: For turning convex radii on external or internal diameters.

Holder

With ground contact face and location pins for mounting radius indexable inserts.



24 0026

Shank height h	mm	10	12	16	20	25
29W 24 0026 Toolholder for radius indexable inserts		eShop	eShop	eShop	eShop	eShop
for radius indexable inserts		R1 – R6	R1 – R6	R1 – R6	R1 – R6	R 8 – 12
Shank width	mm	10	12	16	20	25
L	mm	103	103	103	117	125

Radius indexable inserts

HSS
Co5

Ground all round and each with four radii of the same size. The cutting edges are relief ground and have chip breakers for best cutting conditions over the entire radius sector. The **rake angle** of 12° is suitable for general purpose use.



240030_R5

Radius	mm	R1	R1,5	R2	R2,5	R3	R4	R5	R6	R8	R10	R12
29W 24 0030 Radius indexable insert 12° HSS-Co5, H7		eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop	eShop



29



Tool bits

Tool bits with straight-cut square ends.

29 5000 – **Square tool bits to DIN 4964 form B. Width: Tolerance h12.** Ends chamfered.

29 5020 – **Tool bits to DIN 4964 form A.** Precision ground within tolerance h14.

29 5030 – **Solid carbide.** Precision round tool bits. Ground within tolerance h6.

29 5060 – **Rectangular tool bits to DIN 4964 form D.**

29 5080 – **Trapezoidal tool bits to DIN 4964 form E.**

29 5000/5020 – **HSS Co 10** (10 % cobalt, 67 HRC).

29 5060/5080 – Height and width: Tolerance h14. **HSS Co 10** (10 % cobalt).

Application: For turning, boring out, grooving etc.; particularly for production of blanks for profile cutters.



D×Length	29 5000	29 5020	29 5030
	Square tool bit	Round tool bit	
mm	HSS Co 10	HSS Co 10	Solid carbide
2×40	—	eShop	—
3×63	—	eShop	—
3×100	—	—	eShop
4×63	—	eShop	—
4×80	eShop	eShop	—
4×100	—	—	eShop
5×63	—	eShop	—
5×80	eShop	eShop	—
5×100	—	—	eShop
6×63	—	eShop	—
6×80	eShop	eShop	—
6×100	eShop	eShop	eShop
8×63	eShop	eShop	—
8×80	—	eShop	—
8×100	eShop	eShop	eShop
8×125	eShop	eShop	—
8×160	eShop	—	—
10×63	eShop	eShop	—
10×80	eShop	eShop	—
10×100	eShop	eShop	eShop
10×125	eShop	—	—
10×160	eShop	eShop	—
10×200	eShop	—	—
12×63	eShop	—	—
12×80	eShop	eShop	—
12×100	eShop	eShop	eShop
12×125	eShop	eShop	—
12×160	eShop	eShop	—
12×200	eShop	—	—
14×100	eShop	—	eShop
14×125	eShop	—	—
14×160	eShop	eShop	—
14×200	eShop	—	—
16×100	eShop	—	eShop
16×125	eShop	eShop	—
16×160	eShop	eShop	—
16×200	eShop	—	—
20×100	—	—	eShop
20×160	eShop	eShop	—
20×200	eShop	eShop	—
25×160	eShop	—	—
25×200	eShop	—	—

Height×width	29 5060	29 5080	Length	
	Square tool bit	Trapezoidal tool bit	29 5060	29 5080
mm	HSS Co 10	HSS Co 10	mm	mm
8×4	eShop	—	100	—
10×2,5	—	eShop	—	80
10×2,5L	—	eShop	—	125
10×5	eShop	—	160	—
10×6	eShop	—	160	—
12×3	—	eShop	—	160
12×6	eShop	—	160	—
12×8	eShop	—	160	—
16×4	eShop	eShop	80	100
16×4L	eShop	eShop	100	160
16×4XL	eShop	—	160	—
16×10	eShop	—	100	—
16×10L	eShop	—	160	—
16×10XL	eShop	—	200	—
20×5	—	eShop	—	160
20×5L	—	eShop	—	200
20×12	eShop	—	160	—
25×6	eShop	eShop	200	160
25×12	eShop	—	200	—

HOLEX D-bit

- 29 5040 – **HSS Co 10** (10 % cobalt). **D-bits with straight cutting edge**, precision ground within tolerance h8. Half section pre-ground, 0.2 mm grinding allowance.
- 29 5050 – **Solid carbide**. **D-bits with straight cutting edge**. Precision ground with maximum run-out error 0.005 mm. Half section pre-ground. **Shank tolerance up to diameter 8 mm = h7.**

Application: For engraving and copying in tool, mould, and die making.

D×Length	22E 29 5040	22E 29 5050	Cutter length	
	D-bits		29 5040	29 5050
mm	HSS Co 10	Solid carbide	mm	mm
2×40	eShop	eShop	3.5	3
2,5×40	—	eShop	—	3
3×50	—	eShop	—	3
3×63	eShop	—	4.5	—
4×63	eShop	eShop	6	4
4×80	eShop	—	6	—
5×63	—	eShop	—	5
5×80	eShop	—	7.5	—
6×80	eShop	eShop	9	6
6×100	eShop	—	9	—
8×90	eShop	eShop	12	8
10×125	eShop	—	15	—
12×140	eShop	—	18	—



HSS Co 10
29 5040



Solid carbide
29 5050

HOLEX HSS/E turning tool

All dimensions **welded**.

Application: Universally applicable, medium cutting speeds.

Shank square		mm	12		16		20	
22E 29 6100	Turning tool right-hand similar to DIN 4952	HSS E	eShop		eShop		eShop	
Overall length		mm	110		140		160	
Shank Ø		mm	8		10		12	
22E 29 6300	Internal turning tool right-hand similar to DIN 4953	HSS E	eShop		eShop		eShop	
Overall length		mm	140		160		180	
for bores from Ø		mm	18		20		22	
Shank Ø		mm	6		8		10	
22E 29 6400	Internal corner turning tool right-hand similar to DIN 4954	HSS E	eShop		eShop		eShop	
Overall length		mm	125		140		160	
for bores from Ø		mm	16		18		20	
Shank square		mm	12		16		20	
22E 29 6500	Pointed turning tool, straight neutral similar to DIN 4955	HSS E	eShop		eShop		eShop	
22E 29 6750	Corner turning tool cranked right-hand similar to DIN 4965	HSS E	eShop		eShop		eShop	
Overall length		mm	110		140		160	
Shank square		mm	12		16		20	
22E 29 6800	Side turning tool right-hand similar to DIN 4960	HSS E	eShop		eShop		eShop	
Overall length		mm	110		140		160	
Shank height		mm	12		16		20	
22E 29 7000	Parting off tool right-hand similar to DIN 4961	HSS E	eShop		eShop		eShop	
Overall length		mm	110		125		140	
Shank width b		mm	8		10		12	
Blade width		mm	3		3		4	
Shank Ø		mm	6		8		10	
22E 29 7120	Hook turning tool right-hand similar to DIN 4963	HSS E	eShop		eShop		eShop	
Overall length		mm	125		140		160	
Blade width		mm	2		3		4	
for bores from Ø		mm	13		16		20	
maximum grooving depth t _{max}		mm	3		4		6	

29 6100

29 6300

29 6400

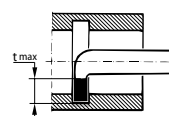
29 6500

29 6750

29 6800

29 7000

29 7120



29

HOLEX Carbide turning tool

Turning tool

Fitted with diamond ground carbide inserts.

Application: P20/K25 for machining steel and cast iron.
M20 for machining stainless steels.

Attention: For rough and interrupted machining the cutting edges should be sharpened with a boron carbide hand lapper (No. 558812).

Shank square	mm	10	12	16	20	25
22E 29 6025	Turning tool right-hand, similar to DIN 4971 (ISO 1)	P20/K25	eShop	eShop	eShop	eShop
22E 29 6030		M20	eShop	eShop	eShop	eShop
Overall length	mm	90	100	110	125	140



29 6025



29 6030

Shank square	mm	10	12	16	20	25
22E 29 6125	Turning tool right-hand, similar to DIN 4972 (ISO 2)	P20/K25	eShop	eShop	eShop	eShop
22E 29 6130		M20	eShop	eShop	eShop	eShop
22E 29 6225	Turning tool left-hand, similar to DIN 4972 (ISO 2)	P20/K25	eShop	eShop	eShop	eShop
Overall length	mm	100	100	110	125	140



29 6125



29 6130

Shank square	mm	10	12	16	20	25
22E 29 6325	Internal turning tool right-hand, similar to DIN 4973 (ISO 8)	P20/K25	eShop	eShop	eShop	eShop
22E 29 6330		M20	eShop	eShop	eShop	eShop
Overall length	mm	150	180	210	250	300
for bores from Ø	mm	18	21	27	34	43



29 6325



29 6330

Shank square	mm	10	12	16	20	25
22E 29 6425	Internal corner turning tool right-hand, similar to DIN 4974 (ISO 9)	P20/K25	eShop	eShop	eShop	eShop
22E 29 6430		M20	eShop	eShop	eShop	eShop
22E 29 6455	Internal corner turning tool left-hand, similar to DIN 4974 (ISO 9)	P20/K25	eShop	eShop	eShop	eShop
Overall length	mm	150	180	210	250	300
for bores from Ø	mm	18	21	27	34	43



29 6425



29 6430

Shank height	mm	16	20	25
22E 29 6525	Turning tool neutral, similar to DIN 4975 (ISO 10)	P20/K25	eShop	eShop
Overall length	mm	110	125	140
Shank width b	mm	10	12	16



29 6525

Shank height	mm	10	12	16	20	25
22E 29 6605	Turning tool, wide neutral, similar to DIN 4976 (ISO 4)	P20/K25	eShop	eShop	eShop	eShop
Overall length	mm	90	100	110	125	140
Shank width b	mm	10	12	16	12	16
Blade width	mm	10	12	16	12	16



29 6605



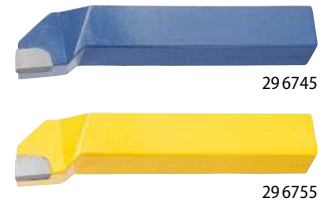
29 6705



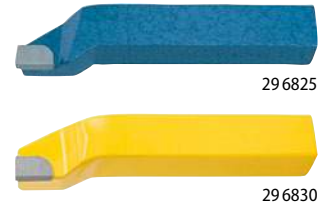
29 6715

Shank square	mm	10	12	16	20	25
22E 29 6705	Face turning tool right-hand, similar to DIN 4977 (ISO 5)	P20/K25	eShop	eShop	eShop	eShop
22E 29 6715		M20	eShop	eShop	eShop	eShop
Overall length	mm	90	100	110	125	140

Shank square	mm	10	12	16	20	25
22E 29 6745	Corner turning tool right-hand, similar to DIN 4978 (ISO 3)	P20/K25	eShop	eShop	eShop	eShop
22E 29 6755		M20	eShop	eShop	eShop	eShop
Overall length	mm	90	100	110	125	150



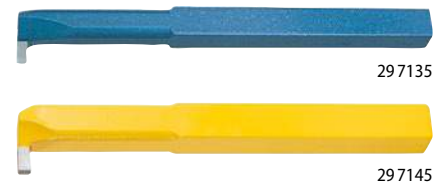
Shank square	mm	10	12	16	20	25
22E 29 6825	Turning tool right-hand, similar to DIN 4980 (ISO 6)	P20/K25	eShop	eShop	eShop	eShop
22E 29 6830		M20	eShop	eShop	eShop	eShop
22E 29 6925	Turning tool left-hand, similar to DIN 4980 (ISO 6)	P20/K25	eShop	eShop	eShop	eShop
Overall length	mm	90	100	110	125	140



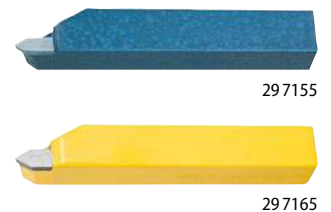
Shank height	mm	12	16	20	25
22E 29 7025	Grooving tool right-hand, similar to DIN 4981 (ISO 7)	P20/K25	eShop	eShop	eShop
22E 29 7030		M20	eShop	eShop	eShop
22E 29 7105	Grooving tool left-hand, similar to DIN 4981 (ISO 7)	P20/K25	eShop	eShop	eShop
Overall length	mm	100	110	125	140
Shank width b	mm	8	10	12	16
Blade width	mm	3	4	5	6



Shank square	mm	10	12	16	20	25
22E 29 7135	Hook turning tool right-hand, similar to DIN 263 (ISO 11)	P20/K25	eShop	eShop	eShop	eShop
22E 29 7145		M20	eShop	eShop	eShop	eShop
Overall length	mm	150	160	180	210	250
Blade width	mm	3	4	5	6	8
for bores from Ø	mm	25	30	40	50	60
maximum grooving depth t _{max}	mm	6	10	12	16	20



Shank square	mm	10	12	16	20	25
22E 29 7155	Thread turning tool right-hand, similar to DIN 282 (ISO 12)	P20/K25	eShop	eShop	eShop	eShop
22E 29 7165		M20	eShop	eShop	eShop	eShop
Overall length	mm	90	110	125	140	140



Shank square	mm	10	12	16	20	25
22E 29 7175	Internal thread turning tool right-hand, similar to DIN 283 (ISO 13)	P20/K25	eShop	eShop	eShop	eShop
22E 29 7185		M20	eShop	eShop	eShop	eShop
Overall length	mm	150	160	180	210	250
for bores from Ø	mm	20	30	36	45	55



Turning toolholder with bore

Slotted in opposite direction; the round boring bar shank is clamped firmly and securely with only little pressure. All external surfaces are machined square.

Application: For holding turning tools with a round shank No. 296300, 296400, 297120 and for round tool bits No. 295020.



Bore Ø	mm	6	8	10	12	16	20
22E 29 7200	Turning toolholder with bore	eShop	eShop	eShop	eShop	eShop	eShop
Height	mm	10	12	14	16	20	25
Overall length	mm	70	80	85	90	100	110



29