Member IMC Group

Ingersoll Cutting Tools

RAPIDTHREADTAPS

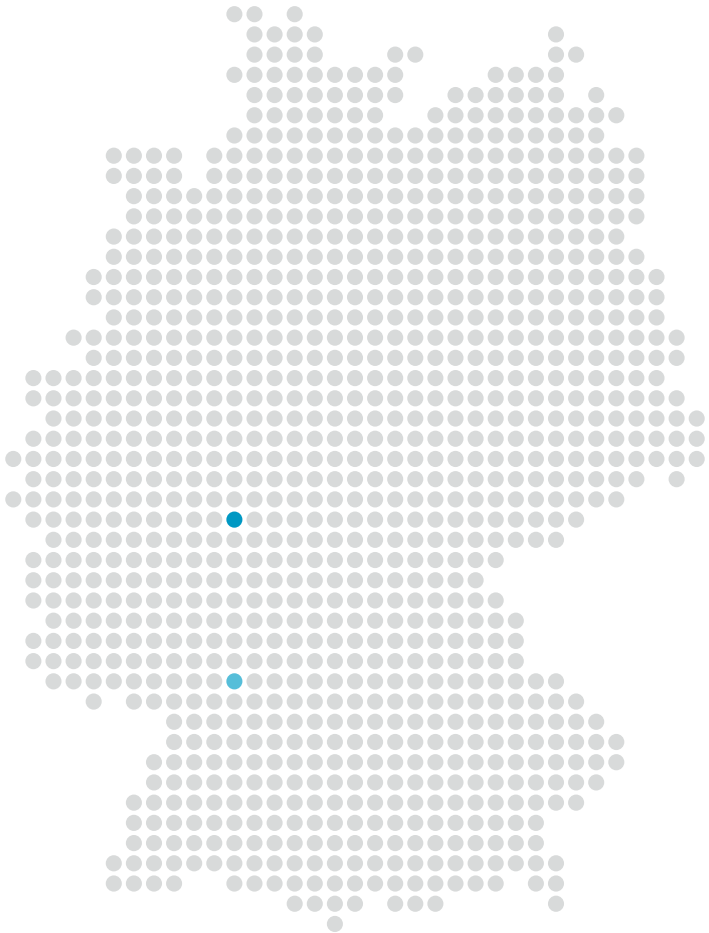
TAPPING TOOLS

INGERSOLL WERKZEUGE GMBH

Ingersoll Werkzeuge GmbH is specialized in the production of cutting tools with an excellent vibration-free performance in both standard and special-purpose design.

In addition to very successful solutions for heavy-duty milling and the project-oriented development of special cutting tool solutions, we offer a whole range of technology potential which is applied by the most various industries. The close cooperation with our customers for the development of technically demanding solutions for machining problems is the basis of long-term and durable partnerships – worldwide.

Small as well as medium-sized companies but also international enterprises trust our professional qualification and profit from the reliability and process security of our cutting tools.




Member IMC Group

RAPIDTHREAD TAPS

TAP DESIGNATION CODE KEY

ITGN	UNC	1/4-20	M	□	HE

Tap Style	
ITH	- hand tap
ITF	- forming tap
ITG	- gun point
ITS	- spiral flute
ITST	- straight flute

Thread Standard	
M	- ISO metric coars thread DIN-13
MF	- ISO metric fine thread DIN-13
UNC	- unfied coarse thread
UNF	- unfied fine thread

D	- TPI
D	- pitch

B - Bore for Coolant
(on request)

Coating Types*	
INHE	- uncoated
INHS	- uncoated
INHETI	- TiN PVD coated
INHENI	- nitrated
INHEST	- steam tempered
INPM	- Uncoated
INPMTC	- TiCN PVD coated
INPMTA	- TiAlN PVD coated
INPMST	- dampfgehärtet
INPMTI	- TiN PVD coated
INPMNI	- Nitrated
INHEDL	- DLC-coating
INHETA	- TiAlN PVD coated
INHETC	- TiCN PVD coated

Tap Color Codes[1]	
M	- Multi-Material application
W	- steel with good machinability Rm<750 N/mm²
S	- stainless steel
H	- hardened steel and high temp./super alloys Rm>750 N/mm²
G	- grey cast iron
N	- low alloy steel Rm<600 N/mm²
A	- aluminum and aluminum alloys
F	- any material with at least 8~10% elongation
Y	- nickel alloys

Tap Materials	
HS	- H.S.S. (M2)
HE	- H.S.S- E 5% Co. HSS (M35)
PM	- compacted powder
HM	- solid carbide

[1] **The tools have a matching colored ring around the shank**

Chamfer Lead According to DIN2197 (specified for each tool family)	
M	- **form a** (chamfer lead 5-6 threads)
W	- **form b** (with gun-nose and chamfer lead 4-5 threads)
S	- **form c** (chamfer lead 2-3 threads)
H	- **form d** (chamfer lead 4-5 threads)
G	- **form e** (chamfer lead 1.5-2 threads)
N	- **form f** (chamfer lead 1-1.5 threads)

TAP SURFACE TREATMENTS AND COATING TYPES

The high speed steels used by Ingersoll grant high wear resistance and toughness. For machining certain materials, various surface treatments are an advantage.

Dampfgehärtet(ST)

The dampfgehärtetis a Fe3O4 oxide coating which reduces the friction between the tool and workpiece and prevents cold welding.

Nitriding (NI)

Recommended surface treatment for machining hard wear/abrasive materials such as grey cast iron, aluminum alloys with high silicon percentage (more than 10%).

TiN Coating (TI)

The TiN coating has a hardness of approximately 2,300 HV and is temperature resistant up to approximately 600°C. This is an excellent golden colored coating for general applications.

TiCN-COATING – TiCN

TiCN takes place of TiN when the conditions require the coating to have a different hardness and toughness. The TiCN brings an advantage to machining very difficult steels or cutting interrupted bores. The TiCN-coating has a hardness of approx. 3,000 HV, but is temperature-resistant up to approx. 400° only. That means TiCN needs excellent cooling for long service life. Color: Blue-grey coefficient of friction against steel: 0.4

DLC-Coating

With its high wear resistance and slight adhesion on nonferrous metals DLC (Diamond-like carbon) coating is perfectly recommended for cutting Aluminium and Aluminium alloys

TiAlN-COATING – TiAlN

This is a special coating for machining abrasive materials such as: gray cast iron, alu-alloys with silicon, fiber reinforced plastics, etc., or machining under high temperatures, which means with insufficient cooling, or high speeds ≥ 600m/min. The TiAlN has a hardness of approx. 3,000 HV and is temperature resistant up to approx. 800°. Color: Violet-grey coefficient of friction against steel: 0.4

Hardslick-COATING – Hardslick

Hardslick combines in a novel way the advantages of an extremely hard, thermally stable TiAlN-coating with the sliding and lubricating properties of an outer WC/C (Tungsten carbide/carbon) coating. The hardslick coating has a hardness of approx. 3,000 HV and is temperature-resistant up to approx. 800°.
Color: Violet-grey coefficient of friction against steel: 0.2

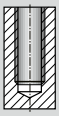
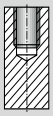
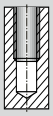
Tolerances According to DIN EN 22857

Intended for taps with ISO metric threads. The following chart gives a comparison between the new standard DIN EN 22857 and the withdrawn standard DIN 802 part 1. An important change is the re-classification from tap tolerance to tap application class.

Application class for taps to DIN EN 22857		Tolerance class to withdrawn standard DIN 802 Part 1	Allotment of the tolerance zones of the nut thread to Be Cut				
class 1	ISO 1	4H	4H	5H	-	-	-
class 2	ISO 2	6H	5G	5G	6H	-	-
class 3	ISO 3	6G	-	-	6G	7H	8H
-	-	7G	-	-	-	7G	8G

A suitable transition period is to be expected.
Codes for tolerance classes 7G/8G and <X> tolerance zones have yet to be standardized within DIN EN 22857, and the values from DIN 802 part will remain valid.

TAP SELECTION GUIDE AND CUTTING SPEED RECOMMENDATIONS

Material No.	Hole Type [4]					tap color code [1]
						tool material [1]
						surface treatment/coating [2]
						flute hand and angle
						lead according to DIN 2197 [3]
	1	2	3	4	5	Hole Type [4]
	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Chip / Coolant
1	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	Ext. Long / T
2		≥0.25% C	annealed	650	190	Medium / T
3		<0.55% C	quenched and tempered	850	250	Long / T
4		≥0.55% C	annealed	750	220	Long / T
7	low alloy and cast steel (less than 5% of alloying elements)		quenched and tempered	930	275	Long / X
8				1000	300	Long / X
9				1200	350	Long / A
10	high alloyed steel, cast steel and tool steel		annealed	680	200	Long / X
11			quenched and tempered	1100	325	Long / X
12	stainless steel and cast steel		ferritic/martensitic	680	200	Medium / A
13			martensitic	820	240	Long / A
14	stainless steel and cast steel		austenitic, duplex	600	180	Long / A
15	gray cast iron (gg)		ferritic / pearlitic		180	Ext. Short / X
16			pearlitic / martensitic		260	Ext. Short / X
17	nodular cast iron (ggg)		ferritic		160	Short / X
18			pearlitic		250	Ext. Short / X
19	malleable cast iron		ferritic		130	Short / X
20			pearlitic		230	Short / X
21	aluminum-wrought alloys		not hardenable		60	Medium / T
22			hardenable		100	Medium / T
23	aluminum-cast alloys	≤12% Si	not hardenable		75	Short / T
24			hardenable		90	Short / T
25		>12% Si	high temperature		130	Short / T
26	copper alloys	>1% Pb	free cutting		110	Med/Short / T
27			brass		90	Long / T
28			electrolytic copper		100	Long / T
29	non metallic		duroplastics, fiber plastics		70 Shore D	Short / Z
31	high temperature alloys	Fe based	annealed		200	Long / A
32			hardened		280	Long / A
33		Ni or Co based	annealed		250	Long / A
34			hardened		350	Long / A
35			cast		320	Long / A
36	titanium alloys		pure	400	190	Med/Short / A
37			alpha+beta alloys, hardened	1050	310	Med/Short / A

[1] See page 6
[2] See page 7
[3] See page 12
[4] See page 10

coolant
A - cutting oil
T - oil emulsion
X - oil or emulsion
Z - dry or emulsion

TAP SELECTION GUIDE AND CUTTING SPEED RECOMMENDATIONS

$W_{(1)}$	M	M	M	M	M	M	S	H	N	H	G	F
HSS	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
-	-	TI	ST	-	TI	ST	ST	-	ST	ST	NI	TI
-	-	-	-	R40°	R40°	R40°	-	-	R40°	R40°	-	-
1\2\3	B	B	B	C	C	C	B	B	C	C	C	C
1-2-3-4-5	4-5	4-5	4-5	1-2-3	1-2-3	1-2-3	4-5	4-5	1-2-3	1-2-3	1-2-3-4-5	1-2-3-4-5
m/min	m/min	m/min	m/min	m/min	m/min	m/min	m/min	m/min	m/min	m/min	m/min	m/min
•	10-25	15-45	8-25	20-25	15-45	8-25		20-25	8-25	20-25		20-60
••	10-20	12-40	10-35	15-20	12-40	10-35		15-20	10-35	15-20		20-60
••	12-18	15-25	6-12	12-18	15-25	6-12		12-18		12-18		17-55
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••	3-5	5-20	3-5	3-5	5-20	3-5		3-5		3-5		
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•	2-4	4-8		2-4	3-7			2-4		2-4		
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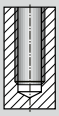
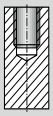
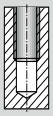
•	2-4	4-8		2-4	3-7			2-4		2-4		
••	6-10			6-10				6-10		6-10		
•	6-10			6-10				6-10		6-10		

• Recommended
•• Suitable
(1) Hand Tap

TAP SELECTION GUIDE AND CUTTING SPEED RECOMMENDATIONS

Material No.	Hole Type [4]					tap color code [1]
						tool material [1]
						surface treatment/coating [2]
						flute hand and angle
						lead according to DIN 2197 [3]
	1	2	3	4	5	Hole Type [4]
	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Chip / Coolant
1	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	61	125	Ext. Long / T
2		≥0.25% C	annealed	94	190	Medium / T
3		<0.55% C	quenched and tempered	123	250	Long / T
4		≥0.55% C	annealed	109	220	Long / T
7	low alloy and cast steel (less than 5% of alloying elements)		quenched and tempered	135	275	Long / X
8				145	300	Long / X
9				174	350	Long / A
10	high alloyed steel, cast steel and tool steel		annealed	99	200	Long / X
11			quenched and tempered	160	325	Long / X
12	stainless steel and cast steel		ferritic/martensitic	99	200	Medium / A
13			martensitic	119	240	Long / A
14	stainless steel and cast steel		austenitic, duplex	87	180	Long / A
15	gray cast iron (gg)		ferritic / pearlitic		180	Ext. Short / X
16			pearlitic / martensitic		260	Ext. Short / X
17	nodular cast iron (ggg)		ferritic		160	Short / X
18			pearlitic		250	Ext. Short / X
19	malleable cast iron		ferritic		130	Short / X
20			pearlitic		230	Short / X
21	aluminum-wrought alloys		not hardenable		60	Medium / T
22			hardenable		100	Medium / T
23	aluminum-cast alloys	≤12% Si	not hardenable		75	Short / T
24			hardenable		90	Short / T
25		>12% Si	high temperature		130	Short / T
26	copper alloys	>1% Pb	free cutting		110	Med/Short / T
27			brass		90	Long / T
28			electrolytic copper		100	Long / T
29	non metallic		duroplastics, fiber plastics		70 Shore D	Short / Z
31	high temperature alloys	Fe based	annealed		200	Long / A
32			hardened		280	Long / A
33		Ni or Co based	annealed		250	Long / A
34			hardened		350	Long / A
35			cast		320	Long / A
36	titanium alloys		pure	58	190	Med/Short / A
37			alpha+beta alloys, hardened	152	310	Med/Short / A

[1] See page 6
[2] See page 7
[3] See page 12
[4] See page 10

coolant
A - cutting oil
T - oil emulsion
X - oil or emulsion
Z - dry or emulsion

TAP SELECTION GUIDE AND CUTTING SPEED RECOMMENDATIONS

W(1)	M	M	M	M	M	M	S	H	N	H	G	F
HSS	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
-	-	TI	ST	-	TI	ST	ST	-	ST	ST	NI	TI
-	-	-	-	R40°	R40°	R40°	-	-	R40°	R40°	-	-
1\2\3	B	B	B	C	C	C	B	B	C	C	C	C
1-2-3-4-5	4-5	4-5	4-5	1-2-3	1-2-3	1-2-3	4-5	4-5	1-2-3	1-2-3	1-2-3-4-5	1-2-3-4-5
SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM
•	35-80 ••	15-150 •	25-80 ••	65-80 ••	50-150 •	25-80 ••		65-80 ••	25-80 •	65-80 ••		65-195
•	35-65 ••	40-130 •	35-115 ••	60-65 ••	40-130 •	35-115 ••		50-65 ••	35-115 ••	50-65 ••		65-195
•	40-60 ••	50-80 •	20-40 ••	40-60 ••	50-80 •	20-40 ••		40-60 ••		40-60 ••		55-180
•	40-60 ••	50-130 •	20-65 ••	40-60 ••	50-130 •	15-35 ••		40-60 ••		40-60 ••		55-180
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•	35-50 ••	50-150 ••	45-65 •	35-50 ••	50-150 ••	45-65 •				35-50 ••	35-100 •	
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•	25-40 ••	35-65 ••	70-100 •	25-40 ••	35-65 ••	70-100 •				25-40 ••	35-100 •	
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•	80-115 •	165-230 •	40-80 ••	80-115 •	100-195 •	40-80 ••			40-80 ••	80-115 ••		
•	80-115 •	165-230 •	40-80 ••	80-115 •	100-195 •	40-80 ••			40-80 ••	80-115 ••		
•	35-50 •	35-130 •	35-80 ••	35-50 •	50-130 •	35-80 ••			35-80 ••	35-50 ••		
•	35-50 •	35-100 •	35-80 ••	35-50 •	50-130 •	35-80 ••			35-80 ••	35-50 ••		
•	35-50 •	35-100 •	35-65 ••	35-50 •	50-100 •	35-65 ••			35-65 ••	35-50 ••		
•	80-115 •	65-230 •	65-130 ••	80-115 •	100-215 •	65-130 ••			65-130 ••	80-115 ••		55-130
•	50-65 •	15-195 •	45-100 ••	50-65 •	65-150 •	45-100 ••			45-100 ••	50-65 ••		65-195
•	50-65 •	15-80 •	35-55 ••	50-65 •	50-100 •	35-55 ••			35-55 ••	50-65 ••		65-195
•	20-35 •	15-80 •	25-45 ••	20-35 •	35-65 •	20-45 ••			20-45 ••	20-35 ••		
•	5-15 ••	15-25 •		5-15 •	10-25 ••			5-15		5-15 •		
•	5-15 ••	15-25 •		5-15	10-25 ••			5-15		5-15 •		
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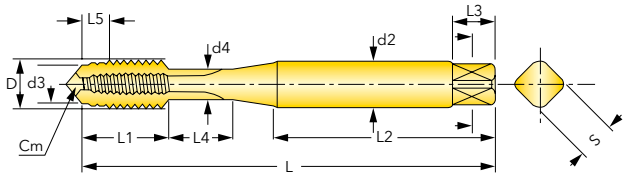
•	5-15 ••	15-25 •		5-15	10-25 ••			5-15		5-15 •		
•	20-35 ••			20-35 ••				20-35		20-35 •		
•	20-35 •			20-35 ••				20-35		20-35 •		

• Recommended
• • Suitable
(1) Hand Tap

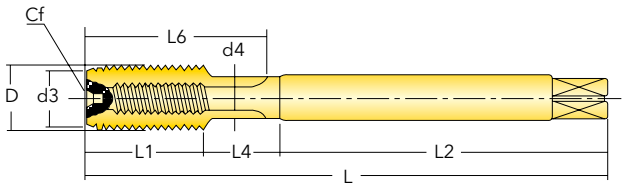
TAP NOMENCLATURE AND STANDARDS

DIN 371



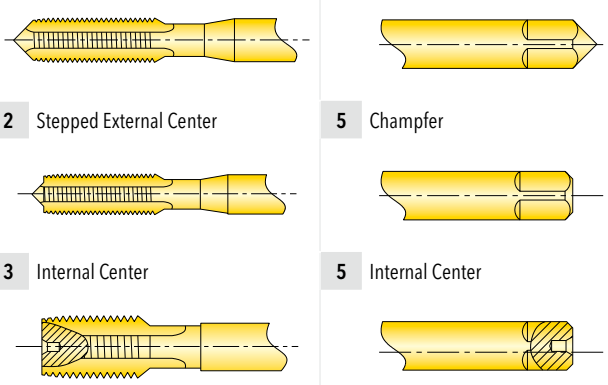
D	- major diameter	**d3**	- chamfer diameter
d2	- shank diameter	**d4**	- neck diameter

DIN 376

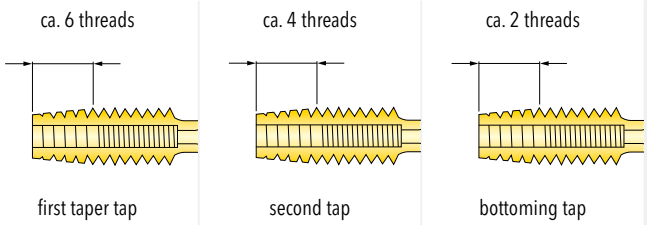


L	- total length	**L5**	- chamfer length
L1	- thread length	**L6**	- flute length
L2	- shank length	**S**	- square size
L3	- square length	**Cm**	- center male
L4	- neck length	**Cf**	- center female

Front End	Shank End
1 External Center	**4** External Center
2 Stepped External Center	**5** Champfer
3 Internal Center	**5** Internal Center

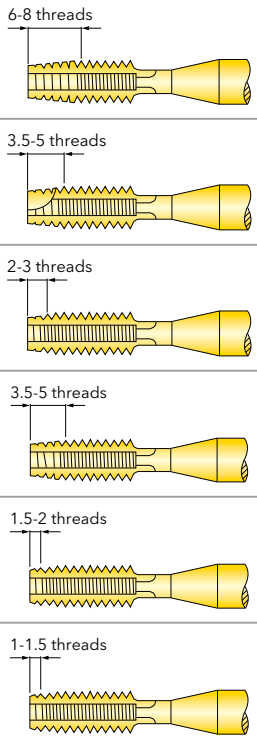


Chamfer Lead Length for Sets of 3 Hand Tap



Thread Dia. Range (mm)	Front End	Shank End	Tap Standard
≤Ø6	1	4 5	DIN352
Ø7	1 2	4 5 6	DIN371
≥Ø8	1 2 3	5 6	DIN376

Chamfer Lead Forms According to DIN 2197



A — **Form A**
long, 6-8 threads for short through holes.

B — **Form B**
medium, 3.5-5 threads, with spiral point for all through holes and deep tapping holes.

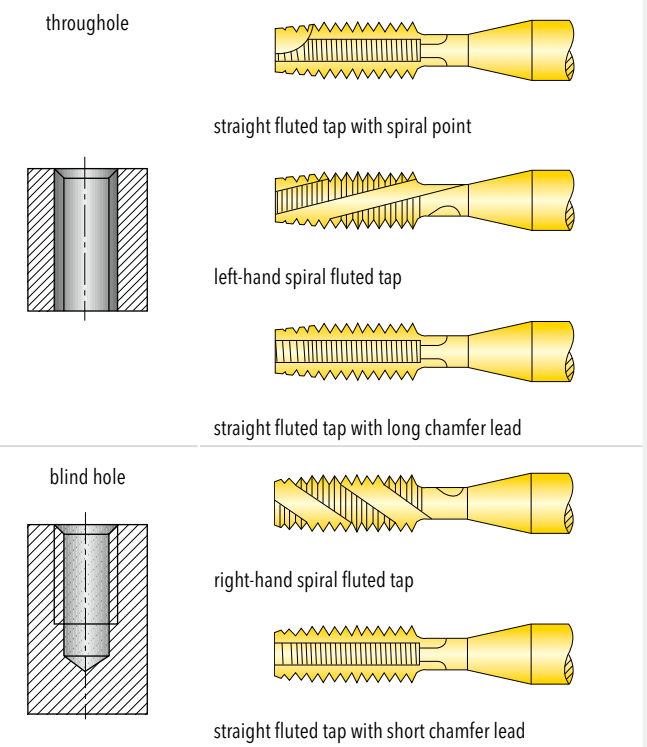
C — **Form C**
long, 2-3 threads for blind holes and generally for aluminum grey cast iron and brass.

D — **Form D**
medium, 3.5-5 threads for through and blind holes with sufficient runout.

E — **Form E**
extremely short, 1.5-2 threads for blind holes with little runout depth. Avoid use if possible.

F — **Form F**
extremely short, 1-1.5 threads for blind holes with little runout depth. Avoid use if possible.

Tap Styles for Hole Types



Front and end configurations according to DIN2197

PRE-TAPPING HOLE SIZES (TAPPING)

ISO Metric Threads Coarse Pitch			
M	Pitch mm	Max Core Dia.mm	Drill Size mm
1	0.25	0.785	0.75
1.1	0.25	0.885	0.85
1.2	0.25	0.985	0.95
1.4	0.30	1.160	1.10
1.6	0.35	1.321	1.25
1.7	0.35	1.346	1.30
1.8	0.35	1.521	1.45
2	0.40	1.679	1.60
2.2	0.45	1.838	1.75
2.3	0.40	1.920	1.90
2.5	0.45	2.138	2.05
2.6	0.45	2.176	2.10
3	0.50	2.599	2.50
3.5	0.60	3.010	2.90
4	0.70	3.422	3.30
4.5	0.75	3.878	3.70
5	0.80	4.334	4.20
6	1.00	5.153	5.00
7	1.00	6.153	6.00
8	1.25	6.912	6.80
9	1.25	7.912	7.80
10	1.50	8.676	8.50
11	1.50	9.676	9.50
12	1.75	10.441	10.20
14	2.00	12.210	12.00
16	2.00	14.210	14.00
18	2.50	15.744	15.50
20	2.50	17.744	17.50
22	2.50	19.744	19.50
24	3.00	21.252	21.00
27	3.00	24.252	24.00
30	3.50	26.771	26.50
33	3.50	29.771	29.50
36	4.00	32.270	32.00
39	4.00	35.270	35.00
42	4.50	37.799	37.50
45	4.50	40.799	40.50
48	5.00	43.297	43.00
52	5.00	47.297	47.00
56	5.50	50.796	50.50
60	5.50	54.796	54.50
64	6.00	58.305	58.00
68	6.00	62.305	62.00

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
2.5	0.35	2.221	2.15
3	0.35	2.271	2.65
3.5	0.35	3.221	3.15
4	0.50	3.599	3.50
4.5	0.50	4.099	4.00
5	0.50	4.599	4.50
5.5	0.50	5.099	5.00
6	0.75	5.378	5.20
7	0.75	6.378	6.20
8	0.75	7.378	7.20
8	1.00	7.153	7.00
9	0.75	8.378	8.20
9	1.00	8.153	8.00
10	0.75	9.378	9.20
10	1.00	9.153	9.00
10	1.25	8.912	8.80
11	0.75	10.378	10.20
11	1.00	10.153	10.00
12	1.00	11.153	11.00
12	1.25	10.912	10.80
12	1.50	10.676	10.50
14	1.00	13.153	13.00
14	1.25	12.912	12.80
14	1.50	12.676	12.50
15	1.00	14.153	14.00
15	1.50	13.676	13.50
16	1.00	15.153	15.00
16	1.50	14.676	14.50
17	1.00	16.153	16.00
17	1.50	15.676	15.50
18	1.00	17.153	17.00
18	1.50	16.676	16.50
18	2.00	16.210	16.00
20	1.00	19.153	19.00
20	1.50	18.676	18.50
20	2.00	18.210	18.00
22	1.00	21.153	21.00
22	1.50	20.676	20.50
22	2.00	20.210	20.00
24	1.00	23.153	23.00
24	1.50	22.676	22.50
24	2.00	22.210	22.00
25	1.00	24.153	24.00
25	1.50	23.676	23.50

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
25	2.00	23.210	23.00
26	1.50	24.676	24.50
27	1.00	26.153	26.00
27	1.50	25.676	25.50
27	2.00	25.210	25.00
28	1.00	27.153	27.00
28	1.50	26.676	26.50
28	2.00	26.210	26.00
30	1.00	29.153	29.00
30	1.50	28.676	28.50
30	2.00	28.210	28.00
30	3.00	27.252	27.00
32	1.50	30.675	30.50
32	2.00	30.210	30.00
33	1.50	31.676	31.50
33	2.00	31.210	31.00
33	3.00	30.252	30.00
35	1.50	33.676	33.50
36	1.50	34.676	34.50
36	2.00	34.210	34.00
36	3.00	33.252	33.00
38	1.50	36.676	36.50
39	1.50	37.676	37.50
39	2.00	37.210	37.00
39	3.00	36.252	36.00
40	1.50	38.676	38.50
40	2.00	38.210	38.00
40	3.00	37.252	37.00
42	1.50	40.676	40.50
42	2.00	40.210	40.00
42	3.00	39.252	39.00
45	1.50	43.676	43.50
45	2.00	43.210	43.00
45	3.00	42.252	42.00
48	1.50	46.676	46.50
48	2.00	46.210	46.00
48	3.00	45.252	45.00
50	1.50	48.676	48.50
50	2.00	48.210	48.00
50	3.00	47.252	47.00
52	1.50	50.676	50.50
52	2.00	50.210	50.00
52	3.00	49.252	49.00

PRE-TAPPING HOLE SIZES (FORMING)

Recommended Tap Drill Size		
M	Pitch mm	Drill Size mm
1	0.25	0.9
1.1	0.25	1
1.2	0.25	1.1
1.4	0.3	1.28
1.6	0.35	1.47
1.7	0.35	1.57
1.8	0.35	1.67
2	0.4	1.85
2.2	0.45	2.03
2.3	0.4	2.15
2.5	0.45	2.33
2.6	0.45	2.43
3	0.5	2.8
3.5	0.6	3.25
4	0.7	3.7
4.5	0.75	4.2
5	0.8	4.65
6	1	5.55
7	1	6.55
8	1.25	6.6
9	1.25	7.45
10	1.5	8.45
11	1.5	9.35
12	1.75	11.25
14	2	13.1
16	2	15.1
18	2.5	16.85
20	2.5	18.85
22	2.5	20.85
24	3	22.65
27	3	25.65
30	3.5	28.4
33	3.5	31.4
36	4	34.15
39	4	37.15
42	4.5	39.9
45	4.5	42.9
48	5	45.65

Recommended Tap Drill Size		
MF	Pitch mm	Drill Size mm
2.5	0.35	2.37
2.6	0.35	2.47
3	0.35	2.88
3.5	0.35	3.38
4	0.5	3.8
5	0.5	4.8
6	0.5	5.8
6	0.75	5.7
7	0.75	6.7
8	0.75	7.7
8	1	7.6
9	0.75	8.7
9	1	8.6
10	0.75	9.7
10	1	9.6
10	1.25	9.45
11	1	10.6
12	1	11.6
12	1.25	11.45
12	1.5	11.35
14	1	13.6
14	1.25	13.45
14	1.5	13.35
15	1	14.6
15	1.5	14.35
16	1	15.6
16	1.5	15.35
18	4	17.6
18	1.5	17.35
18	2	17.1
20	1	19.6
20	1.5	19.35
20	2	19.1
24	2	23.1
30	2	29.1
36	3	34.65
42	4	40.15
48	3	46.65

PRE-TAPPING HOLE SIZES (TAPPING)

American Unified Coarse Threads			
UN / UNC	T.P.I.	Max. Core Dia. Inch	Drill Size mm
#1	64	1.585	1.5
#2	56	1.872	1.8
#3	48	2.146	2.1
#4	40	2.385	2.3
#5	40	2.697	2.6
#6	32	2.896	2.85
#8	32	3.528	3.5
#10	24	3.95	3.9
#12	24	4.59	4.5
1/4"	20	5.25	5.2
5/16"	18	6.68	6.6
3/8"	16	8.082	8
7/16"	14	9.441	9.4
1/2"	13	10.881	10.75
9/16"	12	12.301	12.25
5/8"	11	13.693	13.5
3/4"	10	16.624	16.5
7/8"	9	19.52	19.5
1"	8	22.344	22.25
1 1/8"	7	25.082	25
1 1/4"	7	28.258	28.25
1 3/8"	6	30.851	30.75
1 1/2"	6	34.026	34
1 3/4"	5	39.56	39.5
2"	4.5	45.367	45.25

American Unified Feingewinde			
UNF	T.P.I.	Max. Core Dia. Inch	Drill Size mm
#0	80	1.306	1.3
#1	72	1.613	1.6
#2	64	1.913	1.9
#3	56	2.197	2.1
#4	48	2.459	2.4
#5	44	2.741	2.7
#6	40	3.012	3
#8	36	3.597	3.5
#10	32	4.168	4.1
#12	28	4.717	4.7
1/4"	28	5.563	5.5
5/16"	24	6.995	6.9
3/8"	24	8.565	8.5
7/16"	20	9.947	9.9
1/2"	20	11.524	11.5
9/16"	18	12.969	12.9
5/8"	18	14.554	14.5
3/4"	16	17.546	17.5
7/8"	14	20.493	20.5
1"	12	23.363	23.25
1 1/8"	12	26.538	26.5
1 1/4"	12	29.713	29.5
1 3/8"	12	32.888	32.7
1 1/2"	12	36.063	36

FOR OPTIMUM TAPPING CONDITIONS, REDUCED MACHINING TIMES AND INCREASED TAP LIFE

Selection of the Most Suitable Tap

As a general rule, materials with deformation capability of at least 10% can be cold-formed. To decide on the most suitable tap, please refer to the tap recommendation table on pages 4-5.

Pre-Tapping Holes

Check that the holes are within the prescribed size range depending on the application (see table on pages 11-13). The holes should be clean and swarf-free.

Lubrication

Frequently the lubricant content of the coolant used for general machining is too low for tapping

- If it is not possible to increase the lubricant content, following are some possible solutions:
- A separate lubricating unit can be connected to the machine control, to deliver the required quantity of concentrated emulsion into the core hole or onto the tap. Tapping in separate operations allows the use of the ideal tapping lubricant.

Tapping Speeds

The tapping speed has a great influence on chip flow and the life of the tap. It is worthwhile to establish the ideal speed by tapping trials. For recommended initial values, see table on page 9. In addition, the following should be taken into consideration: characteristics of the material, machine and clamping method.

Effects of Unsuitable Tapping Speed

- forced tapping.
- tap lead chipping caused by overloaded cutting tooth.
- torn threads.
- unsatisfactory tap life.
- rejected threads.

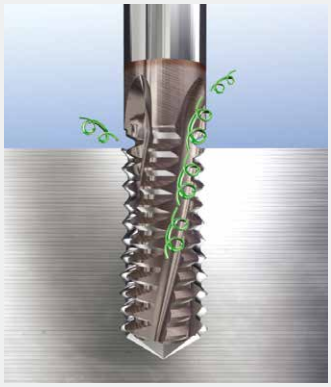
Chip Explusion

Tap selection is also influenced by the type of hole being threaded. Through hole tapping usually requires a tap that pushes the chips out in front of the cutting edge and through the other end of the hole. A bottom hole tap must pull chips up and out of the hole.

Tap Jamming

Some possible causes of tap jamming are:

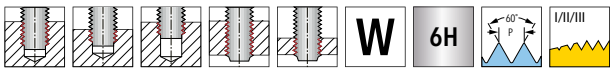
- Unsuitable tap.
- Tap with incorrect cutting geometry.
- Unsuitable coolant for material.
- Insufficient coolant.
- Axial pressure (pull or push) on the tap.
- Core hole too small.
- Breaks in walls of core hole.
- Speed too high or too low.
- Swarf trapped in the hole.
- Incorrect alignment of tap and core hole.
- Tap eccentricity.

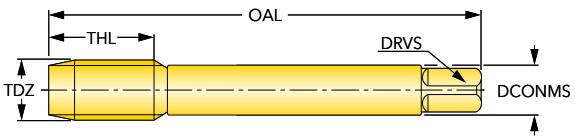


Troubleshooting

Problem	Cause	Solution
Tapped hole oversized	incorrect tap (cutting geometry unsuitable for application)	use tap selected from the relevant material group
	faulty alignment	ensure that the tap is correctly aligned with the core hole axis
	tap jamming	improve lubrication and direction of coolant adjust cutting speed
	incorrectly reground tap (lead tip is not concentric)	regrind tap
Stripped threads	incorrect tap (cutting geometry incorrect for application)	use a tap from the relevant material group
	spindle speed and feed rate are not synchronized	check feed rate programming and/or pitch of leading spindle. use a tapping spindle with axial float (gti/gtin)
	insufficient starting pressure exerted on tap (causes peeling)	increase starting pressure
Bell mouthed tapped hole	incorrect starting pressure	use a tapping spindle with axial float (gti/gtin)
Unsatisfactory thread surface finish	incorrect tap (cutting geometry unsuitable for application)	select tap for the relevant material group
	the tap is blunt	replace or regrind tap
	tap badly re-ground	regrind tap, check that cutting geometry is suitable for material
	incorrect lubricant, concentration or quantity	ensure the use of a suitable coolant and an ample supply
Partial chipping of tap	swarf jamming	check cutting speed. use alternative tap
	tap has jammed against bottom of pre-hole	check hole and thread depths. drill a deeper pre-hole
	tap incorrectly reground (lead-in diameter too short, therefore too few cutting teeth)	ensure that correct dimensions are maintained when regrinding
	irregular workpiece material structure	adjust cutting speed. improve lubricant quality of coolant
Excessive tap wear	incorrect cutting speed	adjust cutting speed to suit workpiece material
	coolant lacking in lubricating qualities and/or quantity	ensure the use of a suitable coolant and an ample supply. check that the coolant is reaching the cutting zone
	surface of the pre-hole is compacted	check pre-hole drilling conditions (drill carefully to reduce risk of surface compacting). check drill cutting edges
Tap breakage	incorrect tap in use (cutting geometry unsuitable for application)	use tap from the relevant material group
	centering error	ensure that axes of tap and pre-hole are aligned
	blunt tap	regrind tap
	tap has reached bottom of pre-hole	use tapping spindle with axial float and slipping clutch (GTI/GTIN)
	pre-hole too small	check for correct pre-hole size, see pages 13-15

DIN 13 HSS HAND TAP SET FOR ISO METRIC COARSE THREADS





Designation	TDZ	TP(1)	OAL	THL	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	INHS
ITHN M-2X0.4-W	M2	0.400	36.00	8.0	2.80	3	2.10	1.60	DIN 352	•
ITHN M-2.2X0.45-W	M2.2	0.450	36.00	9.0	2.80	3	2.10	1.75	DIN 352	•
ITHN M-2.5X0.45-W	M2.5	0.450	40.00	9.0	2.80	3	2.10	2.05	DIN 352	•
ITHN M-3X0.5-W	M3	0.500	42.00	12.0	3.50	3	2.70	2.50	DIN 352	•
ITHN M-3.5X0.6-W	M3.5	0.600	45.00	14.0	4.00	3	3.00	2.90	DIN 352	•
ITHN M-4X0.7-W	M4	0.700	46.00	14.0	4.50	3	3.40	3.30	DIN 352	•
ITHN M-5X0.8-W	M5	0.800	50.00	16.0	6.00	3	4.90	4.20	DIN 352	•
ITHN M-6X1.0-W	M6	1.000	52.00	18.0	6.00	3	4.90	5.00	DIN 352	•
ITHN M-8X1.25-W	M8	1.250	63.00	18.0	6.00	3	4.90	6.80	DIN 352	•
ITHN M-10X1.5-W	M10	1.500	70.00	23.0	7.00	3	5.50	8.50	DIN 352	•
ITHN M-12X1.75-W	M12	1.750	75.00	28.0	9.00	3	7.00	10.20	DIN 352	•
ITHN M-14X2.0-W	M14	2.000	80.00	30.0	11.00	4	9.00	12.00	DIN 352	•
ITHN M-16X2.0-W	M16	2.000	80.00	30.0	12.00	4	9.00	14.00	DIN 352	•
ITHN M-18X2.5-W	M18	2.500	95.00	35.0	14.00	4	11.00	15.50	DIN 352	•
ITHN M-20X2.5-W	M20	2.500	95.00	34.0	16.00	4	12.00	17.50	DIN 352	•

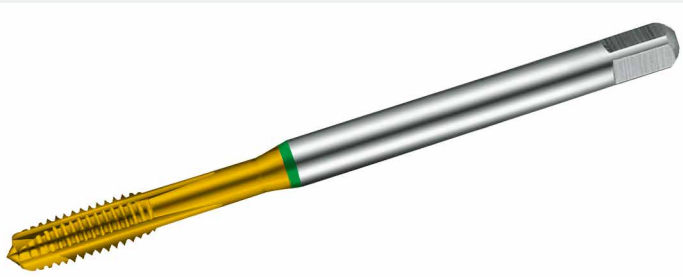
• NOTE: Each set contains 2 or 3 taps

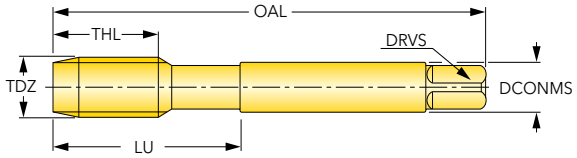
(1) Thread pitch

(2) Number of flutes

(3) Torque key size

DIN 13 HSSE 5% CO GUN POINT MACHINE TAPS -
ISO METRIC COARSE THREADS FOR A WIDE RANGE OF MATERIALS

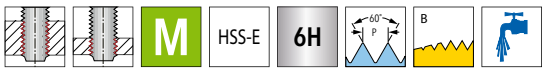


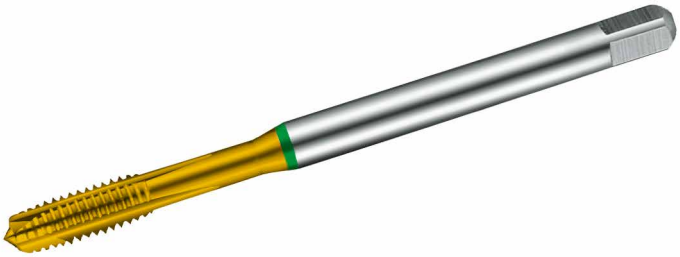


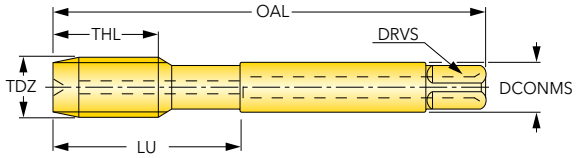
Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard	
											INHE	INHETI
ITGN M-2X0.4-M	M2	0.400	45.00	8.0	-	2.80	2	2.10	1.60	DIN 371	•	•
ITGN M-2.2X0.45-M	M2.2	0.450	45.00	9.0	-	2.80	2	2.10	1.75	DIN 371	•	•
ITGN M-2.5X0.45-M	M2.5	0.450	50.00	9.0	-	2.80	2	2.10	2.05	DIN 371	•	•
ITGN M-3X0.5-M	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
ITGN M-3.5X0.6-M	M3.5	0.600	56.00	10.0	20.0	4.00	3	3.00	2.90	DIN 371	•	•
ITGN M-4X0.7-M	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
ITGN M-5X0.8-M	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	•	•
ITGN M-6X1.0-M	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	•	•
ITGN M-8X1.25-M	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	•	•
ITGN M-10X1.5-M	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
ITGN M-12X1.75-M	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•	•
ITGN M-14X2.0-M	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•	•
ITGN M-16X2.0-M	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•	•
ITGN M-18X2.5-M	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•	•
ITGN M-20X2.5-M	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	•	•
ITGN M-22X2.5-M	M22	2.500	140.00	30.0	-	18.00	4	14.50	19.50	DIN 376	•	•
ITGN M-24X3.0-M	M24	3.000	160.00	36.0	-	18.00	4	14.50	21.00	DIN 376	•	•
ITGN M-27X3.0-M	M27	3.000	160.00	36.0	-	20.00	4	16.00	24.00	DIN 376	•	•
ITGN M-30X3.5-M	M30	3.500	180.00	40.0	-	22.00	4	18.00	26.50	DIN 376	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

DIN 13 HSS GUN POINT MACHINE TAPS - ISO METRIC COARSE THREADS FOR HARDENED STEEL AND H.T.A.



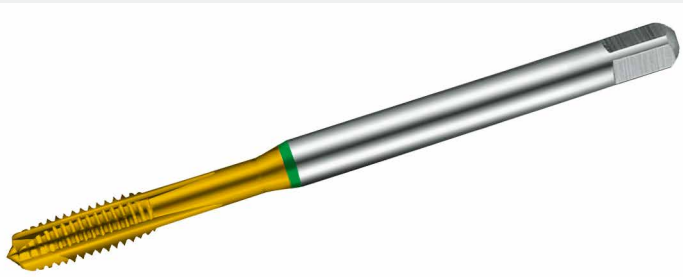


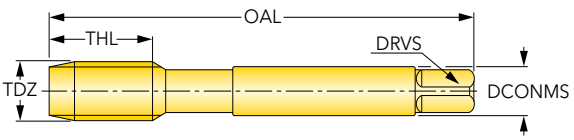


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	CSP[4]	Standard	INHETI
ITGN M-8X1.25-M-B	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	1	DIN 371	•
ITGN M-10X1.5-M-B	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	1	DIN 371	•
ITGN M-12X1.75-M-B	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	1	DIN 376	•
ITGN M-14X2.0-M-B	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	1	DIN 376	•
ITGN M-16X2.0-M-B	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	1	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size
[4] 0 - Without coolant supply, 1 - With coolant supply

DIN 13 HSSE 5% CO GUN POINT MACHINE TAPS - ISO METRIC FINE THREADS FOR A WIDE RANGE OF MATERIALS.

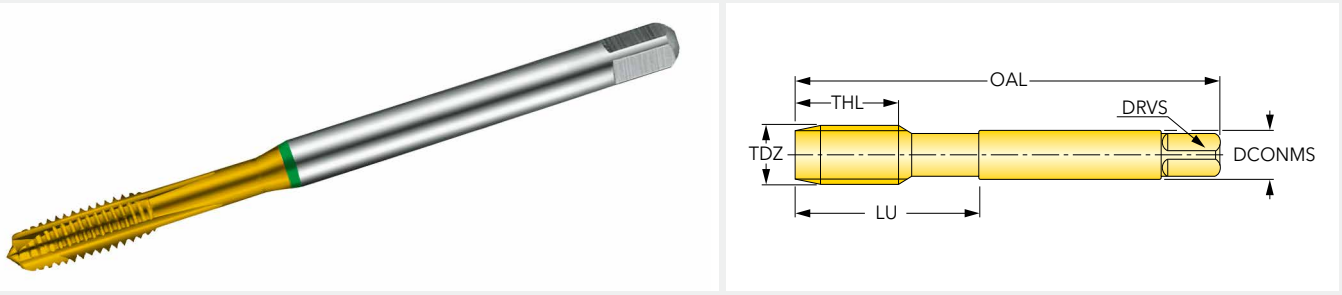




Designation	TDZ	TP[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard	
										INHE	INHETI
ITGN MF-4X0.5-M	MF4	0.500	63.00	10.0	2.80	3	2.10	3.50	DIN 374	•	•
ITGN MF-5X0.5-M	MF5	0.500	70.00	12.0	3.50	3	2.70	4.50	DIN 374	•	•
ITGN MF-6X0.75-M	MF6	0.750	80.00	12.0	4.50	3	3.40	5.20	DIN 374	•	•
ITGN MF-8X1.0-M	MF8	1.000	90.00	15.0	6.00	3	4.90	7.00	DIN 374	•	•
ITGN MF-10X1.0-M	MF10	1.000	90.00	18.0	7.00	3	5.50	9.00	DIN 374	•	•
ITGN MF-10X1.25-M	MF10	1.250	100.00	18.0	7.00	3	5.50	8.80	DIN 374	•	•
ITGN MF-12X1.0-M	MF12	1.000	100.00	18.0	9.00	4	7.00	11.00	DIN 374	•	•
ITGN MF-12X1.25-M	MF12	1.250	100.00	18.0	9.00	4	7.00	10.80	DIN 374	•	•
ITGN MF-12X1.5-M	MF12	1.500	100.00	18.0	9.00	4	7.00	10.50	DIN 374	•	•
ITGN MF-14X1.0-M	MF14	1.000	100.00	18.0	11.00	4	9.00	13.00	DIN 374	•	•
ITGN MF-14X1.25-M	MF14	1.250	100.00	18.0	11.00	4	9.00	12.80	DIN 374	•	•
ITGN MF-14X1.5-M	MF14	1.500	100.00	18.0	11.00	4	9.00	12.50	DIN 374	•	•
ITGN MF-16X1.5-M	MF16	1.500	100.00	18.0	12.00	4	9.00	14.50	DIN 374	•	•
ITGN MF-18X1.5-M	MF18	1.500	110.00	20.0	14.00	4	11.00	16.50	DIN 374	•	•
ITGN MF-20X1.5-M	MF20	1.500	125.00	24.0	16.00	4	12.00	18.50	DIN 374	•	•
ITGN MF-22X1.5-M	MF22	1.500	125.00	24.0	18.00	4	14.50	20.50	DIN 374	•	•
ITGN MF-24X1.5-M	MF24	1.500	140.00	24.0	18.00	4	14.50	22.50	DIN 374	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

HSSE 5% CO GUN POINT MACHINE TAPS -
UNIFIED COARSE THREADS FOR A WIDE RANGE OF MATERIALS.

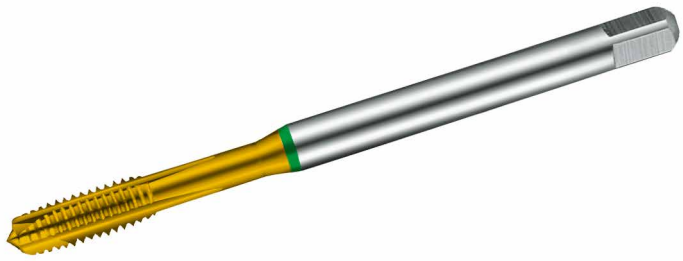


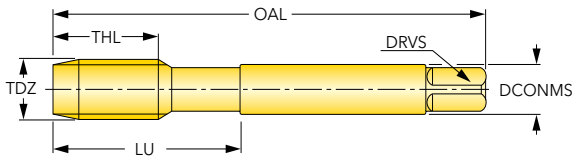
Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard	
											INHE	INHETI
ITGN UNC #4-40-M	UNC No.4	40.0	56.00	10.0	18.0	3.50	2	2.70	2.35	DIN 371	•	•
ITGN UNC #5-40-M	UNC No.5	40.0	56.00	10.0	18.0	3.50	3	2.70	2.65	DIN 371	•	•
ITGN UNC #6-32-M	UNC No.6	32.0	56.00	10.0	20.0	4.00	3	3.00	2.85	DIN 371	•	•
ITGN UNC #8-32-M	UNC No.8	32.0	63.00	12.0	21.0	4.50	3	3.40	3.50	DIN 371	•	•
ITGN UNC #10-24-M	UNC No.10	24.0	7.00	14.0	25.0	6.00	3	4.90	3.90	DIN 371	•	•
ITGN UNC #12-24-M	UNC No.12	24.0	80.00	16.0	30.0	6.00	3	4.90	4.50	DIN 371	•	•
ITGN UNC 1/4-20-M	UNC 1/4	20.0	80.00	16.0	30.0	7.00	3	5.50	5.10	DIN 371	•	•
ITGN UNC 5/16-18-M	UNC 5/16	18.0	90.00	18.0	35.0	8.00	3	6.20	6.60	DIN 371	•	•
ITGN UNC 3/8-16-M	UNC 3/8	16.0	100.00	20.0	39.0	10.00	3	8.00	8.00	DIN 371	•	•
ITGN UNC 7/16-14-M	UNC 7/16	14.0	100.00	20.0	-	8.00	4	6.20	9.40	DIN 376	•	•
ITGN UNC 1/2-13-M	UNC 1/2	13.0	110.00	22.0	-	9.00	4	7.00	10.80	DIN 376	•	•
ITGN UNC 9/16-12-M	UNC 9/16	12.0	110.00	24.0	-	11.00	4	9.00	12.20	DIN 376	•	•
ITGN UNC 5/8-11-M	UNC 5/8	11.0	110.00	26.0	-	12.00	4	9.00	13.50	DIN 376	•	•
ITGN UNC 3/4-10-M	UNC 3/4	10.0	125.00	30.0	-	14.00	4	11.00	16.50	DIN 376	•	•
ITGN UNC 7/8-9-M	UNC 7/8	9.0	140.00	30.0	-	18.00	4	14.50	19.50	DIN 376	•	•
ITGN UNC 1"-8-M	UNC 1"	8.0	160.00	36.0	-	18.00	4	14.50	22.25	DIN 376	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

ITGN UNF-M

HSSE 5% CO SPIRAL FLUTE MACHINE TAPS -
UNIFIED FINE THREADS, FOR A WIDE RANGE OF MATERIALS.

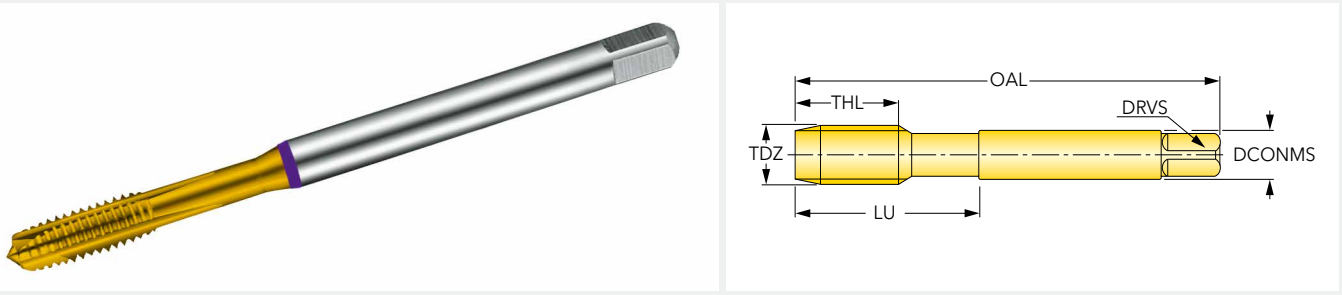




Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard	
											INHE	INHETI
ITGN UNF #4-48-M	UNF No.4	48.0	56.00	8.0	18.0	3.50	2	2.70	2.40	DIN 371	•	•
ITGN UNF #5-44-M	UNF No.5	44.0	56.00	9.0	18.0	3.50	3	2.70	2.70	DIN 371	•	•
ITGN UNF #6-40-M	UNF No.6	40.0	56.00	10.0	20.0	4.00	3	3.00	2.95	DIN 371	•	•
ITGN UNF #8-36-M	UNF No.8	36.0	63.00	12.0	21.0	4.50	3	3.40	3.50	DIN 371	•	•
ITGN UNF #10-32-M	UNF No.10	32.0	70.00	12.0	25.0	6.00	3	4.90	4.10	DIN 371	•	•
ITGN UNF #12-28-M	UNF No.12	28.0	80.00	12.0	30.0	6.00	3	4.90	4.60	DIN 371	•	•
ITGN UNF 1/4-28-M	UNF 1/4	28.0	80.00	12.0	30.0	7.00	3	5.50	5.50	DIN 371	•	•
ITGN UNF 5/16-24-M	UNF 5/16	24.0	90.00	15.0	35.0	8.00	3	6.20	6.90	DIN 371	•	•
ITGN UNF 3/8-24-M	UNF 3/8	24.0	90.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
ITGN UNF 7/16-20-M	UNF 7/16	20.0	100.00	18.0	-	8.00	4	6.20	9.90	DIN 376	•	•
ITGN UNF 1/2-20-M	UNF 1/2	20.0	100.00	18.0	-	9.00	4	7.00	11.50	DIN 376	•	•
ITGN UNF 9/16-18-M	UNF 9/16	18.0	100.00	18.0	-	11.00	4	9.00	12.90	DIN 376	•	•
ITGN UNF 5/8-18-M	UNF 5/8	18.0	100.00	18.0	-	12.00	4	9.00	14.50	DIN 376	•	•
ITGN UNF 3/4-16- M	UNF 3/4	16.0	110.00	24.0	-	14.00	4	11.00	17.50	DIN 376	•	•
ITGN UNF 7/8 -14-M	UNF 7/8	14.0	125.00	24.0	-	18.00	4	14.50	20.50	DIN 376	•	•
ITGN UNF 1"-12-M	UNF 1"	12.0	140.00	28.0	-	18.00	4	14.50	23.25	DIN 376	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

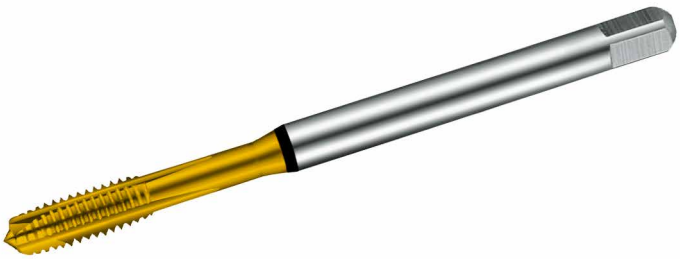
PM GUN POINT MACHINE TAPS ACCORDING TO DIN 13 - ISO METRIC COARSE THREADS ON STEEL WITH GOOD MACHINABILITY.

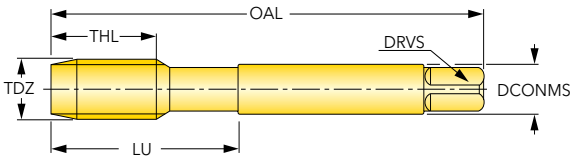


Designation	TDZ	TP(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	Tough ◄► Hard	
											INPMST	INPMTC
ITGN M-2X0.4-S	M2	0.400	45.00	8.0	39.0	2.80	2	2.10	1.60	DIN 371	•	•
ITGN M-2.5X0.45-S	M2.5	0.450	50.00	9.0	30.0	2.80	2	2.10	2.05	DIN 371	•	•
ITGN M-3X0.5-S	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
ITGN M-4X0.7-S	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
ITGN M-5X0.8-S	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	•	•
ITGN M-6X1.0-S	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	•	•
ITGN M-8X1.25-S	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	•	•
ITGN M-10X1.5-S	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
ITGN M-12X1.75-S	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•	•
ITGN M-14X2.0-S	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•	•
ITGN M-16X2.0-S	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•	•
ITGN M-18X2.5-S	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•	•
ITGN M-20X2.5-S	M20	2.500	140.00	30.0	21.0	16.00	4	12.00	17.50	DIN 376	•	•

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

DIN 13 HSSE 5% CO GUN POINT MACHINE TAPS -
ISO METRIC COARSE THREADS FOR MACHINING ALUMINUM.

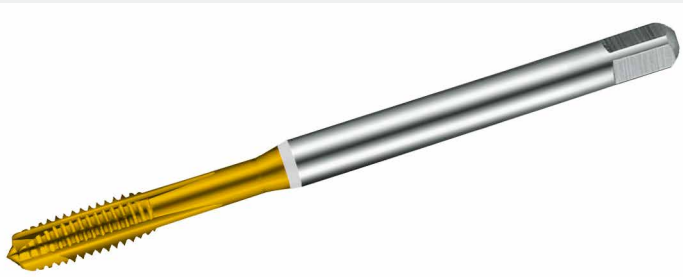


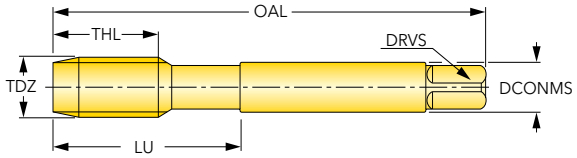


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	INHEDL
ITGN M-2X0.4-A	M2	0.400	45.00	8.0	-	2.80	2	2.10	1.60	DIN 371	•
ITGN M-3X0.5-A	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•
ITGN M-4X0.7-A	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•
ITGN M-5X0.8-A	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	•
ITGN M-6X1.0-A	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	•
ITGN M-8X1.25-A	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	•
ITGN M-10X1.5-A	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	•
ITGN M-12X1.75-A	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•
ITGN M-14X2.0-A	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•
ITGN M-16X2.0-A	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•
ITGN M-18X2.5-A	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•
ITGN M-20X2.5-A	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

DIN 13 HSSE 5% CO GUN POINT MACHINE TAPS -
ISO METRIC COARSE THREADS FOR MACHINING CAST IRON.

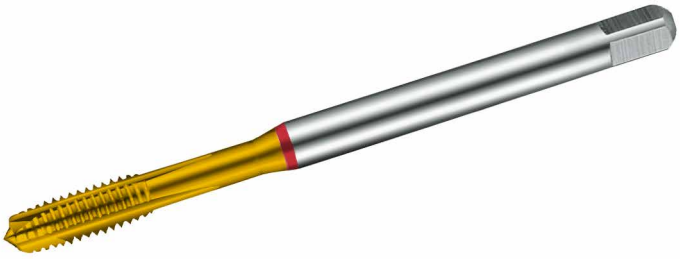


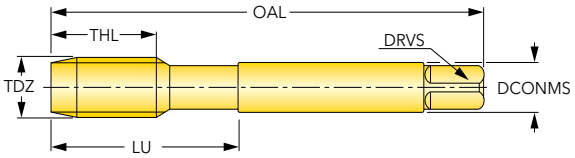


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	INHETA
ITGN M-3X0.5-G	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•
ITGN M-4X0.7-G	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•
ITGN M-5X0.8-G	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	•
ITGN M-6X1.0-G	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	•
ITGN M-8X1.25-G	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	•
ITGN M-10X1.5-G	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	•
ITGN M-12X1.75-G	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•
ITGN M-14X2.0-G	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•
ITGN M-16X2.0-G	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•
ITGN M-18X2.5-G	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•
ITGN M-20X2.5-G	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

DIN 13 HSSE 5% CO GUN POINT MACHINE TAPS -
ISO METRIC COARSE THREADS, FOR HARDENED STEEL AND HIGH TEMPERATURE ALLOYS.

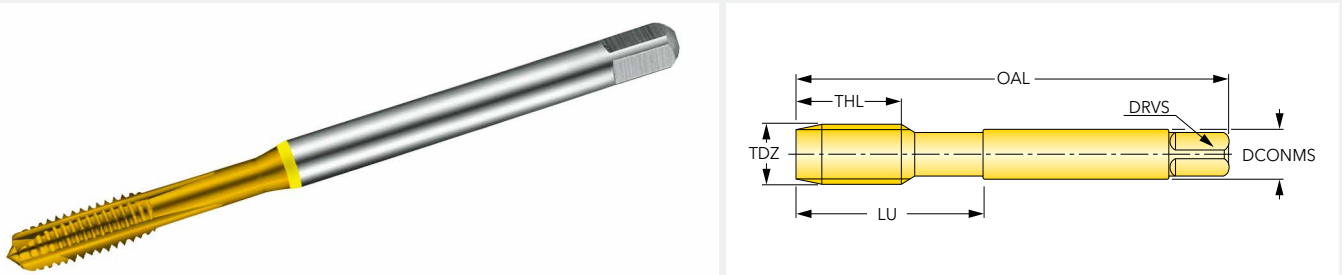




Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard	
											INHENI	INHETC
ITGN M-2X0.4-H	M2	0.400	45.00	8.0	-	2.80	2	2.10	1.60	DIN 371	•	•
ITGN M-2.2X0.45-H	M2.2	0.450	45.00	9.0	-	2.80	2	2.10	1.75	DIN 371	•	•
ITGN M-2.5X0.45-H	M2.5	0.450	50.00	9.0	-	2.80	2	2.10	2.05	DIN 371	•	•
ITGN M-3X0.5-H	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
ITGN M-3.5X0.6-H	M3.5	0.600	56.00	10.0	20.0	4.00	3	3.00	2.90	DIN 371	•	•
ITGN M-4X0.7-H	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
ITGN M-5X0.8-H	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	•	•
ITGN M-6X1.0-H	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	•	•
ITGN M-8X1.25-H	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	•	•
ITGN M-10X1.5-H	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
ITGN M-12X1.75-H	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•	•
ITGN M-14X2.0-H	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•	•
ITGN M-16X2.0-H	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•	•
ITGN M-18X2.5-H	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•	•
ITGN M-20X2.5-H	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

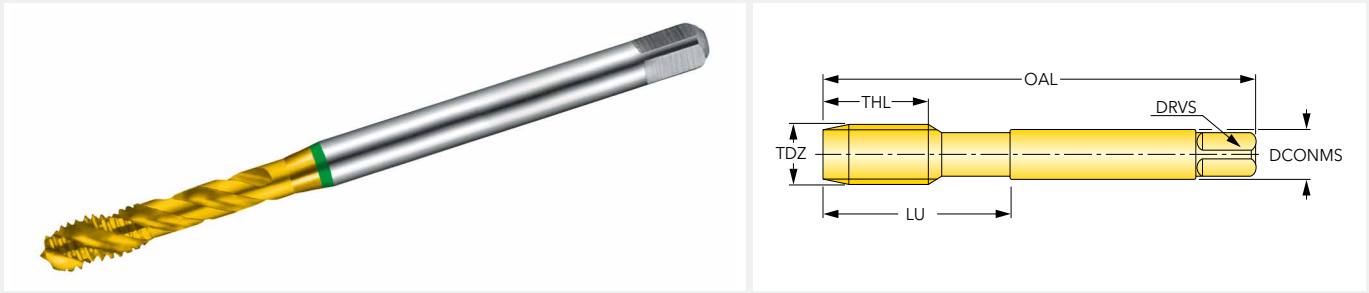
DIN 13 HSS GUN POINT MACHINE TAPS - ISO METRIC COARSE THREADS FOR HARDENED STEEL AND H.T.A.



Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	INPMTC
ITGN M-2X0.4-Y	M2	0.400	45.00	8.0	-	2.80	2	2.10	1.60	DIN 371	•
ITGN M-2.2X0.45-Y	M2.2	0.450	45.00	9.0	-	2.80	2	2.10	1.75	DIN 371	•
ITGN M-2.5X0.45-Y	M2.5	0.450	50.00	9.0	-	2.80	2	2.10	2.05	DIN 371	•
ITGN M-3X0.5-Y	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•
ITGN M-3.5X0.6-Y	M3.5	0.600	56.00	10.0	20.0	4.00	3	3.00	2.90	DIN 371	•
ITGN M-4X0.7-Y	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•
ITGN M-5X0.8-Y	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	•
ITGN M-6X1.0-Y	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	•
ITGN M-8X1.25-Y	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	•
ITGN M-10X1.5-Y	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	•
ITGN M-12X1.75-Y	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•
ITGN M-14X2.0-Y	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•
ITGN M-16X2.0-Y	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•
ITGN M-18X2.5-Y	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•
ITGN M-20X2.5-Y	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

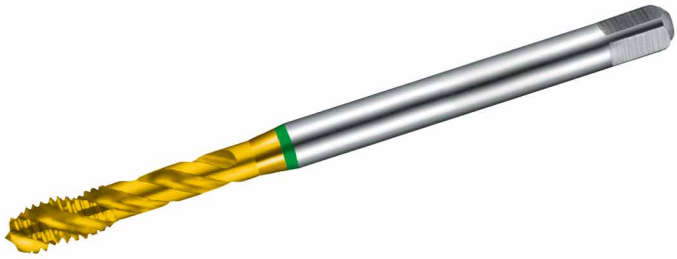
DIN 13 HSSE 5% CO SPIRAL FLUTE MACHINE TAPS ISO METRIC COAR SE THREADS FOR A WIDE RANGE OF MATERIALS.

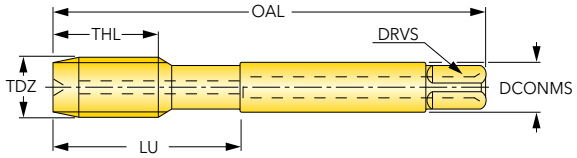


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard	
											INHE	INHETI
ITSN M-2X0.4-M	M2	0.400	45.00	6.0	10.0	2.80	3	2.10	1.60	DIN 371	•	•
ITSN M-2.2X0.45-M	M2.2	0.450	45.00	6.0	10.0	2.80	3	2.10	1.75	DIN 371	•	•
ITSN M-2.5X0.45-M	M2.5	0.450	50.00	6.0	12.0	2.80	3	2.10	2.05	DIN 371	•	•
ITSN M-3X0.5-M	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
ITSN M-3.5X0.6-M	M3.5	0.600	56.00	7.0	20.0	4.00	3	3.00	2.90	DIN 371	•	•
ITSN M-4X0.7-M	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
ITSN M-5X0.8-M	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	•	•
ITSN M-6X1.0-M	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	•	•
ITSN M-8X1.25-M	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	•	•
ITSN M-10X1.5-M	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
ITSN M-12X1.75-M	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	•	•
ITSN M-14X2.0-M	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	•	•
ITSN M-16X2.0-M	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	•	•
ITSN M-18X2.5-M	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	•	•
ITSN M-20X2.5-M	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	•	•
ITSN M-22X2.5-M	M22	2.500	140.00	25.0	-	18.00	4	14.50	19.50	DIN 376	•	•
ITSN M-24X3.0-M	M24	3.000	160.00	30.0	-	18.00	4	14.50	21.00	DIN 376	•	•
ITSN M-27X3.0-M	M27	3.000	160.00	30.0	-	20.00	4	16.00	24.00	DIN 376	•	•
ITSN M-30X3.5-M	M30	3.500	180.00	35.0	-	22.00	4	18.00	26.50	DIN 376	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

DIN 13 HSS SPIRAL FLUTE MACHINE TAPS -
METRIC COARSE THREADS FOR A WIDE RANGE OF MATERIALS.

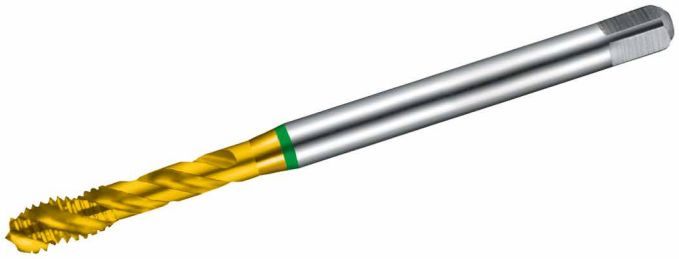


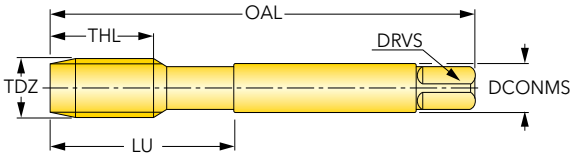


Designation	TDZ	TP(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	CSP(4)	Standard	INHETI
ITSN M-6X1.0-M-B	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	1	•
ITSN M-8X1.25-M-B	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	1	•
ITSN M-10X1.5-M-B	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	1	•
ITSN M-12X1.75-M-B	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	1	•
ITSN M-14X2.0-M-B	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	1	•
ITSN M-16X2.0-M-B	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	1	•

(1) Thread pitch
(2) Number of flutes
(3) Torque key size
(4) 0 - Without coolant supply, 1 - With coolant supply

DIN 13 HSSE. 5% CO SPIRAL FLUTE MACHINE TAPS ISO METRIC COARSE THREADS FOR A WIDE RANGE OF MATERIALS.

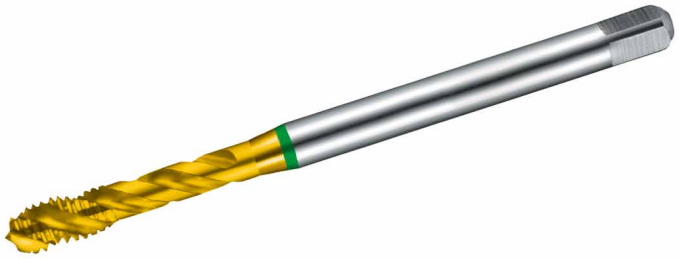


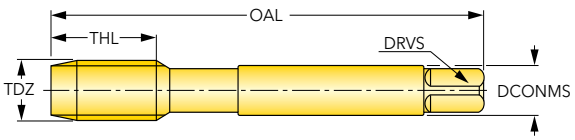


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	INHE
ITSN M-4X0.7-M-F	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	•
ITSN M-5X0.8-M-F	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	•
ITSN M-6X1.0-M-F	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	•
ITSN M-8X1.25-M-F	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	•
ITSN M-10X1.5-M-F	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•
ITSN M-12X1.75-M-F	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	•
ITSN M-14X2.0-M-F	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	•
ITSN M-16X2.0-M-F	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size
[4] 0 - Without coolant supply, 1 - With coolant supply

DIN 13 HSSE 5% CO SPIRAL FLUTE MACHINE TAPS. ISO METRIC FINE THREADS FOR A WIDE RANGE OF MATERIALS.

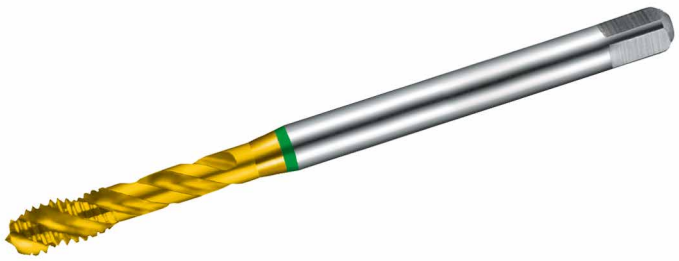


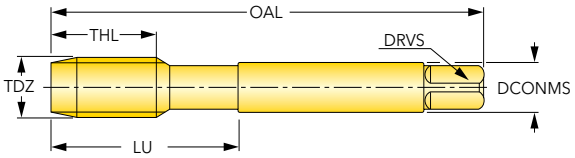


Designation	TDZ	TP[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard	
										INHE	INHETI
ITSN MF-4X0.5-M	MF4	0.500	63.00	10.0	2.80	3	2.10	3.50	DIN 374	•	•
ITSN MF-5X0.5-M	MF5	0.500	70.00	12.0	3.50	3	2.70	4.50	DIN 374	•	•
ITSN MF-6X0.75-M	MF6	0.750	80.00	12.0	4.50	3	3.40	5.20	DIN 374	•	•
ITSN MF-8X1.0-M	MF8	1.000	90.00	15.0	6.00	3	4.90	7.00	DIN 374	•	•
ITSN MF-10X1.0-M	MF10	1.000	90.00	18.0	7.00	3	5.50	9.00	DIN 374	•	•
ITSN MF-10X1.25-M	MF10	1.250	100.00	18.0	7.00	3	5.50	8.80	DIN 374	•	•
ITSN MF-12X1.0-M	MF12	1.000	100.00	18.0	9.00	4	7.00	11.00	DIN 374	•	•
ITSN MF-12X1.25-M	MF12	1.250	100.00	18.0	9.00	4	7.00	10.80	DIN 374	•	•
ITSN MF-12X1.5-M	MF12	1.500	100.00	18.0	9.00	4	7.00	10.50	DIN 374	•	•
ITSN MF-14X1.0-M	MF14	1.000	100.00	18.0	11.00	4	9.00	13.00	DIN 374	•	•
ITSN MF-14X1.25-M	MF14	1.250	100.00	18.0	11.00	4	9.00	12.80	DIN 374	•	•
ITSN MF-14X1.5-M	MF14	1.500	100.00	18.0	11.00	4	9.00	12.50	DIN 374	•	•
ITSN MF-16X1.5-M	MF16	1.500	100.00	18.0	12.00	4	9.00	14.50	DIN 374	•	•
ITSN MF-18X1.5-M	MF18	1.500	110.00	20.0	14.00	4	11.00	16.50	DIN 374	•	•
ITSN MF-20X1.5-M	MF20	1.500	125.00	24.0	16.00	4	12.00	18.50	DIN 374	•	•
ITSN MF-22X1.5-M	MF22	1.500	125.00	24.0	18.00	4	14.50	20.50	DIN 374	•	•
ITSN MF-24X1.5-M	MF24	1.500	140.00	24.0	18.00	4	14.50	22.50	DIN 374	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

HSSE 5% CO SPIRAL FLUTE MACHINE TAPS UNIFIED COARSE THREADS, FOR A WIDE RANGE OF MATERIALS.

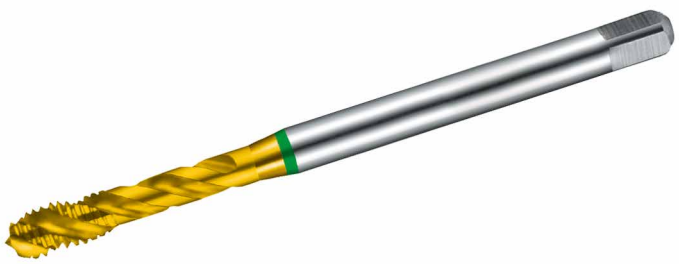


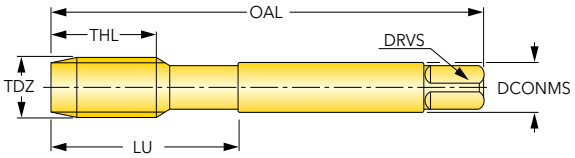


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard INHE	INHETI
ITSN UNC #4-40-M	UNC No.4	40.0	56.00	10.0	18.0	3.50	3	2.70	2.35	DIN 371	•	•
ITSN UNC #5-40-M	UNC No.5	40.0	56.00	10.0	18.0	3.50	3	2.70	2.65	DIN 371	•	•
ITSN UNC #6-32-M	UNC No.6	32.0	56.00	10.0	20.0	4.00	3	3.00	2.85	DIN 371	•	•
ITSN UNC #8-32-M	UNC No.8	32.0	63.00	12.0	21.0	4.50	3	3.40	3.50	DIN 371	•	•
ITSN UNC #10-24-M	UNC No.10	24.0	7.00	14.0	25.0	6.00	3	4.90	3.90	DIN 371	•	•
ITSN UNC #12-24-M	UNC No.12	24.0	80.00	16.0	30.0	6.00	3	4.90	4.50	DIN 371	•	•
ITSN UNC 1/4-20-M	UNC 1/4	20.0	80.00	16.0	30.0	7.00	3	5.50	5.10	DIN 371	•	•
ITSN UNC 5/16-18-M	UNC 5/16	18.0	90.00	18.0	35.0	8.00	3	6.20	6.60	DIN 371	•	•
ITSN UNC 3/8-16-M	UNC 3/8	16.0	100.00	20.0	39.0	10.00	3	8.00	8.00	DIN 371	•	•
ITSN UNC 7/16-14-M	UNC 7/16	14.0	100.00	20.0	-	8.00	3	6.20	9.40	DIN 376	•	•
ITSN UNC 1/2-13-M	UNC 1/2	13.0	110.00	22.0	-	9.00	3	7.00	10.80	DIN 376	•	•
ITSN UNC 9/16-12-M	UNC 9/16	12.0	110.00	24.0	-	11.00	4	9.00	12.20	DIN 376	•	•
ITSN UNC 5/8-11-M	UNC 5/8	11.0	110.00	26.0	-	12.00	4	9.00	13.50	DIN 376	•	•
ITSN UNC 3/4-10-M	UNC 3/4	10.0	125.00	30.0	-	14.00	4	11.00	16.50	DIN 376	•	•
ITSN UNC 7/8-9-M	UNC 7/8	9.0	140.00	30.0	-	18.00	4	14.50	19.50	DIN 376	•	•
ITSN UNC 1"-8-M	UNC 1"	8.0	160.00	35.0	-	18.00	4	14.50	22.25	DIN 376	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

HSSE 5% CO SPIRAL FLUTE MACHINE TAPS UNIFIED FINE THREADS, FOR A WIDE RANGE OF MATERIALS.

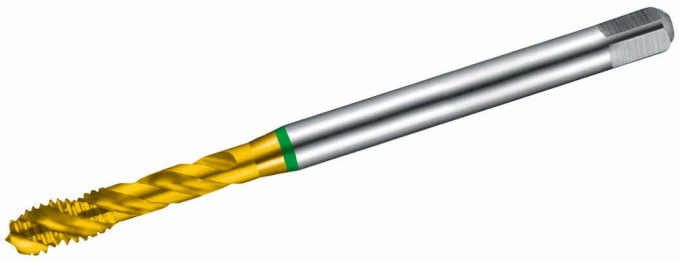


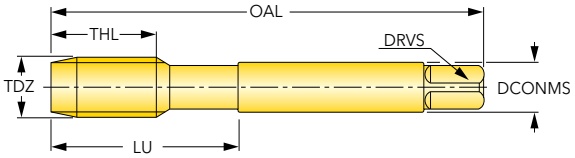


Designation	TDZ	TP(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	Tough ◄► Hard INHE	INHETI
ITSN UNF #4-48-M	UNF No.4	48.0	56.00	8.0	18.0	3.50	3	2.70	2.40	DIN 371	•	•
ITSN UNF #5-44-M	UNF No.5	44.0	56.00	9.0	18.0	3.50	3	2.70	2.70	DIN 371	•	•
ITSN UNF #6-40-M	UNF No.6	40.0	56.00	10.0	20.0	4.00	3	3.00	2.95	DIN 371	•	•
ITSN UNF #8-36-M	UNF No.8	36.0	63.00	12.0	21.0	4.50	3	3.40	3.50	DIN 371	•	•
ITSN UNF #10-32-M	UNF No.10	32.0	70.00	12.0	25.0	6.00	3	4.90	4.10	DIN 371	•	•
ITSN UNF #12-28-M	UNF No.12	28.0	80.00	12.0	30.0	6.00	3	4.90	4.60	DIN 371	•	•
ITSN UNF 1/4-28-M	UNF 1/4	28.0	80.00	12.0	30.0	7.00	3	5.50	5.50	DIN 371	•	•
ITSN UNF 5/16-24-M	UNF 5/16	24.0	90.00	15.0	35.0	8.00	3	6.20	6.90	DIN 371	•	•
ITSN UNF 3/8-24-M	UNF 3/8	24.0	90.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
ITSN UNF 7/16-20-M	UNF 7/16	20.0	100.00	18.0	-	8.00	4	6.20	9.90	DIN 376	•	•
ITSN UNF 1/2-20-M	UNF 1/2	20.0	100.00	18.0	-	9.00	4	7.00	11.50	DIN 376	•	•
ITSN UNF 9/16-18-M	UNF 9/16	18.0	100.00	18.0	-	11.00	4	9.00	12.90	DIN 376	•	•
ITSN UNF 5/8-18-M	UNF 5/8	18.0	100.00	18.0	-	12.00	4	9.00	14.50	DIN 376	•	•
ITSN UNF 3/4-16-M	UNF 3/4	16.0	110.00	24.0	-	14.00	4	11.00	17.50	DIN 376	•	•
ITSN UNF 7/8-14-M	UNF 7/8	14.0	125.00	24.0	-	18.00	4	14.50	20.50	DIN 376	•	•
ITSN UNF 1"-12-M	UNF 1"	12.0	140.00	28.0	-	18.00	4	14.50	23.25	DIN 376	•	•

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

PM RIGHT-HAND 40° SPIRAL FLUTE MACHINE TAPS -
ISO METRIC COARSE THREADS, ACCORDING TO DIN 13, FOR STAINLESS STEEL.

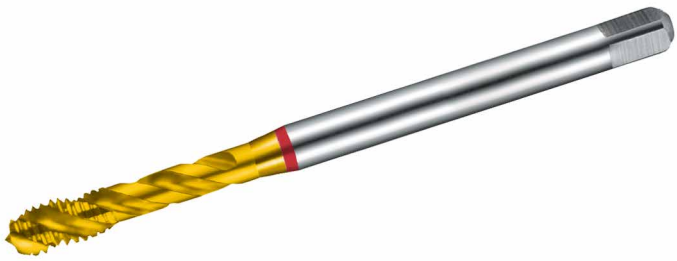


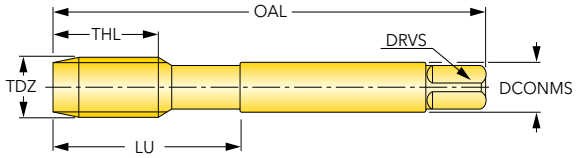


Designation	TDZ	TP(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	Tough ◄► Hard	
											INPMST	INPMTC
ITSN M-2X0.4-S	M2	0.400	45.00	6.0	10.0	2.80	3	2.10	1.60	DIN 371	•	•
ITSN M-2.5X0.45-S	M2.5	0.450	50.00	6.0	12.0	2.80	3	2.10	2.05	DIN 371	•	•
ITSN M-3X0.5-S	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
ITSN M-4X0.7-S	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
ITSN M-5X0.8-S	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	•	•
ITSN M-6X1.0-S	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	•	•
ITSN M-8X1.25-S	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	•	•
ITSN M-10X1.5-S	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
ITSN M-12X1.75-S	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	•	•
ITSN M-14X2.0-S	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	•	•
ITSN M-16X2.0-S	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	•	•
ITSN M-18X2.5-S	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 371	•	•
ITSN M-20X2.5-S	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	•	•

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

DIN 13 HSS RIGHT-HAND 40° SPIRAL FLUTE MACHINE TAPS - ISO METRIC COARSE THREADS FOR H.T.A.

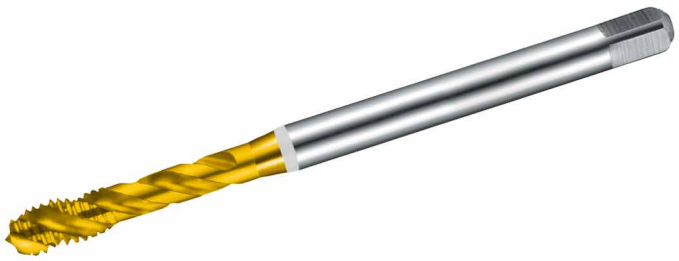


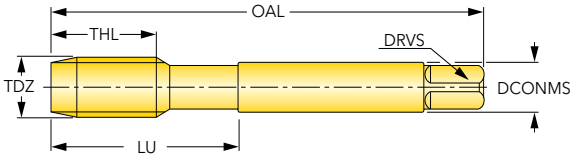


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard	
											INHE	INHETC
ITSN M-2X0.4-H	M2	0.400	45.00	6.0	10.0	2.80	3	2.10	1.60	DIN 371	•	•
ITSN M-2.2X0.45-H	M2.2	0.450	45.00	6.0	10.0	2.80	3	2.10	1.75	DIN 371	•	•
ITSN M-2.5X0.45-H	M2.5	0.450	50.00	6.0	12.0	2.80	3	2.10	2.05	DIN 371	•	•
ITSN M-3X0.5-H	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
ITSN M-3.5X0.6-H	M3.5	0.600	56.00	7.0	20.0	4.00	3	3.00	2.90	DIN 371	•	•
ITSN M-4X0.7-H	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
ITSN M-5X0.8-H	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	•	•
ITSN M-6X1.0-H	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	•	•
ITSN M-8X1.25-H	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	•	•
ITSN M-10X1.5-H	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
ITSN M-12X1.75-H	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	•	•
ITSN M-14X2.0-H	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	•	•
ITSN M-16X2.0-H	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	•	•
ITSN M-18X2.5-H	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	•	•
ITSN M-20X2.5-H	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

HSS STRAIGHT FLUTE MACHINE TAPS -
ISO METRIC COARSE THREADS, ACCORDING TO DIN 13, FOR GREY CAST IRON.

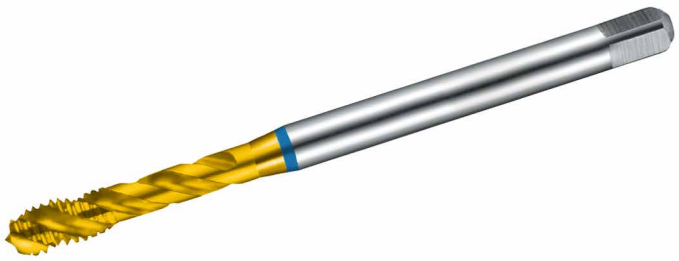


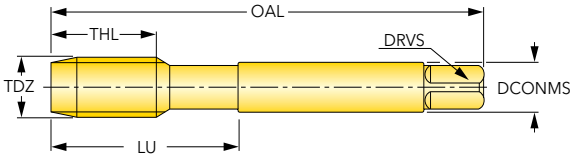


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	INHETA
ITSN M-3X0.5-G	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	•
ITSN M-4X0.7-G	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	•
ITSN M-5X0.8-G	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	•
ITSN M-6X1.0-G	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	•
ITSN M-8X1.25-G	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	•
ITSN M-10X1.5-G	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•
ITSN M-12X1.75-G	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	•
ITSN M-14X2.0-G	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	•
ITSN M-16X2.0-G	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	•
ITSN M-18X2.5-G	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	•
ITSN M-20X2.5-G	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

HSS STRAIGHT FLUTE MACHINE TAPS -
ISO METRIC COARSE THREADS, ACCORDING TO DIN 13, FOR LOW CARBONE STEEL.

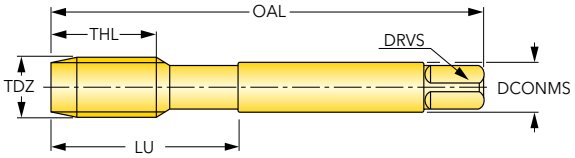




Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	INHEST
ITSN M-4X0.7-N	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	•
ITSN M-5X0.8-N	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	•
ITSN M-6X1.0-N	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	•
ITSN M-7X1.0-N	M7	1.000	80.00	12.0	30.0	7.00	3	5.50	6.00	DIN 371	•
ITSN M-8X1.25-N	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	•
ITSN M-10X1.5-N	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•
ITSN M-11X1.5-N	M11	1.500	100.00	18.0	-	8.00	3	6.20	9.50	DIN 376	•
ITSN M-12X1.75-N	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	•
ITSN M-14X2.0-N	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	•
ITSN M-16X2.0-N	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	•
ITSN M-18X2.5-N	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	•
ITSN M-20X2.5-N	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

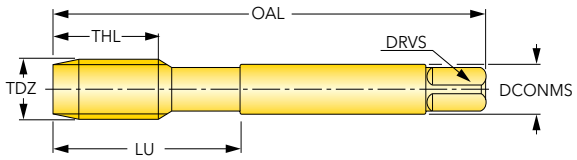
DIN 13 HSS RIGHT-HAND 40° SPIRAL FLUTE MACHINE TAPS FOR ISO METRIC COARSE THREADS ON ALUMINUM AND ALUMINUM ALLOYS.



Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	INHEDL
ITSN M-2X0.4-A	M2	0.400	45.00	6.0	10.0	2.80	3	2.10	1.60	DIN 371	•
ITSN M-3X0.5-A	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	•
ITSN M-4X0.7-A	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	•
ITSN M-5X0.8-A	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	•
ITSN M-6X1.0-A	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	•
ITSN M-8X1.25-A	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	•
ITSN M-10X1.5-A	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•
ITSN M-12X1.75-A	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	•
ITSN M-14X2.0-A	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	•
ITSN M-16X2.0-A	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	•
ITSN M-18X2.5-A	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	•
ITSN M-20X2.5-A	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

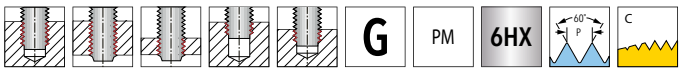
DIN 13 HSS SPIRAL FLUTE MACHINE TAPS -
METRIC COARSE THREADS FOR A WIDE RANGE OF MATERIALS.

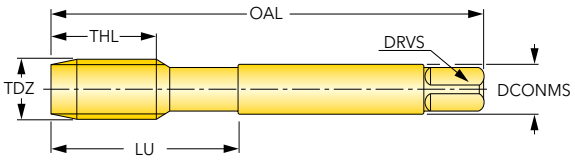


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	INPMTI
ITSN M-2X0.4-Y	M2	0.400	45.00	8.0	-	2.80	3	2.10	1.60	DIN 371	•
ITSN M-2.2X0.45-Y	M2.2	0.450	45.00	9.0	-	2.80	3	2.10	1.75	DIN 376	•
ITSN M-2.5X0.45-Y	M2.5	0.450	50.00	9.0	-	2.80	3	2.10	2.05	DIN 371	•
ITSN M-3 0.5-Y	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•
ITSN M-3.5X0.6-Y	M3.5	0.600	56.00	10.0	20.0	4.00	3	3.00	2.90	DIN 371	•
ITSN M-4X0.7-Y	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•
ITSN M-5X0.8-Y	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	•
ITSN M-6X1.0-Y	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	•
ITSN M-8X1.25-Y	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	•
ITSN M-10X1.5-Y	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	•
ITSN M-12X1.75-Y	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•
ITSN M-14X2.0-Y	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•
ITSN M-16X2.0-Y	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•
ITSN M-18X2.5-Y	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•
ITSN M-20X2.5-Y	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

PM STRAIGHT FLUTE MACHINE TAPS - ISO METRIC COARSE THREADS, ACCORDING TO DIN 13, FOR GRAY CAST IRON.

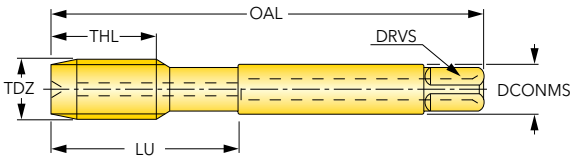




Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ◄► Hard	
											INPMNI	INPMTA
ITSTN M-2X0.4-G	M2	0.400	45.00	8.0	-	2.80	3	2.10	1.60	DIN 371	•	•
ITSTN M-3X0.5-G	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
ITSTN M-4X0.7-G	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
ITSTN M-5X0.8-G	M5	0.800	70.00	14.0	25.0	6.00	4	4.90	4.20	DIN 371	•	•
ITSTN M-6X1.0-G	M6	1.000	80.00	16.0	30.0	6.00	4	4.90	5.00	DIN 371	•	•
ITSTN M-8X1.25-G	M8	1.250	90.00	18.0	35.0	8.00	4	6.20	6.80	DIN 371	•	•
ITSTN M-10X1.5-G	M10	1.500	100.00	20.0	39.0	10.00	4	8.00	8.50	DIN 371	•	•
ITSTN M-12X1.75-G	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•	•
ITSTN M-14X2.0-G	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•	•
ITSTN M-16X2.0-G	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•	•
ITSTN M-18X2.5-G	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•	•
ITSTN M-20X2.5-G	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	•	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

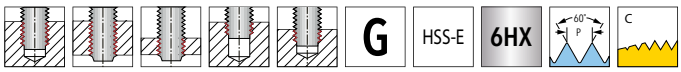
DIN 13 HSS STRAIGHT FLUTE MACHINE TAPS - ISO METRIC COARSE THREADS FOR GREY CAST IRON.

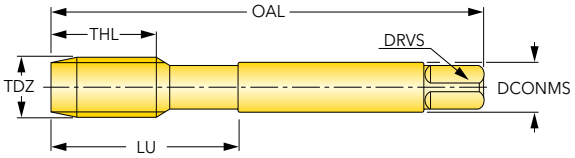


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	CSP[4]	Standard	INPMTA
ITSTN M-6X1.0-G-B	M6	1.000	80.00	16.0	30.0	6.00	4	4.90	5.00	1	DIN 371	•
ITSTN M-8X1.25-G-B	M8	1.250	90.00	18.0	35.0	8.00	4	6.20	6.80	1	DIN 371	•
ITSTN M-10X1.5-G-B	M10	1.500	100.00	20.0	39.0	10.00	4	8.00	8.50	1	DIN 371	•
ITSTN M-12X1.75-G-B	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	1	DIN 376	•
ITSTN M-14X2.0-G-B	M14	2.000	110.00	26.0	-	12.00	4	9.00	14.11	1	DIN 376	•
ITSTN M-16X2.0-G-B	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	1	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

PM STRAIGHT FLUTE MACHINE TAPS - ISO METRIC COARSE THREADS, ACCORDING TO DIN 13, FOR GRAY CAST IRON.

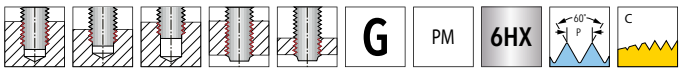


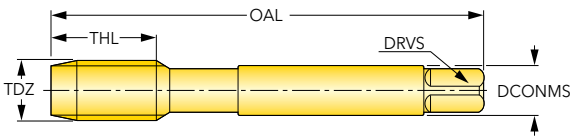


Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	INPMTA
ITSTN M-4X0.7-G-F	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•
ITSTN M-5X0.8-G-F	M5	0.800	70.00	14.0	25.0	6.00	4	4.90	4.20	DIN 371	•
ITSTN M-6X1.0-G-F	M6	1.000	80.00	16.0	30.0	6.00	4	4.90	5.00	DIN 371	•
ITSTN M-8X1.25-G-F	M8	1.250	90.00	18.0	35.0	8.00	4	6.20	6.80	DIN 371	•
ITSTN M-10X1.5-G-F	M10	1.500	100.00	20.0	39.0	10.00	4	8.00	8.50	DIN 371	•
ITSTN M-12X1.75-G-F	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•
ITSTN M-14X2.0-G-F	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•
ITSTN M-16X2.0-G-F	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•

[1] Thread pitch
[2] Number of flutes
[3] Torque key size

PM STRAIGHT FLUTE MACHINE TAPS - ISO METRIC FINE THREADS, ACCORDING TO DIN 13, FOR FOR GRAY CAST IRON.

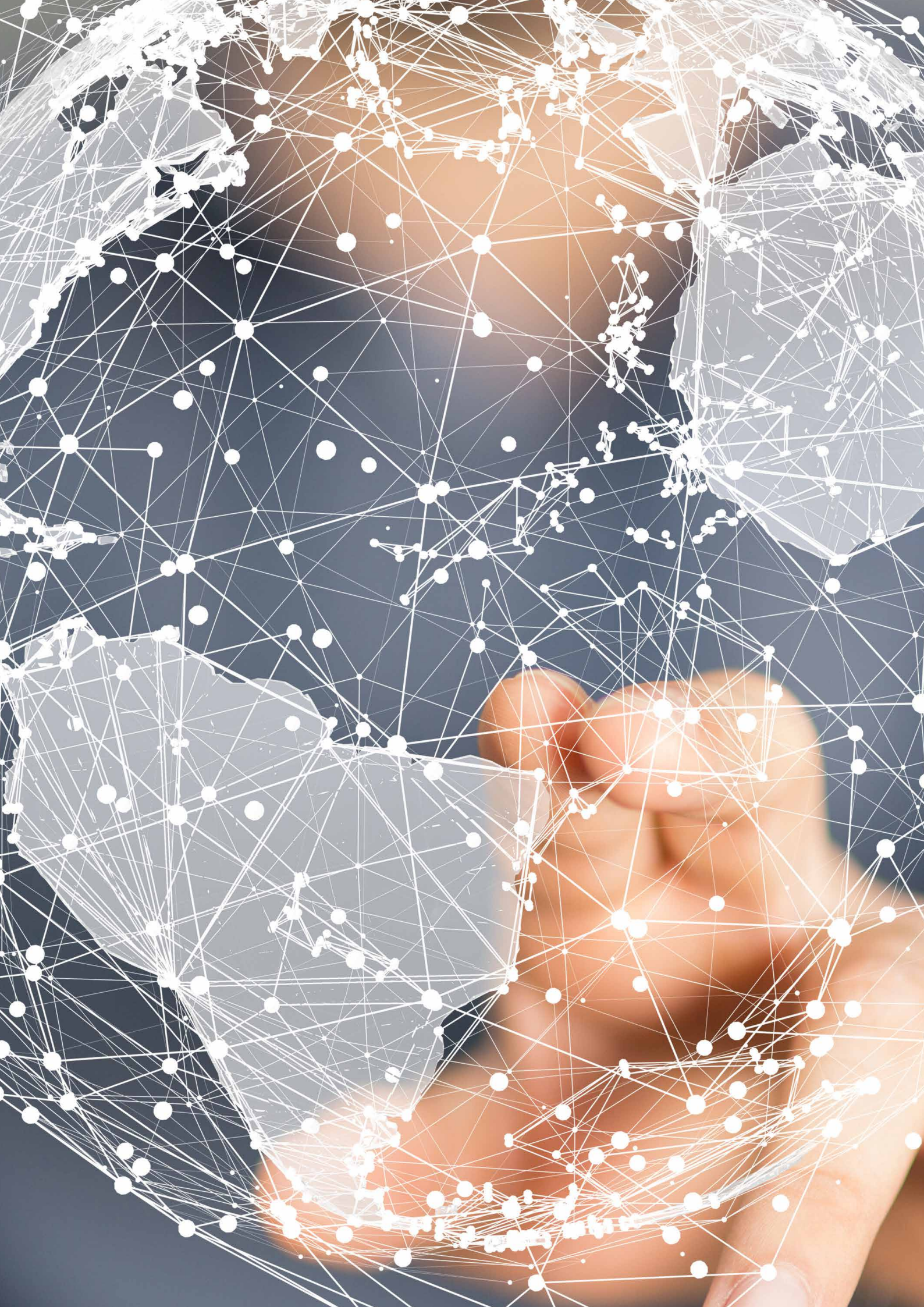




Designation	TDZ	TP(1)	OAL	THL	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	INPMTA
ITSTN MF-8X1.0-G	MF8	1.000	90.00	15.0	6.00	4	4.90	7.00	DIN 374	•
ITSTN MF-10X1.0-G	MF10	1.000	90.00	18.0	7.00	4	5.50	9.00	DIN 374	•
ITSTN MF-10X1.25-G	MF10	1.250	100.00	18.0	7.00	4	5.50	8.80	DIN 374	•
ITSTN MF-12X1.0-G	MF12	1.000	100.00	18.0	9.00	4	7.00	11.00	DIN 374	•
ITSTN MF-12X1.25-G	MF12	1.250	100.00	18.0	9.00	4	7.00	10.80	DIN 374	•
ITSTN MF-12X1.5-G	MF12	1.500	100.00	18.0	9.00	4	7.00	10.50	DIN 374	•
ITSTN MF-14X1.0-G	MF14	1.000	100.00	18.0	11.00	4	9.00	13.00	DIN 374	•
ITSTN MF-14X1.25-G	MF14	1.250	100.00	18.0	11.00	4	9.00	12.80	DIN 374	•
ITSTN MF-14X1.5-G	MF14	1.500	100.00	18.0	11.00	4	9.00	12.50	DIN 374	•
ITSTN MF-16X1.5-G	MF16	1.500	100.00	18.0	12.00	4	9.00	14.50	DIN 374	•

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

NOTES



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