

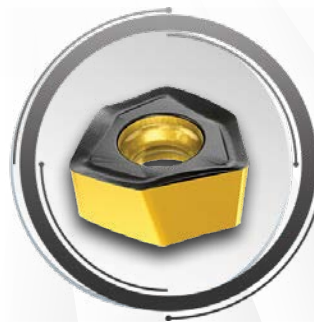
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INTELLIGENTLY?

MACHINING

FAST FEED MILLING

Quick Tool Selector Guide
Metric



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ISCAR Features **New Age** Milling Tool Assemblies Online



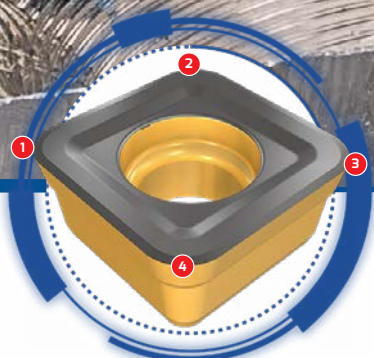
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SCAN ME





MILL4FEED



Single-Sided Square Inserts
with 4 Cutting Edges
for Fast Feed Milling



Endmills with FLEX-FIT
Threaded Adaptation

Fast Feed Milling Cutters

Fast feed (FF) milling cutters are a key factor in fast feed milling techniques. The cutter geometry, designed for efficient chip thinning, needs to ensure correct distribution of the cutting force components. There are two principal geometrical approaches. The first design requires the cutting edge of an FF milling cutter to be an arc of a great circle.

Another concept is based on using one or two straight edges that are chords of the arc. In both cases, the small cutting edge angle (usually 9-17°) meets the requirements of chip thinning and total cutting force. Ensuring the geometry of solid carbide fast feed endmills and replaceable milling heads demands the specific shape of a cutting edge, while in indexable milling it may be provided by the appropriate location of an insert of even a simple profile. FF milling is also referred as high feed milling (HFM)



Although the introduction of innovative carbide grades and advances in the form of rake faces has further improved progress in FF milling cutters, the essential element of fast feed milling – geometry – remains constant.

The cutting edge of a FF milling cutter is the arc of a great circle (or the chords that approximate the arc), and therefore the cutting edge angle of the cutter is not a constant value but varies depending on the axial depth of cut from 0 to 90°. Decreasing depth reduces the cutting edge angle resulting in thinner chips. The programmed feed per tooth for a cutter with round inserts relates to the maximal diameter of the cutter, i.e. to the maximal depth of cut (it is equal to the insert radius) and the maximal cutting edge angle.

If the cutter mills at less than the maximum depth, the chip is thinner; therefore, the programmed feed should be increased accordingly to produce chips of the required thickness. The same situation is observed with ball-nose milling tools, which explains why FF cutters run so fast.

FF milling requires machine tools moderate feed (MF) cutters facilitate productive roughing at these machines. Compared with fast feed mills, MF cutters feature a higher cutting edge angle (typically 30°) as they move slower but machine at higher depths and need more power. In MF milling, the feed per tooth is moderate compared to FF milling yet faster than standard traditional milling.

MF cutters may be considered as a kind of FF mills.

ISCAR offers a wide variety of fast feed milling families that represent different classes of indexable tools, solid carbide endmills and solid carbide interchangeable heads with **MULTI-MASTER** threaded connections. This guide is intended as a quick selection for the right tool suitable for the type of material and type of application.



NEOFEE



LOGIQ4FEED
HIGH FEED MILLING



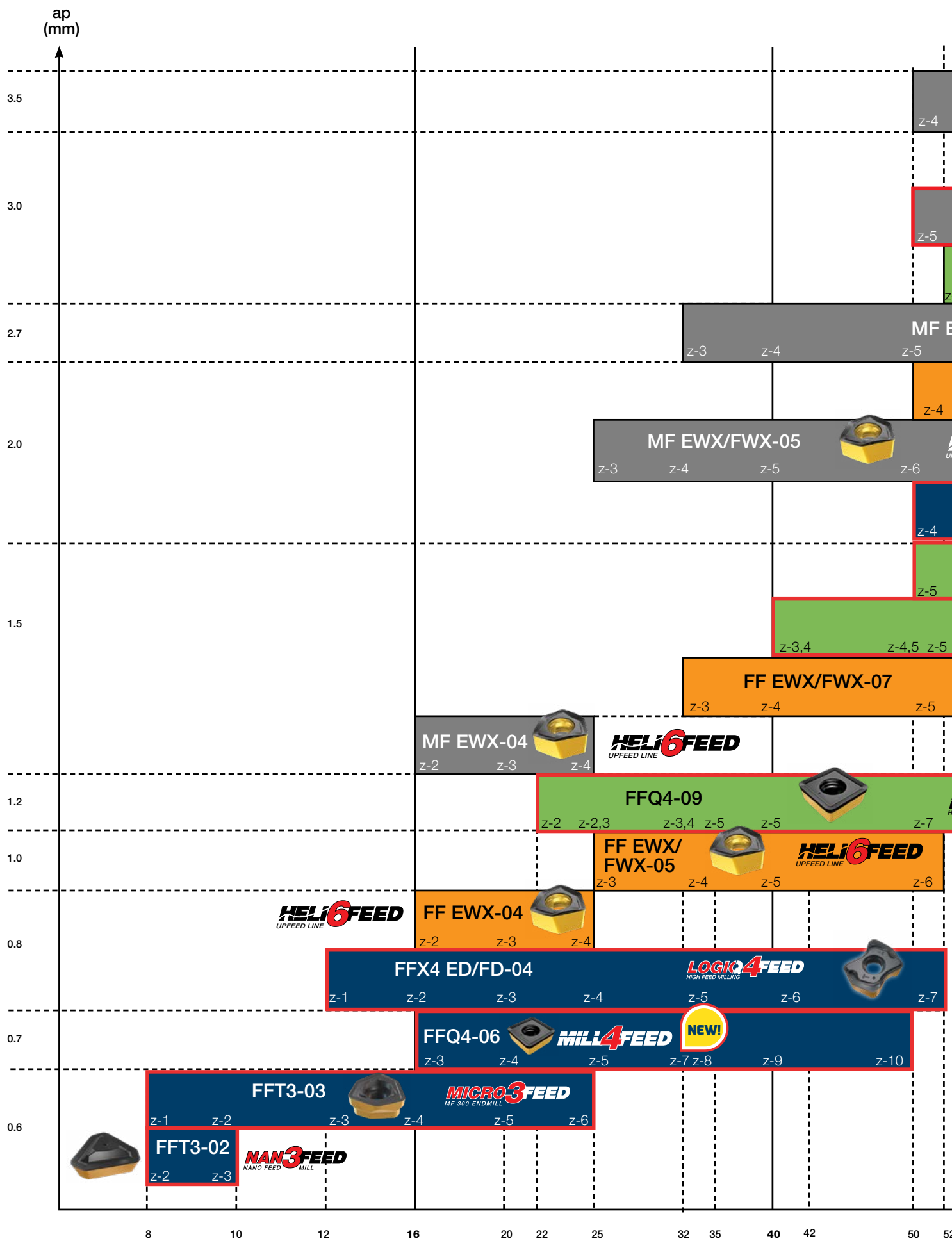
MILL4FEED
HIGH FEED

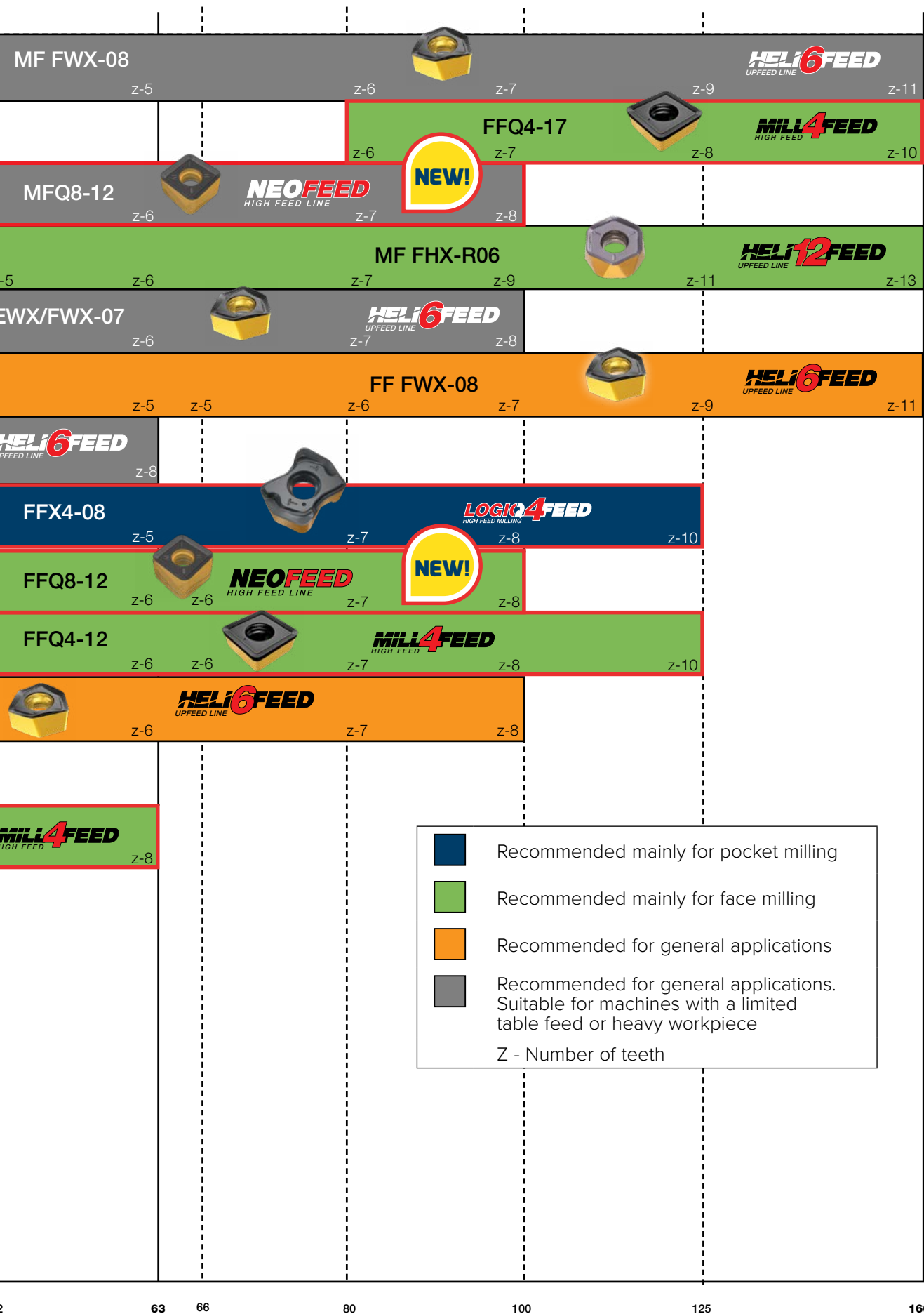


MICRO3FEED
MF 300 ENDMILL



ISCAR Fast Feed (High Feed) Indexable Milling Chart





Indexable Fast Feed Family Selector

Range of Diameters (mm)	Family	Description	APMX (mm)	Available Diameters (mm) for Configuration		Insert			
				Endmill	MM	Description	Chip Former	No. of Sideds	No. Edges
Ø8-16	NAN-3-FEED	FFT3 EFM-02	0.6	8-10	8-10	FFT3 TXMT 020105	T	1	3
	MICRO-3-FEED	FFT3 EFM-03	0.6	8-16	10-16	FFT3 WXMT 030206	T	1	3
	LOGIQ-4-FEED	FFX4 ED-04	0.8	12-16	16	FFX4 XNMU 040310	T, HP, RM-T, RM-HP	2	4
	LOGIQ-4-FEED	FFX4 ED/FD-04	0.6	12-16	16	FFX4 XNMW 040310	XNMW	2	4
	HELI-DO	FF EWX-04	0.8	16	16	H600 WXCW 040310	T, HP	2	6
	HELI-DO	MF EWX-04	1.5	16	16	H600 WXCW 040310	T, HP	2	6
	MILL-4-FEED	FFQ4-06	0.7	16	16	FFQ4 SOMT 060210	T, HP, RM-HP, HP-P	1	4
	MILL-4-FEED	FFQ4-06	0.6	16	16	FFQ4 SOMW 060213	SOMW	1	4

Range of Diameters (mm)	Family	Description	APMX (mm)	Available Diameters (mm) for Configuration				Insert			
				Endmill	MM	FLEX-FIT	Facemill	Description	Chip Former	No. of Sideds	No. Edges
Ø20-42	MICRO-3-FEED	FFT3 EFM-03	0.6	20-25	20-25			FFT3 WXMT 030206	T	1	3
	LOGIQ-4-FEED	FFX4 ED/FD-04	0.8	20-32	20-40	20-42	32-42	FFX4 XNMU 040310	T, RM-T, HP, RM-HP	2	4
	LOGIQ-4-FEED	FFX4 ED/FD-04	0.6	20-32	20-40	20-42	32-42	FFX4 XNMW 040310	XNMW	2	4
	HELI-DO	FF EWX-04	0.8	20	20-25	20-25		H600 WXCW 040310	T, HP	2	6
	HELI-DO	FF EWX/FWX-05	1.0	20-40	25	25-40	40	H600 WXCW 05T312	T, HP	2	6
	MILL-4-FEED	FFQ4-09	1.2	22-35		22-40	40	FFQ4 SOMT 0904	T, RM-T, HP, RM-HP, HP-P, TFW	1	4
	MILL-4-FEED	FFQ4-09	1	22-35		22-40	40	FFQ4 SOMW 0904	SOMW	1	4
	HELI-DO	MF EWX-04	1.5	20		20-25		H600 WXCW 040310	T, HP	2	6
	HELI-DO	FF EWX/FWX-07	1.5	32-40		32-40	40	H600 WXCW 070515	T, HP	2	6
	MILL-4-FEED	FFQ4-12	1.5				40	FFQ4 SOMT 1205	T, T20, RM-T, HP, RM-HP, HP-P, TFW	1	4
	MILL-4-FEED	FFQ4-12	1.2				40	FFQ4 SOMW 1205	SOMW	1	4
	HELI-DO	MF EWX/FWX-05	2.0	25-32		25-32	40	H600 WXCW 05T312	T, HP	2	6
	HELI-DO	MF EWX/FWX-07	2.7	32-40		32	40	H600 WXCW 070515	T, HP	2	6
	MILL-4-FEED	FFQ4-06	0.7	20-32	20-32	20-40	40	FFQ4 SOMT 060210	T, HP, RM-HP, HP-P	1	4
	MILL-4-FEED	FFQ4-06	0.6	20-32	20-32	20-40	40	FFQ4 SOMW 060213	SOMW	1	4

Range of Diameters (mm)	Family	Description	APMX (mm)	Available Diameters (mm) for Configuration		Insert			
				Facemill		Description	Chip Former	No. of Sideds	No. Edges
Ø50-63	MILL-4-FEED	FFQ4-06	0.7	50		FFQ4 SOMT 060210	T, HP, RM-HP, HP-P	1	4
	MILL-4-FEED	FFQ4-06	0.6	50		FFQ4 SOMW 060213	SOMW	1	4
	LOGIQ-4-FEED	FFX4 ED/FD-04	0.8	50-52		FFX4 XNMU 040310	T, RM-T, HP, RM-HP	2	4
	LOGIQ-4-FEED	FFX4 ED/FD-04	0.6	50-52		FFX4 XNMW 040310	XNMW	2	4
	HELI-DO	FF FWX-05	1.0	50-52		H600 WXCW 05T312	T, HP	2	6
	MILL-4-FEED	FFQ4-09	1.2	50-63		FFQ4 SOMT 0904	T, RM-T, HP, RM-HP, HP-P, TFW	1	4
	MILL-4-FEED	FFQ4-09	1.0	50-63		FFQ4 SOMW 0904	SOMW	1	4
	HELI-DO	FF FWX-07	1.5	50-63		H600 WXCW 070515	T, HP	2	6
	MILL-4-FEED	FFQ4-12	1.5	50-63		FFQ4 SOMT 1205	T, T20, RM-T, HP, RM-HP, HP-P, TFW	1	4
	MILL-4-FEED	FFQ4-12	1.2	50-63		FFQ4 SOMW 1205	SOMW	1	4
	NEO-FEED	FFQ8 FD	1.5	50-63		FFQ8 SZMU 120520	T, HP	2	8
	LOGIQ-4-FEED	FFX4 FD-08	2.0	50-63		FFX4 XNMU 080620	T, HP	2	4
	HELI-DO	MF FWX-05	2.0	50-63		H600 WXCW 05T312	T, HP	2	6
	HELI-DO	FF FWX-08	2.0	50-63		H600 WXCW 0806	T, HP, RM	2	6
	HELI-DO	MF FWX-07	2.7	50-63		H600 WXCW 070515	T, HP	2	6
	NEO-FEED	MFQ8 FD	3.0	50-63		FFQ8 SZMU 120520	T, HP	2	8
	HELI-12-FEED	MF FHX-R06	3.0	52-63		H1200 HXCW 0606	TR, HPR	2	12
	HELI-DO	MF FWX-08	3.5	50-63		H600 WXCW 0806	T, HP, RM	2	6

Range of f_z (mm/t)	Radius for Programming	Applications							Material Groups					
									P	M	K	N	S	H
0.20-0.70	1.0			●	●			●	●					
0.20-0.80	1.0	●	●	●	●			●	●		●		●	
0.20-1.20	1.7	●	●	●	●	●		●	●	●			●	●
0.20-1.00	1.7	●		●	●	●		●	●	●			●	●
0.20-1.00	1.8	●	●	●	●	●		●	●	●			●	●
0.20-0.60	2.4	●	●	●	●	●		●	●	●			●	●
0.20-1.00	1.7	●		●	●	●		●	●	●	●	●	●	●
0.20-1.00	1.9	●		●	●	●		●	●	●			●	●

Range of f_z (mm/t)	Radius for Programming	Applications							Material Groups					
									P	M	K	N	S	H
0.20-0.80	1.0	●	●	●	●			●	●		●		●	
0.20-1.20	1.7	●	●	●	●	●		●	●	●			●	●
0.20-1.00	1.7	●		●	●	●		●	●	●			●	●
0.20-1.00	1.8	●	●	●	●	●		●	●	●			●	●
0.30-1.00	2.3	●	●	●	●	●		●	●	●			●	●
0.40-1.50	2.4	●		●	●	●		●	●	●	●	●	●	●
0.20-1.00	3.0	●			●	●		●	●	●			●	●
0.20-0.60	2.4	●	●	●	●	●		●	●	●			●	●
0.40-1.40	3.0	●	●	●	●	●		●	●	●			●	●
0.40-2.00	3.0	●		●	●	●		●	●	●	●	●	●	●
0.40-1.00	4.0	●		●	●	●		●	●	●			●	●
0.20-0.60	3.1	●	●	●	●	●		●	●	●			●	●
0.20-1.00	4.0	●	●	●	●	●		●	●	●			●	●
0.20-1.00	1.7	●		●	●	●		●	●	●	●	●	●	●
0.20-1.00	1.9	●		●	●	●		●	●	●			●	●

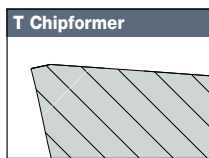
Range of f_z (mm/t)	Radius for Programming	Applications							Material Groups					
									P	M	K	N	S	H
0.20-1.00	1.7	●		●	●	●		●	●	●	●	●	●	●
0.20-1.00	1.9	●		●	●	●		●	●	●			●	●
0.20-1.20	1.7	●	●	●	●	●		●	●	●			●	●
0.20-1.00	1.7	●		●	●	●		●	●	●			●	●
0.30-1.00	2.3	●	●	●	●	●		●	●	●			●	●
0.40-1.50	2.4	●		●	●	●		●	●	●	●	●	●	●
0.40-1.00	3.0	●		●	●	●		●	●	●			●	●
0.40-1.40	3.0	●	●	●	●	●		●	●	●			●	●
0.40-2.00	3.0	●		●	●	●		●	●	●	●	●	●	●
0.40-1.00	4.0	●		●	●	●		●	●	●			●	●
0.20-1.50	3.6	●		●	●	●		●	●	●			●	●
0.20-1.20	3.9	●	●	●	●	●		●	●	●			●	●
0.20-0.60	3.1	●	●	●	●	●		●	●	●			●	●
0.40-1.40	3.3 & 3.6 for RM	●	●	●	●	●		●	●	●			●	●
0.20-0.80	4.1	●	●		●	●		●	●	●			●	●
0.20-1.00	5.0	●	●		●	●		●	●	●			●	●
0.10-0.65	5.54	●						●	●	●			●	●
0.20-0.80	4.6 & 4.8 for RM	●	●		●	●		●	●	●			●	●

● - Most suitable ○ - Suitable

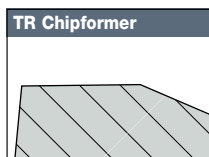
Indexable Fast Feed Family Selector

Range of Diameters (mm)	Family	Description	APMX (mm)	Available Diameters (mm) for Configuration	Insert			
				Facemill	Description	Chip Former	No. of Sides	No. Edges
Ø66-160	NEO-FEED	FFQ8 FD	1.5	80-100	FFQ8 SZMU 120520	T, HP	2	8
	LOGIQ-4-FEED	FFX4 FD-08	2.0	80-125	FFX4 XNMU 080620	T, HP	2	4
	HELI-DO	FF FWX-07	1.5	80-100	H600 WXCW 070515	T, HP	2	6
	MILL-4-FEED	FFQ4-12	1.5	66-125	FFQ4 SOMT 1205	T, T20, RM-T, HP, RM-HP, HP-P, TFW	1	4
	MILL-4-FEED	FFQ4-12	1.2	66-125	FFQ4 SOMW 1205	SOMW	1	4
	HELI-DO	FF FWX-08	2.0	66-160	H600 WXCW 0806	T, HP, RM	2	6
	HELI-DO	MF FWX-07	2.7	80-100	H600 WXCW 070515	T, HP	2	6
	NEO-FEED	MFQ8 FD	3.0	80-100	FFQ8 SZMU 120520	T, HP	2	8
	MILL-4-FEED	FFQ4-17	3.0	80-160	FFQ4 SOMT 1706	T, RM-T, HP, RM-HP, TFW	1	4
	MILL-4-FEED	FFQ4-17	2.5	80-160	FFQ4 SOMW 1706	SOMW	1	4
	HELI-12-FEED	MF FHX-R06	3.0	80-160	H1200 HXCW 0606	TR, HPR	2	12
	HELI-DO	MF FWX-08	3.5	80-160	H600 WXCW 0806	T, HP, RM	2	6

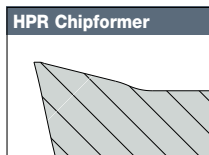
Insert Chipformer Types



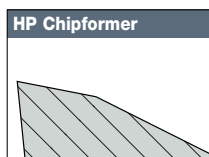
T - For steel, ferritic and martensitic stainless steel and cast iron



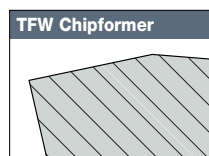
TR - For steel, ferritic and martensitic stainless steel and cast iron



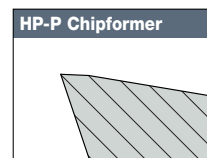
HPR - For austenitic stainless steel and high temperature alloys



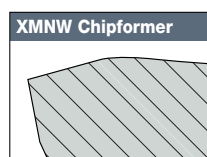
HP - For austenitic stainless steel and high temperature alloys



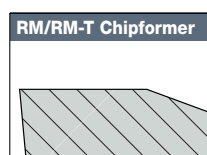
TFW - for unstable cutting conditions



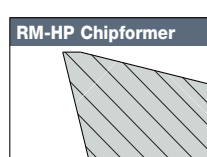
HP-P - For aluminium materials



XMNW - For hard material (up to 49 HRC) and uneven surfaces



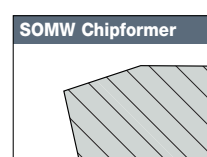
RM / RM-T - For interrupted cut and for machining near straight wall shoulders of steel, ferritic and martensitic stainless steel, cast iron and hardened steel



RM-HP - For interrupted cut and for machining near straight wall shoulders of austenitic stainless steel and high temperature alloys



T20 - For gray and nodular cast iron



SOMW - Flat insert for hard material (up to 60 HRC) and uneven surface

Range of f_z (mm/t)	Radius for Programming	Applications								Material Groups					
										P	M	K	N	S	H
0.20-1.50	3.6	●		●	●	●	●	●	●	●	●	●		●	●
0.20-1.20	3.9	●	●	●	●	●	●	●	●	●	●	●		●	●
0.40-1.40	3.0	●	●	●	●	●	●	●	●	●	●	●		●	●
0.40-2.00	3.0	●		●	●	●	●	●	●	●	●	●	●	●	●
0.40-1.00	4.0	●		●	●	●	●	●	●	●	●	●		●	●
0.40-1.50	3.3 & 3.6 for RM	●	●	●	●	●	●	●	●	●	●	●		●	●
0.20-0.80	4.0	●		●	●		●	●	●	●	●	●		●	●
0.20-1.00	5.0	●		●			●	●	●	●	●	●		●	●
0.40-2.00	5.5	●	●	●	●	●	●	●	●	●	●	●		●	●
0.40-1.00	6.3	●	●	●	●	●	●	●	●	●	●	●		●	●
0.10-0.65	5.54	●								●	●	●		●	●
0.20-0.80	4.6 & 4.8 for RM	●		●	●		●	●	●	●	●	●		●	●

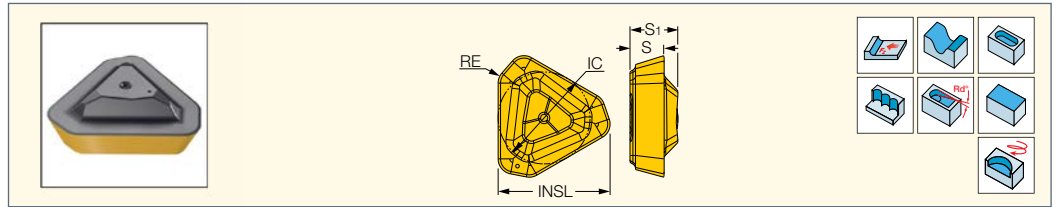
● - Most suitable ● - Suitable



Single Sided Polished Insert for
Materials ISO N with 4 Cutting Edges

FFT3 TXMT 02

Triangular Miniature Inserts
for Fast Feed Milling at
Small Depths of Cut



Designation	Dimensions					Tough ↔ Hard		Recommended Machining Data	
	INSL	IC	RE	S	S1	IC830	IC808	a_p (mm)	f_z (mm/t)
FFT3 TXMT 020105T	3.66	2.00	0.50	1.10	1.56	●	●	0.20-0.60	0.20-0.70

- For side plunging, the initial cutting feed is 0.06 mm/t

Recommended Machining Conditions for FFT3-02 Fast Feed Endmills

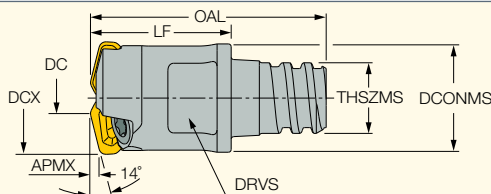
Workpiece material						D.O.C. a _p (mm)	Cutting speed v _c (m/min)	Feed f _z (mm/tooth)	Coolant
ISO class DIN/ISO	Description	ISCAR mat. group*	Hardness, HB	Typical representative					
				AISI/SAE/ASTM	DIN W.-Nr.				
P	non-alloy steel	1-5	130-180	1020	1.0402	0.20-0.60	120-200	0.20-0.70	dry/wet
	low alloy steel	6-8	260-300	4340	1.6582		100-180	0.20-0.70	dry/wet
		9	HRC 35-42**	3135	1.5710		100-130	0.20-0.60	dry/wet
	high alloy steel	10-11	200-220	H13	1.2344		80-150	0.20-0.60	dry/wet
	ferritic/martensitic stainless steel	12-13	200	420	1.4021		80-150	0.20-0.60	dry/wet

* ISCAR material group Based on VDI 3323 standard ** Quenched and tempered

For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

FFT3 EFM-MM 02

Small Diameter Endmills with a MULTI-MASTER Threaded Adaptation that Mount Triangular Inserts for Fast Feed Milling



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	LF	DCONMS	THSZMS	OAL	DRVS ⁽⁴⁾	RMPX ⁽⁵⁾	MDN ⁽⁶⁾	MDX ⁽⁷⁾	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	kg
FFT3 EFMD08/.31-2MMT05-02	8.00	2.20	0.60	2.9	2	10.00	7.60	T05	16.75	5.5	10.8	10.20	15.00	FFT3 TXMT 0201205T	0.5	0.01
FFT3 EFMD10/.39-3MMT06-02	10.00	4.20	0.60	2.9	3	10.00	9.70	T06	16.30	8.0	4.7	14.20	19.00	FFT3 TXMT 0201205T	0.5	0.01

• Radius for programing 1.0 mm • To generate a straight surface without cusps, the width of cut must not exceed DC

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Maximum plunging width

⁽³⁾ Number of inserts (or edges for solid tool)

⁽⁴⁾ Torque key size

⁽⁵⁾ Maximum ramping angle

⁽⁶⁾ Machinable diameter minimum for interpolation

⁽⁷⁾ Machinable diameter maximum for interpolation

⁽⁸⁾ Master insert identification

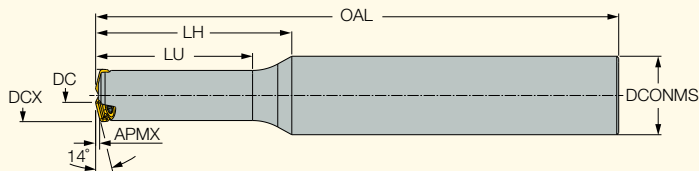
⁽⁹⁾ Recommended tightening torque (Nm) for insert screw

Spare Parts

Designation		
FFT3 EFM-MM 02	SR M2X0.4-2.9 T6-HG	T-6/5 MAGNET 3X3

FFT3 EFM-02

Small Diameter Endmills
Carrying Single-Sided Triangular Inserts for Fast Feed Milling



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	LU	LH	OAL	DCONMS	Shank ⁽⁴⁾	RMPX ⁽⁵⁾	MDN ⁽⁶⁾	MDX ⁽⁷⁾	CSP ⁽⁸⁾	MIID ⁽⁹⁾	TQ (Nm) ⁽¹⁰⁾	kg
FFT3 EFM D08-2-060-C10-02	8.00	2.20	0.60	2.9	2	17.00	20.0	60.00	10.00	C	10.8	10.20	15.00	1	FFT3 TXMT 0201205T	0.5	0.03
FFT3 EFM D08-2-080-C12-02	8.00	2.20	0.60	2.9	2	26.00	30.0	80.00	12.00	C	10.8	10.20	15.00	1	FFT3 TXMT 0201205T	0.5	0.05
FFT3 EFM D10-3-070-C10-02	10.00	4.20	0.60	2.9	3	19.50	20.0	70.00	10.00	C	4.7	14.20	19.00	1	FFT3 TXMT 0201205T	0.5	0.04
FFT3 EFM D10-3-090-C12-02	10.00	4.20	0.60	2.9	3	30.00	33.0	90.00	12.00	C	4.7	14.20	19.00	1	FFT3 TXMT 0201205T	0.5	0.06

• Radius for programming 1.0 mm • To generate a straight surface without cusps, the width of cut must not exceed DC

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Maximum plunging width

⁽³⁾ Number of inserts (or edges for solid tool)

⁽⁴⁾ C-Cylindrical

⁽⁵⁾ Maximum ramping angle

⁽⁶⁾ Machinable diameter minimum for interpolation

⁽⁷⁾ Machinable diameter maximum for interpolation

⁽⁸⁾ 0 - Without coolant supply, 1 - With coolant supply

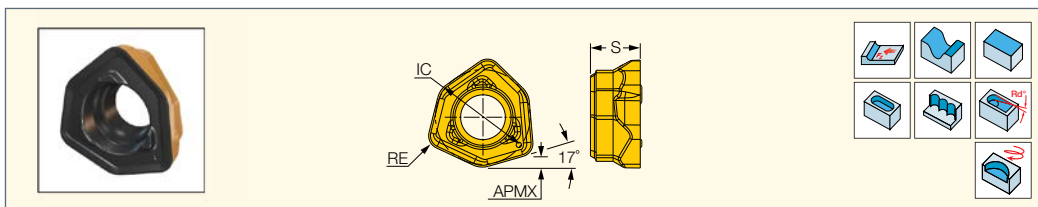
⁽⁹⁾ Master insert identification

⁽¹⁰⁾ Recommended tightening torque (Nm) for insert screw

Spare Parts

Designation		
FFT3 EFM-02	SR M2X0.4-2.9 T6-HG	T-6/5 MAGNET 3X3

FFT3 WXMT 03

 Single-Sided Small Trigon
 Inserts for Fast Feed Milling


Designation	Dimensions				Tough ↔ Hard				Recommended Machining Data	
	IC	S	RE	APMX	IC882	IC830	IC5820	IC808	a_p (mm)	f_z (mm/t)
FFT3 WXMT 030206T	4.20	2.20	0.60	0.60	●	●	●	●	0.20-0.60	0.20-0.80

- For side plunging, the initial cutting feed is 0.08 mm/t

Recommended Machining Conditions for FFT3-03 Fast Feed Endmills

Workpiece Material						Carbide Grade	D.O.C. a _p (mm)	Cutting Speed v _c (m/min)	Feed f _z (mm/tooth)	Coolant
ISO Class DIN/ ISO 513	Description	ISCAR Mat. Group*	Hardness, HB	Typical Materials						
				AISI/SAE/ ASTM	DIN W.-Nr.					
P	non-alloy steel and cast steel, free cutting steel	1-5	130-180	1020	1.0402	IC808	0.20-0.60	120-200	0.30-0.80	dry/wet
						IC830		110-180	0.30-0.80	
	low alloy and cast steel (less than 5% of alloying elements)	6-8	260-300	4340	1.6582	IC808		100-180	0.30-0.70	
						IC830		90-160	0.30-0.70	
		9	HRC 35-42**	3135	1.5710	IC808		100-160	0.30-0.60	
	IC830					90-150		0.30-0.60		
	high alloyed steel, cast steel and tool steel	10-11	200-220	H13	1.2344	IC808		80-150	0.30-0.60	
						IC830		70-140	0.30-0.60	
	stainless steel and cast steel	12-13	200	420	1.4021	IC808		80-150	0.30-0.60	
						IC830		70-140	0.30-0.60	
M	stainless steel and cast steel	14	200	304L	1.4306	IC830	0.20-0.60	80-120	0.20-0.60	dry
						IC5820		100-160	0.20-0.50	
						IC882		80-130	0.20-0.50	
K	gray cast iron (GG)	15-16	250	class 40	0.6025 (GG25)	IC808	0.20-0.60	150-200	0.30-0.60	dry
	nodular cast iron (GGG)	17-18	200	class 65-45-12	0.7050 (GGG50)	IC808		140-180	0.30-0.60	
S	high temperature alloys and titanium	33-35	340	inconel 718	2.4668	IC882	0.2-0.50	20-30	0.20-0.40	wet
						IC5820		25-35	0.20-0.40	
						IC808		25-35	0.20-0.40	
						IC830		25-30	0.20-0.40	
		36-37	HRC 30-32	AMS R56400	3.7165 (Ti6Al4V ELI)	IC882		25-35	0.20-0.50	
						IC5820		25-40	0.20-0.50	
						IC808		25-35	0.20-0.50	
						IC830		20-30	0.20-0.50	
H	hardened steel	38	HRC 45-49	HARDOX 450 plate		IC808	0.20-0.50	50-75	0.20-0.40	dry/wet
	chilled cast iron	40	400	Ni-hard 1	0.9625			80-100	0.20-0.50	
	cast iron	41	500	A532 IID	0.9645			50-75	0.20-0.40	

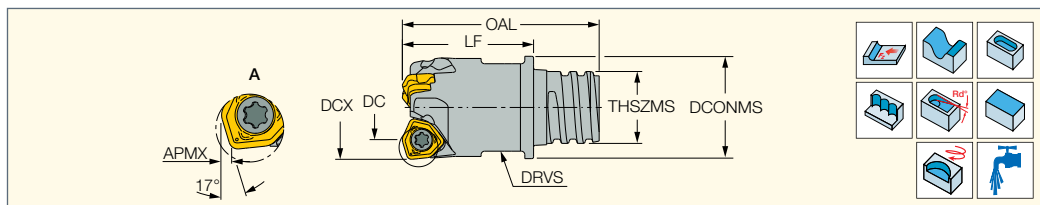
* ISCAR material group based on VDI 3323 standard

** Quenched and tempered

For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

FFT3 EFM-MM 03

Endmills with a MULTI-MASTER
Threaded Adaptation Carrying
Single-Sided Small Trigon
Inserts for Fast Feed Milling



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	LF	DCONMS	THSZMS	OAL	DRVS ⁽⁴⁾	RMPX ⁽⁵⁾	MDN ⁽⁶⁾	MDX ⁽⁷⁾	MIID ⁽⁸⁾	CSP ⁽⁹⁾	kg
FFT3 EFMD10/39-2MMT06-03	10.00	5.60	0.60	2.2	2	10.00	9.70	T06	16.30	8.0	6.9	15.60	19.00	FFT3 WXMT 030206T	1	0.02
FFT3 EFMD12/47-3MMT08-03	12.00	7.60	0.60	2.2	3	15.00	11.70	T08	22.50	10.0	4.7	19.60	23.00	FFT3 WXMT 030206T	1	0.03
FFT3 EFMD16/63-4MMT10-03	16.00	11.60	0.60	2.2	4	20.00	15.30	T10	31.30	13.0	2.9	27.60	31.00	FFT3 WXMT 030206T	1	0.05
FFT3 EFMD20/78-5MMT12-03	20.00	15.60	0.60	2.2	5	25.00	19.00	T12	38.30	16.0	2.0	35.60	39.00	FFT3 WXMT 030206T	1	0.07
FFT3 EFMD25/98-6MMT15-03	25.00	20.60	0.60	2.2	6	30.00	24.00	T15	47.00	20.0	1.5	45.60	49.00	FFT3 WXMT 030206T	1	0.16

• Radius for programming 1.0 mm • To generate a straight surface without cusps, the width of cut must not exceed DC

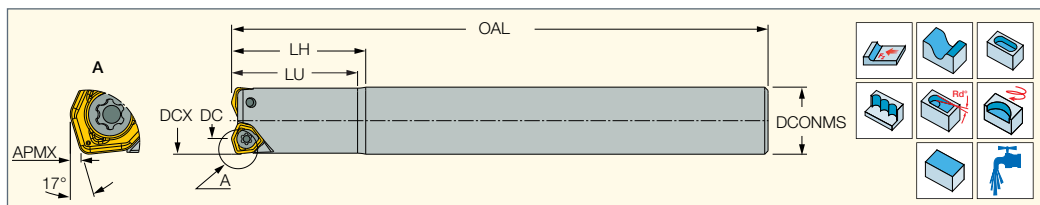
- (1) Cutting diameter maximum
 (2) Maximum plunging width
 (3) Number of inserts (or edges for solid tool)
 (4) Torque key size
 (5) Maximum ramping angle
 (6) Machinable diameter minimum for interpolation
 (7) Machinable diameter maximum for interpolation
 (8) Master insert identification
 (9) 0 - Without coolant supply, 1 - With coolant supply

Spare Parts

Designation		
FFT3 EFM-MM 03	TS 18041/HG	T-6IP/51

FFT3 EFM-03

Endmills Carrying Single-Sided
Small Trigon Inserts for
Fast Feed Milling



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	LU	LH	DCONMS	OAL	Shank ⁽⁴⁾	RMPX ⁽⁵⁾	MDN ⁽⁶⁾	MDX ⁽⁷⁾	MIID ⁽⁸⁾	CSP ⁽⁹⁾	kg
FFT3 EFM D08-1-080-C12-03	8.00	3.60	0.60	2.2	1	15.70	20.0	12.00	80.00	C	1.1	11.60	15.00	FFT3 WXMT 030206T	1	0.00
FFT3 EFM D10-2-080-C10-03	10.00	5.60	0.60	2.2	2	18.00	20.0	10.00	80.00	C	6.9	15.60	19.00	FFT3 WXMT 030206T	1	0.11
FFT3 EFM D12-3-120-C12-03	12.00	7.60	0.60	2.2	3	23.00	25.0	12.00	120.00	C	4.7	19.60	23.00	FFT3 WXMT 030206T	1	0.10
FFT3 EFM D16-4-140-C16-03	16.00	11.60	0.60	2.2	4	32.80	35.0	16.00	140.00	C	2.9	27.60	31.00	FFT3 WXMT 030206T	1	0.18
FFT3 EFM D20-5-160-C20-03	20.00	15.60	0.60	2.2	5	40.80	43.0	20.00	160.00	C	2.0	35.60	39.00	FFT3 WXMT 030206T	1	0.37
FFT3 EFM D25-6-180-C25-03	25.00	20.60	0.60	2.2	6	50.80	53.0	25.00	180.00	C	1.5	45.60	49.00	FFT3 WXMT 030206T	1	0.62

• Radius for programming 1.0 mm • To generate a straight surface without cusps, the width of cut must not exceed DC

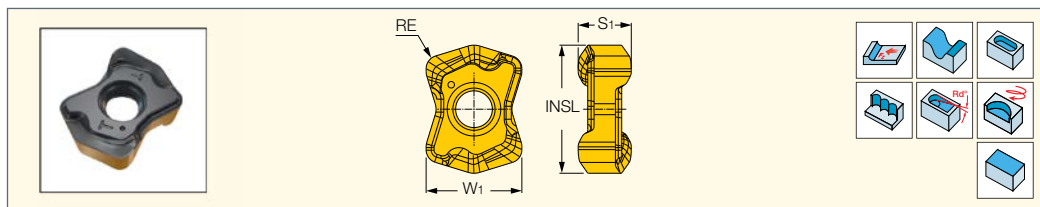
- (1) Cutting diameter maximum
 (2) Maximum plunging width
 (3) Number of inserts (or edges for solid tool)
 (4) C-Cylindrical
 (5) Maximum ramping angle
 (6) Machinable diameter minimum for interpolation
 (7) Machinable diameter maximum for interpolation
 (8) Master insert identification
 (9) 0 - Without coolant supply, 1 - With coolant supply

Spare Parts

Designation		
FFT3 EFM-03	TS 18041/HG	T-6IP/51

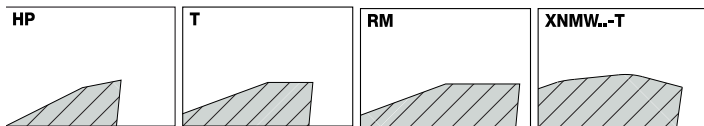
FFX4 XNMU/W-04

"Bone Shaped" Inserts
with 4 Cutting Edges
for Fast Feed Milling



Designation	Dimensions				Tough $\longleftrightarrow$ Hard								Recommended Machining Data	
	INSL	S1	RE	W1	IC882	IC716	IC840	IC830	IC5820	IC808	IC810	IC5600	a_p (mm)	f_z (mm/t)
FFX4 XNMU 040310HP	9.58	3.97	1.00	7.16	•	•	•	•	•	•			0.20-0.80	0.20-0.80
FFX4 XNMU 040310RM-HP	9.58	3.97	1.00	7.16	•					•			0.20-0.80	0.20-0.80
FFX4 XNMU 040310RM-T	9.58	3.95	1.00	7.16						•			0.20-0.80	0.40-1.20
FFX4 XNMU 040310T	9.58	3.95	1.00	7.16				•		•	•	•	0.20-0.80	0.40-1.20
FFX4 XNMW 040310T	9.27	3.97	1.14	7.16						•			0.20-0.60	0.20-0.70

• For side plunging, the initial cutting feed is 0.1 mm/t • HP- for austenitic stainless steel, titanium and high temperature alloys • RM-reinforced type insert • T- for steel, ferritic and martensitic stainless steel and cast iron • XNMW-T- for hard material (up to 49 HRC) and uneven surfaces


Average Cutting Data for FFX4 Fast Feed Cutters Size 04

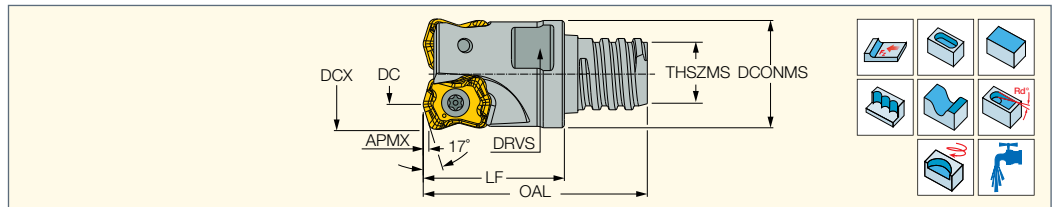
ISO class DIN/ ISO 513	Description	Workpiece material				Insert type	Carbide grade	D.O.C. ap (mm)	Cutting Speed & Feed		Coolant
		ISCAR mat. group*	Hardness HB	Typical materials					vc (m/min)	fz (mm/tooth)	
				AISI/SAE/ ASTM	DIN W.-Nr.						
P	non-alloy steel	1-5	130-180	1020	1.040	T/RM-T	IC808	0.20-0.80	150-220	0.40-1.00	dry
	low alloy steel	6-8	260-300	4340	1.658		IC830		150-200	0.40-1.20	dry/wet
							IC808		150-200	0.40-0.90	dry
							IC830		120-180	0.40-1.10	dry/wet
		9	HRC 35-42**	3135	1.5710		IC808		130-180	0.40-0.80	dry
							IC830		120-160	0.40-1.00	dry/wet
	high alloy steel	10-11	200-220	H13	1.234		IC808		120-170	0.40-0.80	dry
							IC830		100-150	0.40-0.90	dry/wet
	ferritic/martensitic stainless steel	12-13	200	420	1.402		IC808		110-160	0.40-0.80	dry
							IC830		100-150	0.40-0.90	dry/wet
M	austenitic stainless steel	14	200	304L	1.431	HP/ RM-HP	IC830	0.20-0.80	80-120	0.20-0.80	wet
							IC840		80-140	0.20-0.80	
							IC5820		100-160	0.20-0.80	
							IC882		80-130	0.20-0.80	
K	grey cast iron	15-16	250	class 40	0.6025 (GG25)	T/RM-T	IC810	0.20-0.80	150-220	0.40-1.20	dry
	nodular cast iron	17-18	200	class 65-45-12	0.7050 (GGG50)		IC810		120-200	0.40-1.20	
S	high temperature alloys and titanium	31-32	220	330	1.486	HP/ RM-HP	IC882	0.20-0.80	40-60	0.20-0.70	wet
							IC5820		40-80	0.20-0.70	
							IC840		40-80	0.20-0.70	
							IC830		40-75	0.20-0.70	
		33-35	340	inconel 718	2.467		IC882		20-30	0.20-0.70	
							IC5820		25-35	0.20-0.70	
							IC840		25-35	0.20-0.70	
							IC830		25-30	0.20-0.70	
		36-37	30-32	AMS R56400	(Ti6Al4V ELI)		IC882		25-35	0.20-0.70	
							IC716		25-35	0.20-0.70	
							IC5820		25-40	0.20-0.70	
							IC840		25-35	0.20-0.70	
							IC830		20-30	0.20-0.70	
H	hardened steel	38	HRC 45-49	HARDOX 450 plate		XNMW	IC808	0.20-0.60	45-65	0.20-0.70	dry

* ISCAR material group based on VDI 3323 standard ** Quenched and tempered

For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

FFX4 ED-MM

Endmills with MULTI-MASTER
Adaptation that Mount
Small "Bone Shaped"
Inserts with 4 Cutting Edges
for Fast Feed Milling



Designation	DCX ⁽¹⁾	DC	CICT ⁽²⁾	APMX	AE ⁽³⁾	THSZMS	LF	OAL	DCONMS	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	DRVS ⁽⁷⁾	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	CSP ⁽¹⁰⁾	kg
FFX4 ED16/.63-2-MMT10-04	16.00	8.60	2	0.80	3.7	T10	20.00	31.30	15.20	4.3	24.60	31.00	13.0	FFX4 XNMU 040310T	0.9	1	0.02
FFX4 ED20/.78-3-MMT12-04	20.00	12.60	3	0.80	3.7	T12	25.00	38.30	18.80	2.7	32.60	39.00	15.0	FFX4 XNMU 040310T	0.9	1	0.04
FFX4 ED25/.98-4-MMT15-04	25.00	17.60	4	0.80	3.7	T15	30.00	47.00	24.00	1.8	42.60	49.00	19.0	FFX4 XNMU 040310T	0.9	1	0.14
FFX4 ED32/1.26-5-MMT21-04	32.00	24.60	5	0.80	3.7	T21	35.00	58.10	29.00	1.2	56.60	63.00	24.0	FFX4 XNMU 040310T	0.9	1	0.19
FFX4 ED40-6-MMT21-04	40.00	32.60	6	0.80	3.7	T21	40.00	63.10	30.00	0.9	72.60	79.00	24.0	FFX4 XNMU 040310T	0.9	1	0.27

• To generate a straight surface without cusps, the width of cut must not exceed DC • Programming radius for inserts XNMU/XNMW: 1.7mm

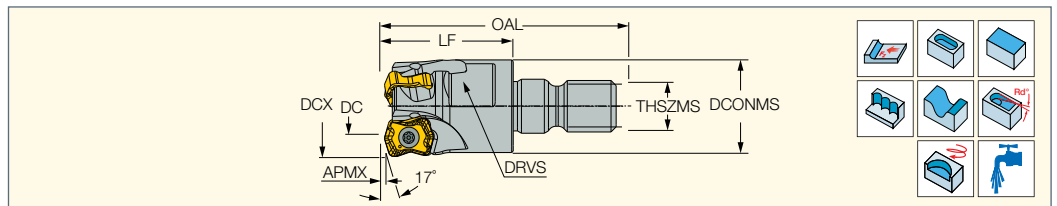
- (1) Cutting diameter maximum
(2) Number of inserts (or edges for solid tool)
(3) Maximum plunging width
(4) Maximum ramping angle
(5) Machinable diameter minimum for interpolation
(6) Machinable diameter maximum for interpolation
(7) Torque key size
(8) Master insert identification
(9) Recommended tightening torque (Nm) for insert screw
(10) 0 - Without coolant supply, 1 - With coolant supply

Spare Parts

Designation		
FFX4 ED-MM	SR M2.5X6-T7-60	T-7/51

FFX4 ED-M

Endmills with FLEX-FIT
Adaptation Carrying Small "Bone
Shaped" Inserts with 4 Cutting
Edges for Fast Feed Milling



Designation	DCX ⁽¹⁾	DC	CICT ⁽²⁾	APMX	AE ⁽³⁾	THSZMS	LF	OAL	DCONMS	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	DRVS ⁽⁷⁾	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	TQ_3 ⁽¹⁰⁾	kg
FFX4 ED20/.78-3-M10-04	20.00	12.60	3	0.80	3.7	M10	25.00	45.00	18.00	2.7	32.60	39.00	15.0	FFX4 XNMU 040310T	0.9	29	0.04
FFX4 ED25/.98-4-M12-04	25.00	17.60	4	0.80	3.7	M12	30.00	52.00	21.00	1.8	42.60	49.00	17.0	FFX4 XNMU 040310T	0.9	33	0.08
FFX4 ED32/1.26-5-M16-04	32.00	24.60	5	0.80	3.7	M16	35.00	60.00	29.00	1.2	56.60	63.00	27.0	FFX4 XNMU 040310T	0.9	40	0.18
FFX4 ED35/1.38-5-M16-04	35.00	27.60	5	0.80	3.7	M16	35.00	60.00	29.00	1.1	62.60	69.00	25.0	FFX4 XNMU 040310T	0.9	40	0.20
FFX4 ED42/1.65-6-M16-04	42.00	34.60	6	0.80	3.7	M16	40.00	65.00	29.00	0.8	76.60	83.00	25.0	FFX4 XNMU 040310T	0.9	40	0.30

• Before mounting the FLEX-FIT adaptation, clean the mating surfaces and threads. Tighten to eliminate gaps, using the torque value from TQ_3. • To generate a straight surface without cusps, the width of cut must not exceed DC • Programming radius for inserts XNMU/XNMW: 1.7mm

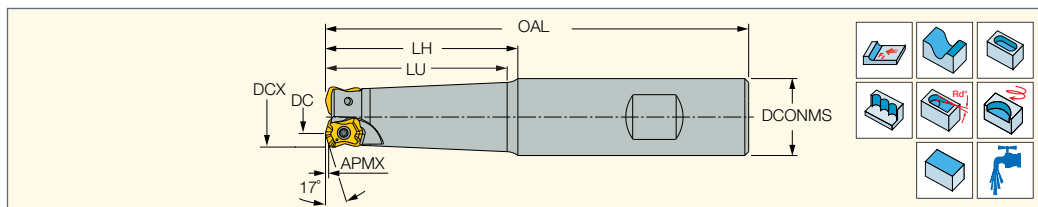
- (1) Cutting diameter maximum
(2) Number of inserts (or edges for solid tool)
(3) Maximum plunging width
(4) Maximum ramping angle
(5) Machinable diameter minimum for interpolation
(6) Machinable diameter maximum for interpolation
(7) Torque key size
(8) Master insert identification
(9) Recommended tightening torque (Nm) for insert screw
(10) Tool tightening torque Nxmm

Spare Parts

Designation		
FFX4 ED-M	SR M2.5X6-T7-60	T-7/51

FFX4 ED

Endmills Carrying Small Double-Sided "Bone Shaped" Inserts with 4 Cutting Edges for Fast Feed Milling



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	LU	LH	DCONMS	OAL	Shank ⁽⁴⁾	KAPR ⁽⁵⁾	RMPX ⁽⁶⁾	MDN ⁽⁷⁾	MDX ⁽⁸⁾	MIID ⁽⁹⁾	TQ (Nm) ⁽¹⁰⁾
FFX4 ED12-1-030-C12-04	12.00	4.60	0.80	3.7	1	28.90	30.0	12.00	90.00	C	17.0	1.5	16.60	23.00	FFX4 XNMU 040310T	0.07
FFX4 ED16-2-030-C16-04	16.00	8.60	0.80	3.7	2	28.30	30.0	16.00	120.00	C	17.0	4.3	24.60	31.00	FFX4 XNMU 040310T	0.16
FFX4 ED16-2-050-W20-04	16.00	8.60	0.80	3.7	2	44.00	50.0	20.00	110.00	W	17.0	4.3	24.60	31.00	FFX4 XNMU 040310T	0.20
FFX4 ED20-3-050-C20-04	20.00	12.60	0.80	3.7	3	47.60	50.0	20.00	140.00	C	17.0	2.7	32.60	39.00	FFX4 XNMU 040310T	0.29
FFX4 ED20-3-060-W20-04	20.00	12.60	0.80	3.7	3	57.60	60.0	20.00	120.00	W	17.0	2.7	32.60	39.00	FFX4 XNMU 040310T	0.24
FFX4 ED25-4-060-C25-04	25.00	17.60	0.80	3.7	4	57.40	60.0	25.00	150.00	C	17.0	1.8	42.60	49.00	FFX4 XNMU 040310T	0.50
FFX4 ED25-4-080-W25-04	25.00	17.60	0.80	3.7	4	77.40	80.0	25.00	140.00	W	17.0	1.8	42.60	49.00	FFX4 XNMU 040310T	0.45
FFX4 ED32-5-080-W32-04	32.00	24.60	0.80	3.7	5	77.40	80.0	32.00	150.00	W	17.0	1.2	56.60	63.00	FFX4 XNMU 040310T	0.80
FFX4 ED32-5-120-C32-04	32.00	24.60	0.80	3.7	5	117.30	120.0	32.00	205.00	C	17.0	1.2	56.60	63.00	FFX4 XNMU 040310T	1.02

• To generate a straight surface without cusps, the width of cut must not exceed DC • Programming radius for inserts XNMU/XNMW: 1.7mm

(1) Cutting diameter maximum

(2) Maximum plunging width

(3) Number of inserts (or edges for solid tool)

(4) C-Cylindrical, W-Weldon

(5) Tool cutting edge angle

(6) Maximum ramping angle

(7) Machinable diameter minimum for interpolation

(8) Machinable diameter maximum for interpolation

(9) Master insert identification

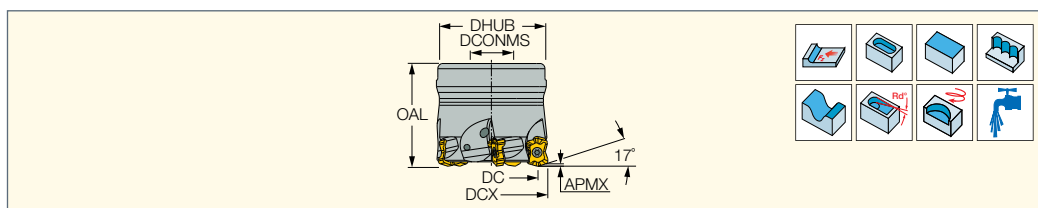
(10) Recommended tightening torque (Nm) for insert screw

Spare Parts

Designation		
FFX4 ED	SR M2.5X6-T7-60	T-7/51

FFX4 FD-04

Face Mills Carrying "Bone Shaped" Inserts with 4 Cutting Edges for Fast Feed Milling



Designation	DCX ⁽¹⁾	DC	CICT ⁽²⁾	APMX	AE ⁽³⁾	OAL	DCONMS	DHUB	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	Arbor	MIID ⁽⁷⁾	CSP ⁽⁸⁾	kg
FFX4 FD032-5-16-04	32.00	24.60	5	0.80	3.7	40.00	16.00	38.00	1.2	56.60	63.00	A	FFX4 XNMU 040310T	1	0.12
FFX4 FD040-6-16-04	40.00	32.60	6	0.80	3.7	40.00	16.00	38.00	0.9	72.60	79.00	A	FFX4 XNMU 040310T	1	0.23
FFX4 FD042-6-16-04	42.00	34.60	6	0.80	3.7	40.00	16.00	38.00	0.8	76.60	83.00	A	FFX4 XNMU 040310T	1	0.50
FFX4 FD050-7-22-04	50.00	42.60	7	0.80	3.7	40.00	22.00	48.00	0.7	92.60	99.00	A	FFX4 XNMU 040310T	1	0.39
FFX4 FD052-7-22-04	52.00	44.60	7	0.80	3.7	40.00	22.00	48.00	0.7	96.60	103.00	A	FFX4 XNMU 040310T	1	0.44

• To generate a straight surface without cusps, the width of cut must not exceed DC • Programming radius for inserts XNMU/XNMW: 1.7mm

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

(3) Maximum plunging width

(4) Maximum ramping angle

(5) Machinable diameter minimum for interpolation

(6) Machinable diameter maximum for interpolation

(7) Master insert identification

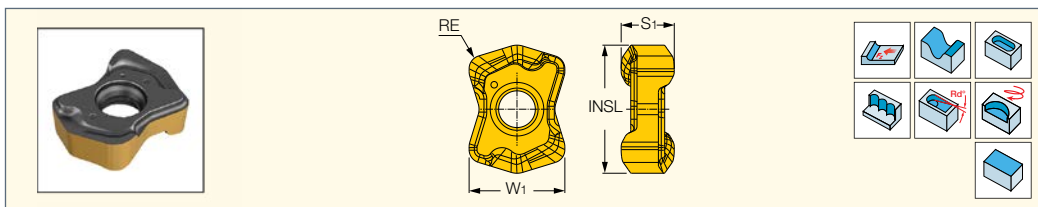
(8) 0 - Without coolant supply, 1 - With coolant supply

Spare Parts

Designation			
FFX4 FD032-5-16-04	SR M2.5X6-T7-60	T-7/51	SR M8X25-D11.5
FFX4 FD040-6-16-04	SR M2.5X6-T7-60	T-7/51	SR M8X25DIN912
FFX4 FD042-6-16-04	SR M2.5X6-T7-60	T-7/51	SR M8X25DIN912
FFX4 FD050-7-22-04	SR M2.5X6-T7-60	T-7/51	SR M10X25 DIN912
FFX4 FD052-7-22-04	SR M2.5X6-T7-60	T-7/51	SR M10X25 DIN912

FFX4 XNMU-08

"Bone Shaped" Inserts
with 4 Cutting Edges
for Fast Feed Milling



Designation	Dimensions				Tough ↔ Hard				Recommended Machining Data	
	INSL	S1	RE	W1	IC882	IC830	IC808	IC810	a_p (mm)	f_z (mm/t)
FFX4 XNMU 080620HP	17.90	7.80	2.00	15.60	●	●	●	●	0.20-2.00	0.20-0.80
FFX4 XNMU 080620T	17.90	7.80	2.00	15.60		●	●	●	0.20-2.00	0.40-1.20

- For side plunging, the initial cutting feed is 0.1 mm/t
- T-for steel, ferritic and martensitic stainless steel, cast iron and hardened steel
- HP-for austenitic stainless steel and high temperature alloys


Average Cutting Data for FFX4 Fast Feed Cutters Size 08

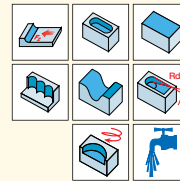
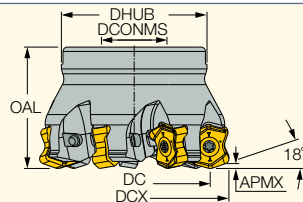
Workpiece material						Insert type	Carbide grade	D.O.C. a _p (mm)	Cutting speed v _c (m/min)	Feed f _z (mm/tooth)	Coolant
ISO class DIN/ISO 513	Description	ISCAR mat. group*	Hardness HB	Typical representative							
				AISI/SAE/ ASTM	DIN W.-Nr.						
P	non-alloy steel	1-5	130-180	1020	1.0402	T	IC808	0.50-2.0	150-180	0.40-1.20	dry
	low alloy steel	6-8	260-300	4340	1.6582		IC830		150-180	0.40-1.20	dry/wet
							IC808		150-180	0.40-1.20	dry
		9	HRC 35-42**	3135	1.5710		IC830		120-180	0.40-1.10	dry/wet
							IC808		130-180	0.40-1.10	dry
	high alloy steel	10-11	200-220	H13	1.2344		IC830		120-160	0.40-1.00	dry/wet
							IC808		120-170	0.40-0.80	dry
	ferritic/martensitic stainless steel	12-13	200	420	1.4021		IC830		100-150	0.40-0.90	dry/wet
IC808						110-160	0.40-0.80	dry			
M	austenitic stainless steel	14	200	304L	1.4306	HP	IC830	0.50-2.0	70-130	0.20-0.80	wet
							IC808		100-160	0.20-0.80	
							IC882		80-140	0.20-0.80	
K	gray cast iron	15-16	250	class 40	0.6025 (GG25)	T	IC810	0.50-2.0	150-220	0.40-1.20	dry
	nodular cast iron	17-18	200	class 65-45-12	0.7050 (GGG50)		IC810		120-200	0.40-1.20	
S	high temperature alloys and titanium	31-32	220	330	1.4864	HP	IC882	0.50-2.0	40-60	0.20-0.70	wet
		33-35	340	inconel 718	2.4668		IC808		40-80	0.20-0.70	
							IC830		40-75	0.20-0.70	
							IC882		20-30	0.20-0.70	
							IC808		25-40	0.20-0.70	
							IC830		25-35	0.20-0.70	
							IC882		30-50	0.20-0.70	
		36-37	30-32	AMS R56400	3.7165 (Ti6Al4V ELI)		IC808		40-60	0.20-0.70	
IC830	35-55					0.20-0.70					
H	hardened steel	38	HRC 45-49	HARDOX 450 plate		T	IC808	0.50-2.0	50-75	0.20-0.50	dry

* ISCAR material group based on VDI 3323 standard ** Quenched and tempered

For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

FFX4 FD-08

Face Mills Carrying "Bone Shaped" Inserts with 4 Cutting Edges for Fast Feed Milling



Designation	DCX ⁽¹⁾	DC	CICT ⁽²⁾	APMX	AE	OAL	DCONMS	DHUB	Rd°	MDN ⁽³⁾	MDX ⁽⁴⁾	Arbor	CSP ⁽⁵⁾	MIID ⁽⁶⁾	
FFX4 FD050-4-22-08	50.00	34.40	4	2.00	7.8	50.00	22.00	48.00	3.3	84.40	99.00	A	1	FFX4 XNMU 080620	0.58
FFX4 FD063-5-22-08	63.00	47.40	5	2.00	7.8	45.00	22.00	48.00	2.3	110.40	125.00	A	1	FFX4 XNMU 080620T	0.48
FFX4 FD080-7-27-08	80.00	64.40	7	2.00	7.8	50.00	27.00	60.00	1.6	144.40	159.00	B	1	FFX4 XNMU 080620T	0.95
FFX4 FD100-8-32-08	100.00	84.40	8	2.00	7.8	50.00	32.00	78.00	1.2	184.40	199.00	B	1	FFX4 XNMU 080620T	1.24
FFX4 FD125-10-40-08	125.00	109.40	10	2.00	7.8	63.00	40.00	92.00	0.9	234.40	249.00	B	1	FFX4 XNMU 080620T	2.40

- To generate a straight surface without cusps, the width of cut must not exceed DC
- Radius programming for insert XNMU 3.9 mm

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

(3) Machinable diameter minimum for interpolation

(4) Machinable diameter maximum for interpolation

(5) 0 - Without coolant supply, 1 - With coolant supply

(6) Master insert identification

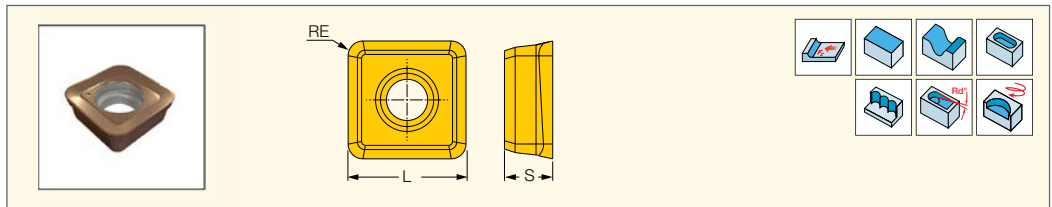
Spare Parts

Designation				
FFX4 FD050-4-22-08	SR M5-14 IP20	SW6-T	BLD IP20/S7	SR PS 118-0273
FFX4 FD063-5-22-08	SR M5-14 IP20	SW6-T	BLD IP20/S7	SR M10X25 DIN912
FFX4 FD080-7-27-08	SR M5-14 IP20	SW6-T	BLD IP20/S7	SR M12X30DIN912
FFX4 FD100-8-32-08	SR M5-14 IP20	SW6-T	BLD IP20/S7	
FFX4 FD125-10-40-08	SR M5-14 IP20	SW6-T	BLD IP20/S7	



FFQ4 SOMT/W 0602

Single-Sided Square Inserts
with 4 Cutting Edges
for Fast Feed Milling



Designation	Dimensions			Tough $\longleftrightarrow$ Hard					Recommended Machining Data	
	L	S	RE	IC882	IC840	IC830	IC08	IC808	a_p (mm)	f_z (mm/t)
FFQ4 SOMT 060210HP	5.50	2.00	1.00	●	●			●	0.20-0.70	0.20-0.90
FFQ4 SOMT 060210HP-P	5.50	2.00	1.00				●		0.20-0.70	0.20-0.90
FFQ4 SOMT 060210T	5.50	2.04	1.00			●		●	0.20-0.70	0.20-1.00
FFQ4 SOMT 0602RM-HP	5.58	2.00	1.00	●					0.20-0.70	0.20-0.90
FFQ4 SOMW 060213T	5.60	2.11	1.30					●	0.20-0.60	0.20-0.40

- For side plunging, the initial cutting feed is 0.1 mm/t
- T type for steel, ferritic and martensitic stainless steel and cast iron
- HP type for austenitic stainless steel and high temperature alloys
- SOMW- flat insert for hard material (up to 60 HRC) and uneven surface

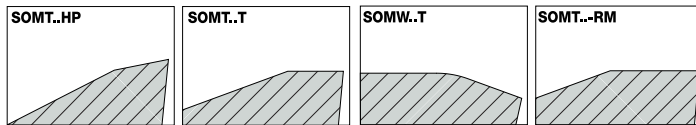


Table – Recommended Machining Conditioning for Fast Feed Endmills FFQ4 Size 06 – Metric
Based on ISO 513 and VDI 3323 Standards

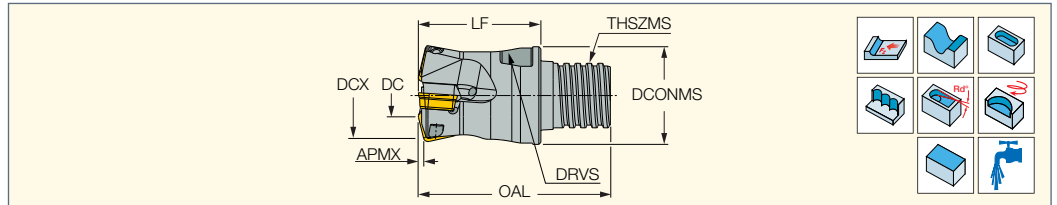
ISO	Material Group No.			Hardness HB	Type of Insert	Depth of cut (mm)	Cutting Speed v_c (m/min) for Grades					Feed f_z (mm/tooth)	
							IC808	IC830	IC840	IC882	IC08		
P	1	non-alloy	<0.25% C	annealed	125	T	0.2-0.7	150-220	140-210	-	-	-	0.4-1.0
	2	steel and cast	$\geq 0.25\%$ C	annealed	190			130-210	120-200	-	-	-	
	3	steel, free	<0.55% C	quenched and tempered	250			120-200	110-190	-	-	-	
	4	cutting steel	$\geq 0.55\%$ C	annealed	220			120-190	110-180	-	-	-	
	5		quenched and tempered	300	110-180			100-170	-	-	-		
	6	low alloy and cast steel (less than 5% of alloying elements)	annealed	200	120-190			110-180	-	-	-		
	7			275	110-180			100-170	-	-	-		
	8		quenched and tempered	300	115-170			100-160	-	-	-		
	9			350	110-170			100-160	-	-	-		
	10		high alloyed steel, cast	annealed	200			120-170	110-160	-	-	-	
	11	steel and tool steel	quenched and tempered	325	100-150			90-140	-	-	-		
	12	stainless steel	ferritic/martensitic	200	110-160			100-150	-	-	-		
	13	and cast steel	martensitic	240	100-150			90-135	-	-	-		
M	14	stainless steel and cast steel	austenitic, duplex	180	HP / RM-HP	0.2-0.7	-	-	90-160	90-160	-	0.4-0.9	
K	15	gray cast iron (GG)	ferritic / pearlitic	180	T	0.2-0.7	150-220	140-210	-	-	-	0.4-1.0	
	16		pearlitic / martensitic	260			-	-	-	-			
	17	nodular cast iron (GGG)	ferritic	160			120-200	120-190	-	-	-		
	18		pearlitic	250			-	-	-	-			
	19	malleable cast iron	ferritic	130			130-210	115-200	-	-	-		
N	20		pearlitic	230			-	-	-				
	21	aluminum-wrought alloys		60	HP-P	0.2-0.7	-	-	-	-	530-710	0.3-0.9	
	22			100			-	-	-	-	450-620		
	23	aluminum-cast alloys	$\leq 12\%$ Si	75			-	-	-	-	530-710		
	24			90			-	-	-	-	450-620		
25	$> 12\%$ Si		130	-			-	-	-	265-355			
S	31	high temperature alloys	Fe based	annealed	200	HP / RM-HP	0.2-0.5	-	-	55-70	50-65	-	0.4-0.6
	32		hardened	280	-			-	50-60	45-55	-		
	33		Ni or Co based	annealed	250			-	-	35-45	30-40	-	0.4-0.7
	34	hardened		350	-			-	30-35	25-35	-		
	35	cast		320	-			-	25-35	25-35	-	0.4-0.6	
	36	pure	190	-	-			60-70	50-60	-			
37	titanium alloys	alpha+beta alloys, hardened	310	-	-	35-50	35-45	-					
H	38	hardened steel	hardened	55 HRC	SOMW	0.2-0.5	60-80	-	-	-	-	0.3-0.4	
	39		hardened	60 HRC			40-50	-	-	-	-		
	40	chilled cast iron	cast	400			80-100	-	-	-	-		
	41	cast iron	hardened	55 HRC			40-60	-	-	-	-		

For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

Steel
Stainless Steel
Cast Iron
Non-Ferrous Metals
Superalloys and Titanium
Hard Materials

FFQ4 D-MM-06

Fast Feed Endmills with
MULTI-MASTER Threaded
Adaptation Carrying Single-Sided
Square Inserts with 4
Cutting Edges



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	THSZMS	LF	OAL	DCONMS	DRVS ⁽⁴⁾	RMPX ⁽⁵⁾	CSP ⁽⁶⁾	MDN	MDX	TQ ₃ ⁽⁷⁾	MIID ⁽⁸⁾	TQ (Nm)	kg
FFQ4 D16/.63-03-MMT10-06	16.00	7.20	0.70	4.4	3	T10	16.0027.30	15.20	13.0	6.0	1	23.20	31.00	28	FFQ4 SOMT 060210T	0.9	0.02	
FFQ4 D20-04-MMT12-06	20.00	11.20	0.70	4.4	4	T12	25.0038.30	18.80	16.0	3.5	1	31.20	39.00	28	FFQ4 SOMT 060210T	0.9	0.05	
FFQ4 D25/.98-05-MMT15-06	25.00	16.20	0.70	4.4	5	T15	30.0047.00	24.00	20.0	2.2	1	41.20	49.00	40	FFQ4 SOMT 060210T	0.9	0.09	
FFQ4 D32/1.26-07-MMT21-06	32.00	23.20	0.70	4.4	7	T21	30.0053.10	29.40	24.0	1.4	1	55.20	63.00	110	FFQ4 SOMT 060210T	0.9	0.17	

- Do not apply lubricant to the MULTI-MASTER threaded connection • To generate a straight surface without cusps, the width of cut must not exceed DC.
- Radius for programming: for insert SOMT 1.7 mm, for insert SOMW 1.9 mm. • When mounting insert SOMW, APMX=0.6 mm
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 50%.

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Maximum plunging width

⁽³⁾ Number of inserts (or edges for solid tool)

⁽⁴⁾ Torque key size

⁽⁵⁾ Maximum ramping angle

⁽⁶⁾ 0 - Without coolant supply, 1 - With coolant supply

⁽⁷⁾ Tool tightening torque Nxm

⁽⁸⁾ Master insert identification

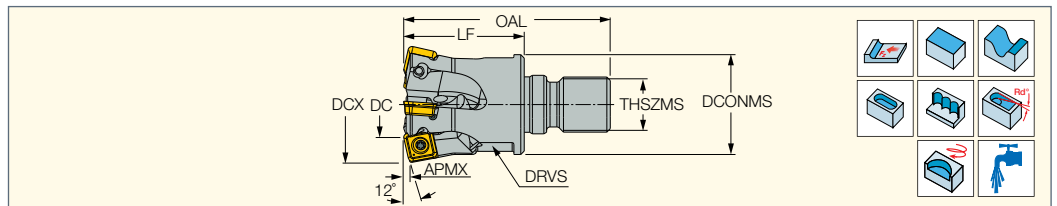
Spare Parts

Designation		
FFQ4 D-MM-06	SR 10516050-L4.6	IP-7/51 ^(a)

^(a) For limiting torque, use optional 7007378 BLD 4 IP07-0.9NM blade & 7007318 HSD 4-0.9NM handle.

FFQ4 D-M-06

Fast Feed Endmills with FLEX-
FIT Threaded Adaptation
Carrying Single-Sided Square
Inserts with 4 Cutting Edges



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	LF	OAL	DCONMS	THSZMS	RMPX ⁽⁴⁾	MDN	MDX	DRVS ⁽⁵⁾	MIID ⁽⁶⁾	kg	TQ (Nm)	TQ ₃ ⁽⁷⁾
FFQ4 D20-04-M10-06	20.00	11.20	0.70	4.4	4	25.00	45.00	18.00	M10	3.5	31.20	39.00	15.1	FFQ4 SOMT 060210T	0.04	0.9	29
FFQ4 D25-05-M12-06	25.00	16.20	0.70	4.4	5	30.00	52.00	21.00	M12	2.2	41.20	49.00	17.1	FFQ4 SOMT 060210T	0.18	0.9	33
FFQ4 D32-07-M16-06	32.00	23.20	0.70	4.4	7	30.00	55.00	29.40	M16	1.4	55.20	63.00	25.1	FFQ4 SOMT 060210T	0.16	0.9	40
FFQ4 D35-08-M16-06	35.00	26.20	0.70	4.4	8	35.00	60.00	29.00	M16	1.4	61.20	69.00	25.1	FFQ4 SOMT 060210T	0.20	0.9	40
FFQ4 D40-09-M16-06	40.00	31.20	0.70	4.4	9	35.00	60.00	29.00	M16	1.0	71.20	79.00	25.1	FFQ4 SOMT 060210T	0.20	0.9	40

- To generate a straight surface without cusps, the width of cut must not exceed DC • Radius for programming: for insert SOMT 1.7 mm, for insert SOMW 1.9 mm
- When mounting insert SOMW, APMX=0.6 mm • For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 50%

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Maximum plunging width

⁽³⁾ Number of inserts (or edges for solid tool)

⁽⁴⁾ Maximum ramping angle

⁽⁵⁾ Torque key size

⁽⁶⁾ Master insert identification

⁽⁷⁾ Tool tightening torque Nxm

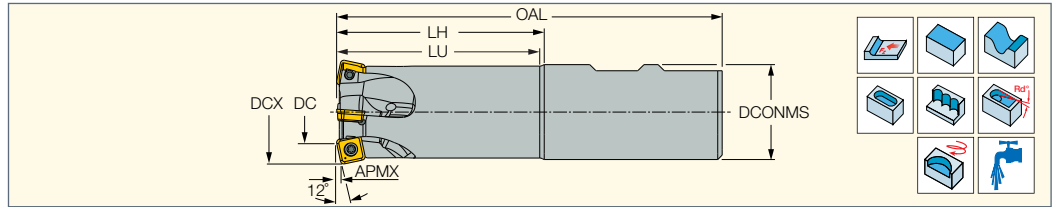
Spare Parts

Designation			
FFQ4 D-M-06	SR 10516050-L4.6	IP-7/51	IP-7/51 ^(a)

^(a) For limiting torque, use optional 7007378 BLD 4 IP07-0.9NM blade & 7007318 HSD 4-0.9NM handle.

FFQ4 D-C/W-06

Fast Feed Endmills Carrying
Single-Sided Square Inserts
with 4 Cutting Edges



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	LU	LH	DCONMS	OAL	Shank	RMPX ⁽⁴⁾	MDN	MDX	MIID ⁽⁵⁾	CSP ⁽⁶⁾	TQ (Nm)
FFQ4 D16-03-C16-06	16.00	7.20	0.70	4.4	3	24.50	26.0	16.00	90.00	C	6.0	23.20	31.00	FFQ4 SOMT 060210T	1	0.11
FFQ4 D20-04-C20-06	20.00	11.20	0.70	4.4	4	40.00	42.0	20.00	130.00	C	3.5	31.20	39.00	FFQ4 SOMT 060210T	1	0.27
FFQ4 D25-05-W25-06	25.00	16.20	0.70	4.4	5	50.00	52.0	25.00	110.00	W	2.2	41.20	49.00	FFQ4 SOMT 060210T	1	0.33
FFQ4 D32-07-W32-06	32.00	23.20	0.70	4.4	7	64.00	66.0	32.00	130.00	W	1.4	55.20	63.00	FFQ4 SOMT 060210T	1	0.68

- To generate a straight surface without cusps, the width of cut must not exceed DC
- Radius for programming: for insert SOMT 1.7 mm, for insert SOMW 1.9 mm
- When mounting insert SOMW, APMX=0.6 mm
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 50%

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Maximum plunging width

⁽³⁾ Number of inserts (or edges for solid tool)

⁽⁴⁾ Maximum ramping angle

⁽⁵⁾ Master insert identification

⁽⁶⁾ 0 - Without coolant supply, 1 - With coolant supply

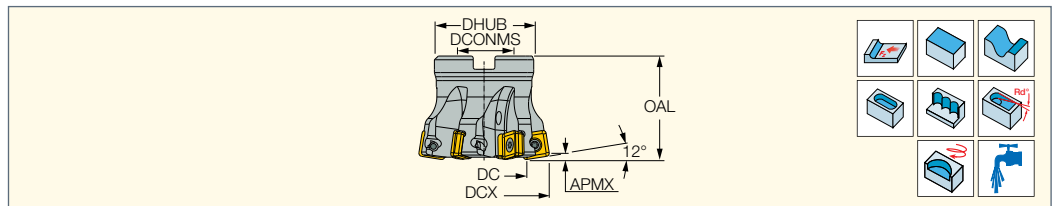
Spare Parts

Designation		
FFQ4 D-C/W-06	SR 10516050-L4.6	IP-7/51 ^(a)

^(a) For limiting torque, use optional 7007378 BLD 4 IP07-0.9NM blade & 7007318 HSD 4-0.9NM handle.

FFQ4 D-06

Fast Feed Face Mills Carrying
Single-Sided Square Inserts
with 4 Cutting Edges



Designation	DC	DCX ⁽¹⁾	APMX	AE	CICT ⁽²⁾	OAL	DCONMS	DHUB	RMPX ⁽³⁾	CSP ⁽⁴⁾	MDN	MDX	Arbor	MIID ⁽⁵⁾	TQ (Nm)
FFQ4 D40-09-16-06	31.20	40.00	0.70	4.4	9	40.00	16.00	38.00	1.0	1	71.20	79.00	A	FFQ4 SOMT 060210T	0.00
FFQ4 D50-10-22-06	41.20	50.00	0.70	4.4	10	40.00	22.00	47.00	0.7	1	91.20	99.00	A	FFQ4 SOMT 060210T	0.00

- To generate a straight surface without cusps, the width of cut must not exceed DC
- Programming radius for insert SOMT 1.7mm, for insert SOMW 1.9mm
- When mounting insert SOMW, APMX=0.6mm
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 50%

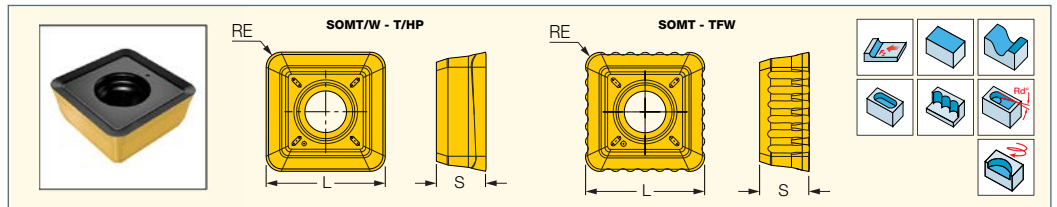
⁽¹⁾ Cutting diameter maximum

⁽²⁾ Number of inserts (or edges for solid tool)

⁽³⁾ Maximum ramping angle

⁽⁴⁾ 0 - Without coolant supply, 1 - With coolant supply

⁽⁵⁾ Master insert identification

FFQ4 SOMT/W 0904
 Single-Sided Square Inserts
 with 4 Cutting Edges
 for Fast Feed Milling


Designation	Dimensions			Tough ↔ Hard							Recommended Machining Data		
	L	S	RE	IC882	IC28	IC716	IC830	IC5820	IC808	IC810	IC5600	a _p (mm)	f _z (mm/t)
FFQ4 SOMT 090412T	8.50	3.90	1.20				●		●	●	●	0.50-1.20	0.40-1.50
FFQ4 SOMT 0904RM-T	8.60	3.80	1.20						●			0.50-1.20	0.40-1.50
FFQ4 SOMT 0904RM-HP	8.60	3.80	1.20	●		●						0.50-1.20	0.40-1.50
FFQ4 SOMT 090412HP	8.50	3.80	1.20	●		●	●	●	●			0.50-1.20	0.40-1.40
FFQ4 SOMT 090412HP-P	8.50	3.80	1.20		●							0.50-1.20	0.40-1.40
FFQ4 SOMW 090420T	8.80	3.90	2.00						●			0.30-1.00	0.20-1.00
FFQ4 SOMT 090412TFW	8.50	3.80	1.20						●			0.50-1.20	0.40-1.00

- For side plunging, the initial cutting feed is 0.1 mm/t • T type for steel, ferritic and martensitic stainless steel and cast iron
- RM-... reinforced radius type for machining near straight shoulder walls • HP type for austenitic stainless steel and high temperature alloys
- SOMW- flat insert for hard material (up to 60 HRC) and uneven surface

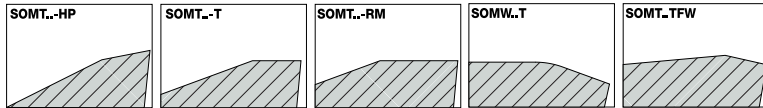


Table – Recommended Machining Conditioning for Fast Feed Endmills FFQ4 Size 09 – Metric
Based on ISO 513 and VDI 3323 Standards

Workpiece Material						Insert type	Carbide grade	D.O.C. a _p (mm)		Cutting speed v _c (m/min)	Feed f _z (mm/tooth)		Coolant	
ISO	Material Group No.	Material	Hardness HB	Typical representative				Recom- mended	Range		Recom- mended	Range		
				AISI/SAE/ ASTM	DIN W.-Nr.									
P	non-alloy steel	1-5	130-180	1020	1.0402	T/ RM-T	IC808	1.0	0.4-1.2	150-220	1.2	0.5-1.5	dry	
	low alloy steel	6-8	260-300	4340	1.6582		IC830			140-200	1.3	0.5-1.5	dry/wet	
							IC808			140-200	1.2	0.5-1.5	dry	
							IC830			120-180	1.3	0.5-1.5	dry/wet	
							IC808			130-180	1.2	0.5-1.4	dry	
		IC830	120-160	1.2	0.5-1.4		dry/wet							
	high alloy steel	10-11	200-220	H13	1.2344		IC808			120-170	1.2	0.5-1.4	dry	
							IC830			100-150	1.3	0.5-1.4	dry/wet	
							IC808			110-160	1.2	0.5-1.4	dry	
ferritic/martensitic	12-13	200	420	1.4021	IC830	100-150	1.3	0.5-1.4	dry/wet					
M	austenitic stainless steel	14	200	304L	1.4306	HP/ RM-HP	IC830	1.0	0.4-1.2	80-120	1.0	0.5-1.2	wet	
							IC808			100-160		0.5-1.2		
							IC5820			100-160		0.5-1.3		
							IC882			80-130		0.5-1.4		
K	gray cast iron	15-16	250	class 40	0.6025 (GG25)	T/ RM-T	IC810	1.2	0.4-1.2	150-220	1.2	0.5-1.5	dry	
	nodular cast iron	17-18	200	class 65-45-12	0.7050 (GGG50)		IC810			120-200		0.5-1.5		
N	aluminum-wrought alloys	21-24	60-100	7075	3.4365	HP-P	IC28	1.2	0.4-1.2	250-450	0.7	0.3-1.4	wet	
	aluminum-cast alloys	25	130	A03930	G-AlSi20MgNi					180-280		0.3-1.4		
S	high temperature alloys and titanium	33-35	340	Inconel 718	2.4668	HP/ RM-HP	IC830	1.0	0.4-1.2	25-30	0.5	0.5-1.0	wet	
							IC808			25-35		0.5-1.0		
							IC5820			25-35		0.5-1.0		
							IC882			20-30		0.5-1.0		
							IC830			20-30		0.5-1.0		
		36-37	HRC 35-40	AMS R56400	3.7165 (Ti6Al4V ELI)		IC808			35-60	0.6	0.5-1.0		
							IC5820			25-40		0.5-1.0		
							IC716			25-35		0.5-1.0		
							IC882			25-35		0.5-1.0		
H	hardened steel	38	HRC 45-49	HARDOX 450 plate		SOMW	IC808	0.6	0.3-1.0	45-65	0.5	0.3-1.0	dry	
			HRC 58-62	D2	1.2379			0.4	0.3-0.5	40-60	0.4	0.3-0.5		

For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

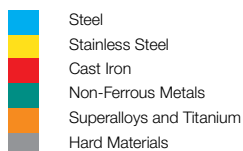


Table – Recommended Machining Conditioning for Insert Geometry TFW

Based on ISO 513 and VDI 3323 standards

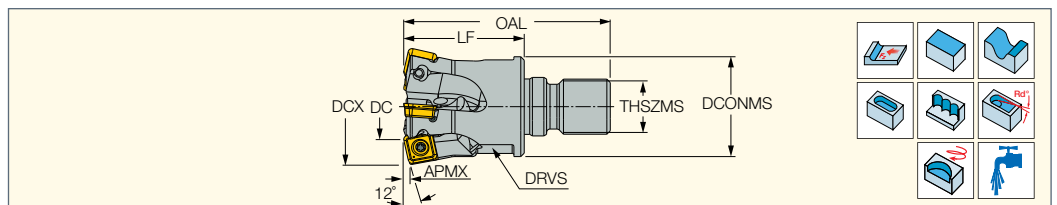
ISO	Material Group No.			Hardness HB	Type of Insert	Depth of Cut (mm)			Cutting Speed v_c (m/min)	Feed f_z (mm/tooth)		
						Insert Size 09 (mm)	Insert Size 12 (mm)	Insert Size 17 (mm)		Insert Size 09 (mm)	Insert Size 12 (mm)	Insert Size 17 (mm)
P	1	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	125	0.3-1.2	0.7-1.5	1.5-3.0	150-220	0.4-1.0	0.4-1.2	0.4-1.2
	2		$\geq 0.25\%$ C	annealed	190				130-210			
	3		<0.55% C	quenched and tempered	250				120-200			
	4		$\geq 0.55\%$ C	annealed	220				120-190			
	5			quenched and tempered	300				110-180			
	6	low alloy and cast steel (less than 5% of alloying elements)	annealed	200	0.3-1.2	0.7-1.5	1.5-3.0	120-190				
	7		quenched and tempered	275				110-180				
	8			300				115-170				
	9			350				110-170				
	10	high alloyed steel, cast steel and tool steel	annealed	200	0.3-1.2	0.7-1.5	1.5-3.0	120-170				
	11		quenched and tempered	325				100-150				
	12	stainless steel and cast steel	ferritic/martensitic	200				110-160				
	13		martensitic	240				100-150				
K	15	gray cast iron (GG)	ferritic / pearlitic	180	TFW	0.3-1.2	0.7-1.5	1.5-3.0	150-220	0.4-1.0	0.4-1.2	0.4-1.2
	16		pearlitic / martensitic	260								
	17	nodular cast iron (GGG)	ferritic	160					120-200			
	18		pearlitic	250								
	19	malleable cast iron	ferritic	130					130-210			
	20		pearlitic	230								
H	40	chilled cast iron	cast	400	TFW	0.3-1.2	0.7-1.5	1.5-3.0	80-100	0.4-1.0	0.4-1.2	0.4-1.2

	Steel
	Cast Iron
	Hard Materials

MILL4FEED

FFQ4 D-M-09

Fast Feed Endmills with FLEX-FIT
Threaded Adaptation Carrying
Single-Sided Square Inserts
with 4 Cutting Edges



Designation	DC	DCX ⁽¹⁾	APMX	AE ⁽²⁾	CICT ⁽³⁾	LF	OAL	DCONMS	THSZMS	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	DRVS ⁽⁷⁾	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	TQ_3 ⁽¹⁰⁾	CSP ⁽¹¹⁾	
FFQ4 D022-02-M10-09	7.70	22.00	1.20	7.1	2	25.00	45.00	18.00	M10	8.2	29.70	43.00	15.0	FFQ4 SOMT 090412T	2.0	29	1	0.04
FFQ4 D025-02-M12-09	10.70	25.00	1.20	7.1	2	30.00	52.00	21.00	M12	5.5	35.70	49.00	17.0	FFQ4 SOMT 090412T	2.0	33	1	0.05
FFQ4 D025-03-M12-09	10.70	25.00	1.20	7.1	3	30.00	52.00	21.00	M12	5.5	35.70	49.00	17.0	FFQ4 SOMT 090412T	2.0	33	1	0.07
FFQ4 D032-03-M16-09	17.70	32.00	1.20	7.1	3	35.00	60.00	29.00	M16	3.2	49.70	63.00	25.0	FFQ4 SOMT 090412T	2.0	40	1	0.14
FFQ4 D032-04-M16-09	17.70	32.00	1.20	7.1	4	35.00	60.00	29.00	M16	3.2	49.70	63.00	25.0	FFQ4 SOMT 090412T	2.0	40	1	0.14
FFQ4 D035-05-M16-09	20.70	35.00	1.20	7.1	5	35.00	60.00	29.00	M16	2.7	55.70	69.00	25.0	FFQ4 SOMT 090412T	2.0	40	1	0.16
FFQ4 D040-05-M16-09	25.70	40.00	1.20	7.1	5	35.00	60.00	29.00	M16	2.0	65.70	79.00	25.0	FFQ4 SOMT 090412T	2.0	40	1	0.18

- To generate a straight surface without cusps, the width of cut must not exceed DC
- Radius for programming: for insert SOMT 2.5 mm, for insert SOMW 3 mm
- When mounting insert SOMW, APMX=1.0 mm
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 50%

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Maximum plunging width

⁽³⁾ Number of inserts (or edges for solid tool)

⁽⁴⁾ Maximum ramping angle

⁽⁵⁾ Machinable diameter minimum for interpolation

⁽⁶⁾ Machinable diameter maximum for interpolation

⁽⁷⁾ Torque key size

⁽⁸⁾ Master insert identification

⁽⁹⁾ Recommended tightening torque (Nm) for insert screw

⁽¹⁰⁾ Tool tightening torque Nxmm

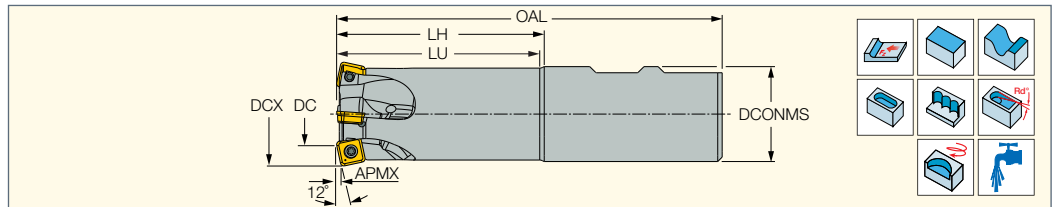
⁽¹¹⁾ 0 - Without coolant supply, 1 - With coolant supply

Spare Parts

Designation		
FFQ4 D-M-09	SR M3X0.5-L7.4 IP9	IP-9/151

FFQ4 D-W-09

Fast Feed Endmills Carrying
Single-Sided Square Inserts
with 4 Cutting Edges



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	LU	LH	DCONMS	OAL	Shank	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	MIID ⁽⁷⁾	CSP ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	kg
FFQ4 D022-2-044-W20-09	22.00	7.70	1.20	7.1	2	40.54	44.0	20.00	94.00	W	8.2	29.70	43.00	FFQ4 SOMT 090412T	1	2.0	0.19
FFQ4 D025-3-050-W25-09	25.00	10.70	1.20	7.1	3	45.19	50.0	25.00	110.00	W	5.5	35.70	49.00	FFQ4 SOMT 090412T	1	2.0	0.25
FFQ4 D032-4-064-W25-09	32.00	17.70	1.20	7.1	4	62.25	64.0	25.00	120.00	W	3.2	49.70	63.00	FFQ4 SOMT 090412T	1	2.0	0.50
FFQ4 D035-5-070-W32-09	35.00	20.70	1.20	7.1	5	65.67	70.0	32.00	130.00	W	2.7	55.70	69.00	FFQ4 SOMT 090412T	1	2.0	0.70

- To generate a straight surface without cusps, the width of cut must not exceed DC
- When mounting insert SOMW, APMX=1.0 mm
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 50%
- Radius for programming: for insert SOMT 2.5 mm, for insert SOMW 3 mm

(1) Cutting diameter maximum

(2) Maximum plunging width

(3) Number of inserts (or edges for solid tool)

(4) Maximum ramping angle

(5) Machinable diameter minimum for interpolation

(6) Machinable diameter maximum for interpolation

(7) Master insert identification

(8) 0 - Without coolant supply, 1 - With coolant supply

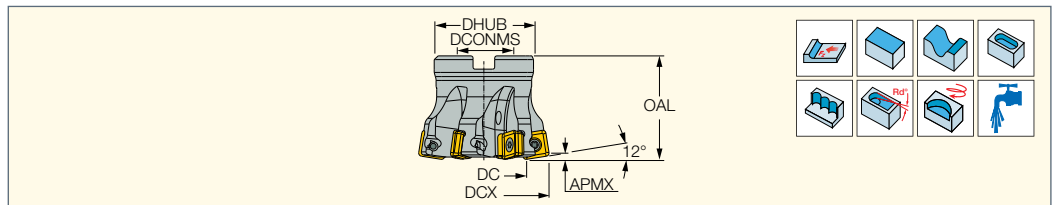
(9) Recommended tightening torque (Nm) for insert screw

Spare Parts

Designation		
FFQ4 D-W-09	SR M3X0.5-L7.4 IP9	IP-9/151

FFQ4 D-09

Fast Feed Face Mills Carrying
Single-Sided Square Inserts
with 4 Cutting Edges



Designation	DC	DCX ⁽¹⁾	APMX	AE ⁽²⁾	CICT ⁽³⁾	OAL	DCONMS	DHUB	RMPX ⁽⁴⁾	CSP ⁽⁵⁾	MDN ⁽⁶⁾	MDX ⁽⁷⁾	Arbor	kg	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾
FFQ4 D40-05-16-09	25.70	40.00	1.20	7.1	5	35.00	16.00	38.00	2.0	1	65.70	79.00	A	0.17	FFQ4 SOMT 090412T	2.0
FFQ4 D50-07-22-09	35.70	50.00	1.20	7.1	7	40.00	22.00	48.00	1.5	1	85.70	99.00	A	0.36	FFQ4 SOMT 090412T	2.0
FFQ4 D52-07-22-09	37.70	52.00	1.20	7.1	7	40.00	22.00	48.00	1.4	1	89.70	103.00	A	0.34	FFQ4 SOMT 090412T	2.0
FFQ4 D63-08-22-09	48.70	63.00	1.20	7.1	8	45.00	22.00	48.00	1.1	1	111.70	125.00	A	0.49	FFQ4 SOMT 090412T	2.0

- To generate a straight surface without cusps, the width of cut must not exceed DC
- When mounting insert SOMW, APMX=1.0 mm
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 50%
- Radius for programming: for insert SOMT 2.5 mm, for insert SOMW 3 mm

(1) Cutting diameter maximum

(2) Maximum plunging width

(3) Number of inserts (or edges for solid tool)

(4) Maximum ramping angle

(5) 0 - Without coolant supply, 1 - With coolant supply

(6) Machinable diameter minimum for interpolation

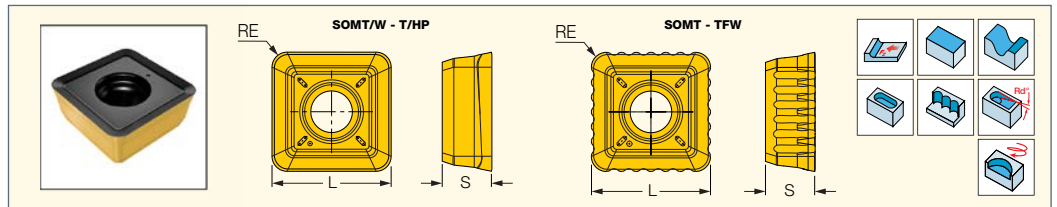
(7) Machinable diameter maximum for interpolation

(8) Master insert identification

(9) Recommended tightening torque (Nm) for insert screw

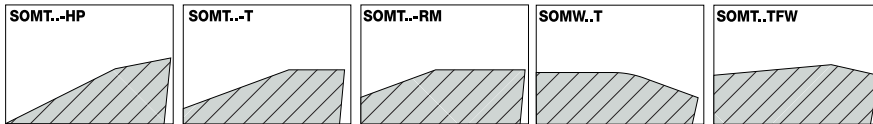
Spare Parts

Designation			
FFQ4 D40-05-16-09	SR M3X0.5-L7.4 IP9	IP-9/151	SR M8X25DIN912
FFQ4 D50-07-22-09	SR M3X0.5-L7.4 IP9	IP-9/151	SR M10X25 DIN912
FFQ4 D52-07-22-09	SR M3X0.5-L7.4 IP9	IP-9/151	SR M10X25 DIN912
FFQ4 D63-08-22-09	SR M3X0.5-L7.4 IP9	IP-9/151	SR M10X30 DIN912

FFQ4 SOMT/W 1205
 Single-Sided Square Inserts
 with 4 Cutting Edges
 for Fast Feed Milling


Designation	Dimensions			Tough ↔ Hard							Recommended Machining Data	
	L	S	RE	IC882	IC28	IC716	IC830	IC5820	IC808	IC810	a_p (mm)	f_z (mm/t)
FFQ4 SOMT 1205RM-T	12.70	5.20	1.60						•		0.50-1.50	0.40-2.00
FFQ4 SOMT 120516HP	12.70	5.20	1.60	•		•	•	•	•		0.50-1.50	0.40-1.80
FFQ4 SOMT 120516HP-P	12.70	5.20	1.60		•						0.50-1.50	0.40-1.80
FFQ4 SOMT 120516T	12.70	5.20	1.60				•		•		0.50-1.50	0.40-2.00
FFQ4 SOMT 120516TFW	12.70	5.20	1.60						•		0.50-1.50	0.20-1.20
FFQ4 SOMT 120516T20	12.70	5.20	1.60							•	0.50-1.50	0.40-2.00
FFQ4 SOMT 1205RM-HP	12.87	5.20	1.60	•			•				0.50-1.50	0.40-1.80
FFQ4 SOMW 120530T	13.00	5.30	3.00						•		0.50-1.50	0.40-0.50

- For side plunging, the initial cutting feed is 0.1 mm/t • T for steel, ferritic and martensitic stainless steel and cast iron
- RM-... for interrupted cut and machining near straight shoulder walls • HP for austenitic stainless steel and high temperature alloys • HP-P for aluminum (positive rake face)
- T20 for grey and nodular cast iron • TFW for unstable cutting conditions • SOMW flat insert for hard material (up to 60 HRC) and uneven surface
- For recommended cutting conditions for the TFW insert, please see page 25


Average Cutting Data for FFQ4 Size 12 Fast Feed Cutters

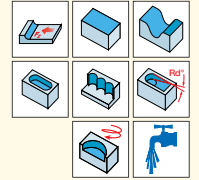
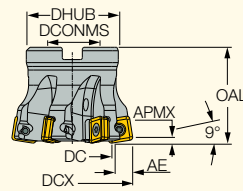
Workpiece Material						Insert type	Carbide grade	D.O.C. a _p (mm)		Cutting speed v _c (m/min)	Feed f _z (mm/tooth)		Coolant
ISO class DIN/ ISO 513	Description	Material Group No.	Hardness HB	Typical materials				Recommended	Range		Recommended	Range	
				AISI/SAE/ ASTM/AA	W.-Nr./DIN								
P	non-alloy steel and cast steel, free cutting steel	1-5	130-180	1020	1.0402	T / RM-T	IC808	1.2	0.4-1.5	150-220	1.5	0.5-2.0	dry
							IC830			140-200	1.6	0.5-2.0	dry/wet
	low alloy and cast steel (less than 5% of alloying elements)	6-8	260-300	4340	1.6582		IC808			140-200	1.5	0.5-2.0	dry
							IC830			120-180	1.6	0.5-2.0	dry/wet
		9	HRC 35-42*	3135	1.5710		IC808			130-180	1.5	0.5-1.8	dry
					IC830		120-160			1.5	0.5-1.8	dry/wet	
	high alloyed steel, cast steel and tool steel	10-11	200-220	H13	1.2344		IC808			120-170	1.3	0.5-1.8	dry
					IC830		100-150			1.4	0.5-1.8	dry/wet	
	stainless steel and cast steel	12-13	200	420	1.4021	IC808	110-160	1.3	0.5-1.8	dry			
					IC830	100-150	1.4	0.5-1.8	dry/wet				
M	stainless steel and cast steel	14	200	304L	1.4306	HP/ RM-HP	IC830	1.0	0.4-1.5	80-120	1.0	0.5-1.5	wet
							IC808			100-160		0.5-1.5	
K	gray cast iron (GG)	15-16	250	class 40	0.6025 (GG25)	T20 / T	IC5820	1.5	0.4-1.5	100-160	1.5	0.5-1.6	dry
	nodular cast iron (GGG)	17-18	200	class 65-45-12	0.7050 (GGG50)		IC882			80-130		0.5-1.8	
N	wrought and cast aluminum alloys	21-24	60-100	7075	3.4365	HP-P	IC28	1.2	0.4-1.5	150-220	1.0	0.5-2.0	wet
	hight temperature	25	130	A03930	G-AISI20MgNi					120-200		0.5-2.0	
S	high temperature alloys and titanium alloys	33-35	340	inconel 718	2.4668	HP/ RM-HP	IC830	1.0	0.4-1.5	25-30	0.5	0.5-1.0	wet
							IC808			25-35		0.5-1.0	
							IC5820			25-35		0.5-1.0	
							IC882			20-30		0.5-1.0	
		36-37	HRC 35-40	AMS R56400	3.7165 (Ti6Al4V ELI)		IC830			20-30	0.6	0.5-1.0	
							IC808			35-60		0.5-1.0	
							IC5820			25-40		0.5-1.0	
							IC716			25-35		0.5-1.0	
				IC882	25-35	0.5-1.0							
H	hardened steel	38	HRC 45-49	HARDOX 450 plate		SOMW	IC808	0.8	0.4-1.2	45-65	0.5	0.4-0.5	dry
			HRC 58-62	D2	1.2379			0.4	0.4-1.2	40-60	0.45	0.4-0.5	

* Quenched and tempered

For machining in unstable conditions, the recommended cutting data should be reduced by 20-30%

FFQ4 D-12

Fast Feed Face Mills Carrying
Single-Sided Square Inserts
with 4 Cutting Edges



Designation	DC	DCX ⁽¹⁾	APMX	AE ⁽²⁾	CICT ⁽³⁾	OAL	DHUB	DCONMS	Arbor	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	CSP ⁽⁷⁾	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	
FFQ4 D040-3-16-12	18.00	40.00	1.50	10.0	3	45.00	38.00	16.00	A	4.3	58.00	79.00	1	FFQ4 SOMT 120516HP	4.8	0.23
FFQ4 D040-4-16-12	18.00	40.00	1.50	10.0	4	45.00	38.00	16.00	A	4.3	58.00	79.00	1	FFQ4 SOMT 120516HP	4.8	0.22
FFQ4 D050-4-22-12	28.00	50.00	1.50	10.0	4	50.00	48.00	22.00	A	2.7	78.00	99.00	1	FFQ4 SOMT 120516HP	4.8	0.38
FFQ4 D050-5-22-12	28.00	50.00	1.50	10.0	5	50.00	48.00	22.00	A	2.7	78.00	99.00	1	FFQ4 SOMT 120516HP	4.8	0.37
FFQ4 D052-5-22-12	29.00	52.00	1.50	10.0	5	50.00	48.00	22.00	A	2.5	81.00	103.00	1	FFQ4 SOMT 120516HP	4.8	0.39
FFQ4 D063-6-22-12	41.00	63.00	1.50	10.0	6	50.00	48.00	22.00	A	1.8	104.00	125.00	1	FFQ4 SOMT 120516HP	4.8	0.50
FFQ4 D066-6-27-12	43.00	66.00	1.50	10.0	6	50.00	60.00	27.00	A	1.6	109.00	131.00	1	FFQ4 SOMT 120516HP	4.8	0.65
FFQ4 D080-7-27-12	58.00	80.00	1.50	10.0	7	50.00	60.00	27.00	A	1.2	138.00	159.00	1	FFQ4 SOMT 120516HP	4.8	0.84
FFQ4 D100-8-32-12	78.00	100.00	1.50	10.0	8	50.00	78.00	32.00	B	0.9	178.00	199.00	1	FFQ4 SOMT 120516HP	4.8	1.30
FFQ4 D125-10-40-12	103.00	125.00	1.50	10.0	10	63.00	92.00	40.00	B	0.7	228.00	249.00	1	FFQ4 SOMT 120516HP	4.8	2.64

- To generate a straight surface without cusps, the width of cut must not exceed DC
- When mounting insert SOMW, APMX=1.2 mm
- Radius for programming: for insert SOMT 3 mm, for insert SOMW 4 mm
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 50%

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Maximum plunging width

⁽³⁾ Number of inserts (or edges for solid tool)

⁽⁴⁾ Maximum ramping angle

⁽⁵⁾ Machinable diameter minimum for interpolation

⁽⁶⁾ Machinable diameter maximum for interpolation

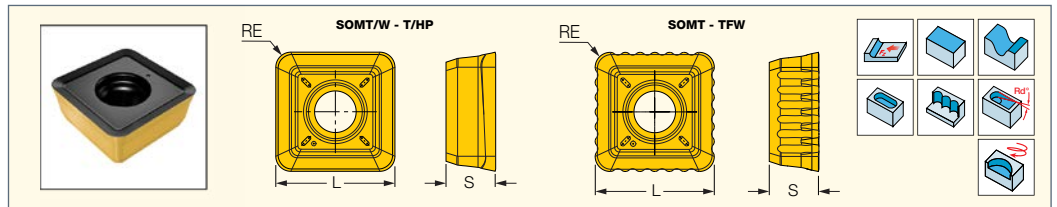
⁽⁷⁾ 0 - Without coolant supply, 1 - With coolant supply

⁽⁸⁾ Master insert identification

⁽⁹⁾ Recommended tightening torque (Nm) for insert screw

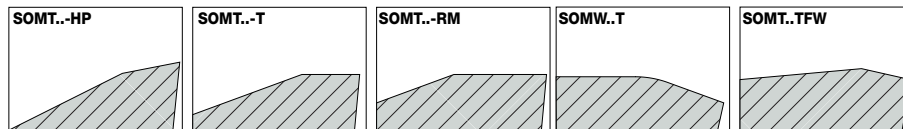
Spare Parts

Designation					
FFQ4 D040-3-16-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7		SR PS 118-0416
FFQ4 D040-4-16-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7		SR PS 118-0416
FFQ4 D050-4-22-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7	SR M10X35 DIN912	
FFQ4 D050-5-22-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7	SR M10X35 DIN912	
FFQ4 D052-5-22-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7	SR M10X35 DIN912	
FFQ4 D063-6-22-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7	SR M10X35 DIN912	
FFQ4 D066-6-27-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7	SR M12X30DIN912	
FFQ4 D080-7-27-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7	SR M12X30DIN912	
FFQ4 D100-8-32-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7		
FFQ4 D125-10-40-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7		

FFQ4 SOMT/W 1706
 Single-Sided Square Inserts
 with 4 Cutting Edges
 for Fast Feed Milling


Designation	Dimensions			Tough $\leftrightarrow$ Hard					Recommended Machining Data	
	L	S	RE	IC882	IC830	IC808	IC810	IC5600	a_p (mm)	f_z (mm/t)
FFQ4 SOMT 1706RM-HP	17.50	6.00	2.50		•				1.20-2.50	0.40-1.20
FFQ4 SOMT 1706RM-T	17.50	6.00	2.50			•			1.20-3.00	0.40-2.00
FFQ4 SOMT 170625HP	17.50	6.00	2.50	•	•	•			1.20-3.00	0.40-1.50
FFQ4 SOMT 170625T	17.50	6.00	2.50		•	•	•	•	1.20-3.00	0.40-2.00
FFQ4 SOMT 170625TFW	17.50	6.00	2.50			•			1.20-3.00	0.20-1.20
FFQ4 SOMW 170640T	18.00	6.10	4.00			•			1.20-3.00	0.40-1.00

- For side plunging, the initial cutting feed is 0.1 mm/t
- T type for steel, ferritic and martensitic stainless steel and cast iron
- RM-.. type for interrupted cut and machining near straight shoulder walls
- HP type for austenitic stainless steel and high temperature alloys
- TFW type for unstable cutting conditions
- SOMW- flat insert for hard material (up to 60 HRC) and uneven surface
- For recommended cutting conditions for the TFW insert, please see page 25


Average Cutting Data for FFQ4 Size 17 Fast Feed Cutters

Workpiece Material						Insert Type	Carbide Grade	D.O.C. a _p [mm]		Cutting Speed v _c [m/min]	Feed f _z [mm/tooth]		Coolant	
ISO Class DIN/ISO 513	Description	ISCAR Mat. Group*	Hardness, HB	Typical Representative				Recommended	Range		Recommended	Range		
				AISI/SAE/ ASTM	DIN W.-Nr.									
P	non-alloy steel and cast steel, free cutting steel	1-5	130-180	1020	1.0402	T / RM-T	IC808	2.5	0.4-3.0	150-220	1.5	0.5-2.0	dry	
							IC830			140-200	1.6	0.5-2.0	dry/wet	
	low alloy and cast steel (less than 5% of alloying elements)	6-8	260-300	4340	1.6582		IC808			140-200	1.5	0.5-2.0	dry	
							IC830			120-180	1.6	0.5-2.0	dry/wet	
		9	HRC 35-42**	3135	1.5710		IC808			130-180	1.5	0.5-1.8	dry	
							IC830			120-160	1.5	0.5-1.8	dry/wet	
	high alloyed steel, cast steel and tool steel	10-11	200-220	H13	1.2344		IC808			120-170	1.3	0.5-1.8	dry	
							IC830			100-150	1.4	0.5-1.8	dry/wet	
	stainless steel and cast steel	12-13	200	420	1.4021	IC808			110-160	1.3	0.5-1.8	dry		
						IC830			100-150	1.4	0.5-1.8	dry/wet		
M	stainless steel and cast steel	14	200	304L	1.4306	HP/ RM-HP	IC830	2.0	0.4-3.0	80-120		0.5-1.5	wet	
							IC808			100-160		0.5-1.5		
							IC5820			100-160	1.0	0.5-1.6		
							IC882			80-130		0.5-1.8		
K	gray cast iron (GG)	15-16	250	class 40	0.6025 (GG25)	T	IC810	3.0	0.4-3.0	150-220		0.5-2.0	dry	
	nodular cast iron (GGG)	17-18	200	class 65-45-12	0.7050 (GGG50)		IC810			120-200	1.5	0.5-2.0		
S	high temperature alloys and titanium alloys	33-35	340	inconel 718	2.4668	HP/ RM-HP	IC830	1.5	0.4-3.0	25-30	0.5	0.5-1.0	wet	
							IC808			25-35		0.5-1.0		
							IC5820			25-35		0.5-1.0		
							IC882			20-30		0.5-1.0		
										IC830	20-30	0.6		0.5-1.0
										IC808	35-60			0.5-1.0
										IC5820	25-40			0.5-1.0
										IC882	25-35			0.5-1.0
H	hardened steel	38	HRC 45-49	HARDOX 450 plate		SOMW	IC808	1.0	0.4-2.5	45-65	0.5	0.4-1.0	dry	
			HRC 58-62	D2	1.2379			0.5	0.4-2.5	40-60	0.4	0.4-0.5		

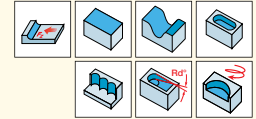
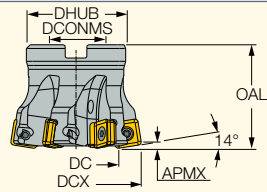
* ISCAR material group based on VDI 3323 standard

** Quenched and tempered

For machining in unstable conditions, the recommended cutting data should be reduced by 20-30%

FFQ4 D-17

Fast Feed Face Mills Carrying
Single-Sided Square Inserts
with 4 Cutting Edges



Designation	DCX ⁽¹⁾	DC	APMX	AE ⁽²⁾	CICT ⁽³⁾	OAL	DCONMS	DHUB	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	CSP ⁽⁷⁾	Arbor	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	
FFQ4 D080-06-27-17	80.00	50.80	3.00	14.6	6	50.00	27.00	60.00	1.2	130.80	159.00	1	A	FFQ4 SOMT 170625T	9.0	0.78
FFQ4 D100-07-32-17	100.00	70.80	3.00	14.6	7	63.00	32.00	78.00	0.8	170.80	199.00	1	A	FFQ4 SOMT 170625T	9.0	1.18
FFQ4 D125-08-40-17	125.00	95.80	3.00	14.6	8	63.00	40.00	92.00	0.6	220.80	249.00	1	B	FFQ4 SOMT 170625T	9.0	2.48
FFQ4 D160-10-40-17	160.00	130.80	3.00	14.6	10	63.00	40.00	95.00	0.2	290.80	319.00	0	C	FFQ4 SOMT 170625T	9.0	2.90

- To generate a straight surface without cusps, the width of cut must not exceed DC
- Radius for programming: for insert SOMT 5.5 mm, for insert SOMW 6.4 mm
- When mounting insert SOMW, APMX=2.5 mm
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 50%

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Maximum plunging width

⁽³⁾ Number of inserts (or edges for solid tool)

⁽⁴⁾ Maximum ramping angle

⁽⁵⁾ Machinable diameter minimum for interpolation

⁽⁶⁾ Machinable diameter maximum for interpolation

⁽⁷⁾ 0 - Without coolant supply, 1 - With coolant supply

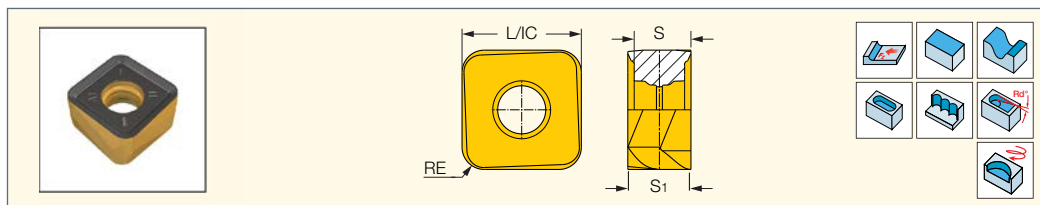
⁽⁸⁾ Master insert identification

⁽⁹⁾ Recommended tightening torque (Nm) for insert screw

Spare Parts

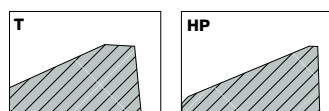
Designation				
FFQ4 D080-06-27-17	SR M5-14 IP20	SW6-T	BLD IP20/S7	SR M12X30DIN912
FFQ4 D100-07-32-17	SR M5-14 IP20	SW6-T	BLD IP20/S7	SR M16X30 DIN912
FFQ4 D125-08-40-17	SR M5-14 IP20	SW6-T	BLD IP20/S7	
FFQ4 D160-10-40-17	SR M5-14 IP20	SW6-T	BLD IP20/S7	

FFQ8 SZMU

Double-Sided Square
Inserts with 8 Cutting Edges
for High Feed Milling


Designation	Dimensions				Tough ↔ Hard				Recommended Machining Data
	L	S	S1	RE	IC882	IC830	IC808	IC810	
FFQ8 SZMU 120520HP	12.00	5.85	6.50	2.00	•	•	•	•	0.20-1.50
FFQ8 SZMU 120520T	12.00	5.85	6.50	2.00		•	•	•	0.40-1.50

• For side plunging, the initial cutting feed is 0.1 mm/t • T- for steel, ferritic and martensitic stainless steel, cast iron and hardened steel • HP - for austenitic stainless steel and high temperature alloys


Average Cutting Data for FFQ8 Fast Feed Cutters

Workpiece material						Insert type	Carbide grade	Cutting speed v _c (m/min)	Fast feed (FF)		Moderate feed (MF)		Coolant
ISO class DIN/ ISO 513	Description	ISCAR mat. group*	Hardness HB	Typical representative					D.O.C a _p (mm)	Feed f _z (mm/tooth)	D.O.C a _p (mm)	Feed f _z (mm/tooth)	
				AISI/SAE/ ASTM	DIN W.-Nr.								
P	non-alloy steel	1-5	130-180	1020	1.0402	T	IC808	150-220	0.5-1.5	0.40-1.5	0.5-3.0	0.20-1.0	dry
	low alloy steel	6-8	260-300	4340	1.6582		IC830	140-200		0.40-1.5		0.20-1.0	dry/wet
							IC808	140-200		0.40-1.5		0.20-1.0	dry/wet
		9	35-42** HRC	3135	1.5710		IC830	120-180		0.40-1.5		0.20-1.0	dry/wet
							IC808	130-180		0.40-1.5		0.20-1.0	dry
	high alloy steel	10-11	200-220	H13	1.2344		IC830	120-160		0.40-1.5		0.20-1.0	dry/wet
							IC808	120-170		0.40-1.5		0.20-1.0	dry
		ferritic/martensitic stainless steel	12-13	200	420		1.4021	IC830		100-150		0.40-1.5	0.20-1.0
IC808						110-160		0.40-1.5	0.20-1.0	dry			
M	austenitic stainless steel	14	200	304L	1.4306	HP	IC882	70-130	0.5-1.5	0.20-0.8	0.5-3.0	0.20-0.5	wet
							IC808	100-160		0.20-0.8		0.20-0.5	
							IC830	80-140		0.20-0.8		0.20-0.5	
K	gray cast iron	15-16	250	class 40	0.6025 (GG25)	T	IC810	150-220	0.5-1.5	0.40-1.5	0.5-3.0	0.40-1.0	dry
	nodular cast iron	17-18	200	class 65-45-12	0.7050 (GGG50)		IC810	120-200		0.40-1.5		0.40-1.0	
S	high temperature alloys and titanium alloys	31-32	220	330	1.4864	HP	IC882	40-60	0.5-1.5	0.20-0.8	0.5-3.0	0.20-0.5	wet
		33-35	340	inconel 718	2.4668		IC808	40-80		0.20-0.8		0.20-0.5	
							IC830	40-75		0.20-0.8		0.20-0.5	
							IC882	20-30		0.20-0.8		0.20-0.5	
							IC808	25-40		0.20-0.8		0.20-0.5	
							IC830	25-35		0.20-0.8		0.20-0.5	
							IC882	30-50		0.20-0.8		0.20-0.5	
		36-37	30-32 HRC	AMS R56400	3.7165		IC808	40-60		0.20-0.8		0.20-0.5	
IC830	35-55					0.20-0.8	0.20-0.5						
H	hardened steel	38	45-49 HRC	HARDOX 450 plate		T	IC808	50-75	0.5-1.5	0.20-0.5	0.5-3.0	0.20-0.5	dry

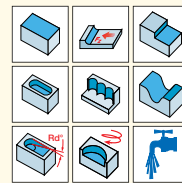
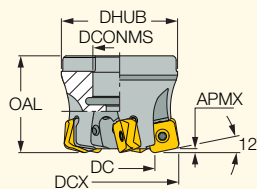
* ISCAR material group based on VDI 3323 standard

** Quenched and tempered

For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

FFQ8-12

Fast Feed Face Mills Carrying
Double-Sided Square Inserts
with 8 Cutting Edges



Designation	DC	DCX ⁽¹⁾	APMX	CICT ⁽²⁾	OAL	DHUB	DCONMS	Arbor	RMPX ⁽³⁾	MDN ⁽⁴⁾	MDX ⁽⁵⁾	CSP ⁽⁶⁾	TQ (Nm) ⁽⁷⁾	MIID ⁽⁸⁾	kg
FFQ8 D050-05-22-12	30.60	50.00	1.50	5	40.00	48.00	22.00	A	0.3	80.60	99.00	1	4.8	FFQ8 SZMU 120520	0.46
FFQ8 D063-06-22-12	43.60	63.00	1.50	6	40.00	48.00	22.00	A	0.2	106.60	125.00	1	4.8	FFQ8 SZMU 120520	0.60
FFQ8 D066-06-27-12	46.60	66.00	1.50	6	50.00	60.00	27.00	A	0.2	112.60	131.00	1	4.8	FFQ8 SZMU 120520	0.83
FFQ8 D080-07-27-12	60.60	80.00	1.50	7	50.00	60.00	27.00	A	0.2	140.60	159.00	1	4.8	FFQ8 SZMU 120520	1.98
FFQ8 D100-08-32-12	80.60	100.00	1.50	8	50.00	78.00	32.00	B	0.1	180.60	199.00	1	4.8	FFQ8 SZMU 120520	3.03

- Radius for programming 3.6 mm • To generate a straight surface without cusps, the width of cut must not exceed DC
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 30%.

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

(3) Maximum ramping angle

(4) Machinable diameter minimum for interpolation

(5) Machinable diameter maximum for interpolation

(6) 0 - Without coolant supply, 1 - With coolant supply

(7) Recommended tightening torque (Nm) for insert screw

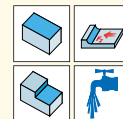
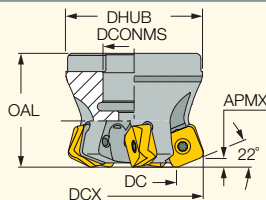
(8) Master insert identification

Spare Parts

Designation				
FFQ8 D050-05-22-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M10X25 DIN912
FFQ8 D063-06-22-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M10X25 DIN912
FFQ8 D066-06-27-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M12X30DIN912
FFQ8 D080-07-27-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M12X30DIN912
FFQ8 D100-08-32-12	SR M4X0.7-L11.5 IP15	BLD IP15/M7	SW6-T-SH	

MFQ8-12

Moderate Feed Face Mills
Carrying Double-Sided Square
Inserts with 8 Cutting Edges



Designation	DC	DCX ⁽¹⁾	APMX	CICT ⁽²⁾	OAL	DHUB	DCONMS	Arbor	CSP ⁽³⁾	TQ (Nm) ⁽⁴⁾	MIID ⁽⁵⁾	kg
MFQ8 D050-05-22-12	31.60	50.00	3.00	5	40.00	48.00	22.00	A	1	4.8	FFQ8 SZMU 120520	0.44
MFQ8 D063-06-22-12	44.60	63.00	3.00	6	40.00	48.00	22.00	A	1	4.8	FFQ8 SZMU 120520	0.84
MFQ8 D080-07-27-12	61.60	80.00	3.00	7	50.00	60.00	27.00	A	1	4.8	FFQ8 SZMU 120520	1.84
MFQ8 D100-08-32-12	81.60	100.00	3.00	8	50.00	78.00	32.00	B	1	4.8	FFQ8 SZMU 120520	2.95

- Radius for programming 5.0 mm • To generate a straight surface without cusps, the width of cut must not exceed DC
- For slot milling or machining with high tool overhang, the maximum depth of cut should be reduced by 30%.

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

(3) 0 - Without coolant supply, 1 - With coolant supply

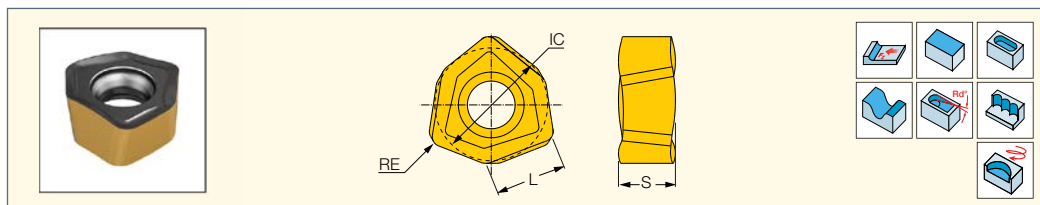
(4) Recommended tightening torque (Nm) for insert screw

(5) Master insert identification

Spare Parts

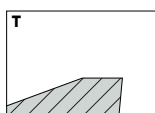
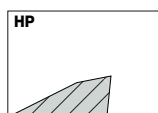
Designation				
MFQ8 D050-05-22-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M10X40-1638
MFQ8 D063-06-22-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M10X25 DIN912
MFQ8 D080-07-27-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M12X30DIN912
MFQ8 D100-08-32-12	SR M4X0.7-L11.5 IP15	BLD IP15/M7	SW6-T-SH	

H600 WXCU

Double-Sided Inserts
with 6 Cutting Edges for
Fast Feed Machining


Designation	Dimensions				Tough ↔ Hard							
	IC	L	S	RE	IC882	IC330	IC830	IC5820	IC380	IC808	IC810	IC5600
H600 WXCU 040310HP	6.25	4.13	3.10	0.96	•	•	•					
H600 WXCU 040310T	6.25	4.13	3.10	0.96			•			•		•
H600 WXCU 05T312HP	8.33	5.50	4.20	1.20	•	•	•	•				
H600 WXCU 05T312T	8.33	5.50	4.20	1.20			•			•	•	
H600 WXCU 070515HP	11.14	7.16	5.90	1.50	•	•	•	•	•			
H600 WXCU 070515T	11.14	7.16	5.90	1.50			•			•	•	•
H600 WXCU 080612HP	13.65	8.80	6.80	1.20	•	•	•		•	•		
H600 WXCU 080612T	13.65	8.80	6.80	1.20			•			•	•	
H600 WXCU 080616RM	13.65	8.80	6.80	1.60			•			•		

• HP - for stainless steel and high temperature alloys • T - for alloy steel and cast iron ("I" mark on top rake face for identification) • RM - for interrupted cut and hard materials



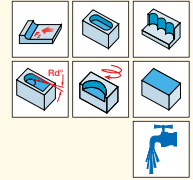
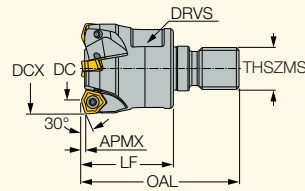
Inserts	Cutting Recommendations for FF Tools		Radius for Programming on FF Tools	Cutting Recommendations for MF Tools		Radius for Programming on MF Tools
	a_p (mm)	f_z (mm/t)		a_p (mm)	f_z (mm/t)	
H600 WXCU 040310HP	0.5-0.8	0.34-0.68	1.9	0.5-1.5	0.2-0.4	2.6
H600 WXCU 040310T	0.5-0.8	0.68-1.03	1.9	0.5-1.5	0.4-0.6	2.6
H600 WXCU 05T312HP	0.7-1.0	0.34-0.68	2.3	0.8-2.0	0.2-0.4	3.3
H600 WXCU 05T312T	0.7-1.0	0.68-1.03	2.3	0.8-2.0	0.4-0.6	3.3
H600 WXCU 070515HP	1.0-1.5	0.34-0.86	3.1	1-2.7	0.2-0.5	4.1
H600 WXCU 070515T	1.0-1.5	0.68-1.37	3.1	1-2.7	0.4-0.8	4.1
H600 WXCU 080612HP	1.5-2.0	0.34-0.86	3.3	1.8-3.5	0.2-0.5	4.8
H600 WXCU 080612T	1.5-2.0	0.68-1.37	3.3	1.8-3.5	0.4-0.8	4.8
H600 WXCU 080616RM	1.5-2.0	0.68-1.37	3.7	1.8-3.5	0.4-0.8	5.2



Inserts	Cutting Recommendations for FF Tools in plunging		Radius for Programming on FF Tools	Cutting Recommendations for MF Tools in plunging		Radius for Programming on MF Tools
	a_e (mm)	f_z (mm/t)		a_e (mm)	f_z (mm/t)	
H600 WXCU 040310HP	3.7	0.04-0.08	1.9	3.5	0.04-0.08	2.6
H600 WXCU 040310T	3.7	0.04-0.10	1.9	3.5	0.04-0.10	2.6
H600 WXCU 05T312HP	5	0.04-0.08	2.3	4.75	0.04-0.08	3.3
H600 WXCU 05T312T	5	0.04-0.10	2.3	4.75	0.04-0.10	3.3
H600 WXCU 070515HP	6.5	0.04-0.10	3.1	6.15	0.04-0.10	4.1
H600 WXCU 070515T	6.5	0.04-0.12	3.1	6.15	0.04-0.12	4.1
H600 WXCU 080612HP	8	0.04-0.10	3.3	7.65	0.04-0.10	4.8
H600 WXCU 080612T	8	0.04-0.12	3.3	7.65	0.04-0.12	4.8
H600 WXCU 080616RM	8	0.04-0.12	3.7	7.65	0.04-0.12	5.2

MF EWX-M

Moderate Feed Endmills with
FLEX-FIT Threaded Connection
Carrying Double-Sided Inserts
with 6 Cutting Edges



Designation	DCX ⁽¹⁾	DC	APMX	CICT ⁽²⁾	LF	OAL	THSZMS	DRVS ⁽³⁾	RMPX ⁽⁴⁾	CSP ⁽⁵⁾	MDN ⁽⁶⁾	MDX ⁽⁷⁾	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	TQ_3 ⁽¹⁰⁾	kg
MF EWX D20-3-M10-04	20.00	13.00	1.50	3	28.00	48.00	M10	14.0	2.4	1	33.00	39.00	H600 WXCUC 040310T	0.9	29	0.05
MF EWX D25-4-M12-04	25.00	18.00	1.50	4	32.00	54.00	M12	17.0	1.7	1	43.00	49.00	H600 WXCUC 040310T	0.9	33	0.09
MF EWX D25-3-M12-05	25.00	15.50	2.00	3	30.00	52.00	M12	17.0	3.0	1	40.50	49.00	H600 WXCUC 05T312T	2.0	33	0.07
MF EWX D32-4-M16-05	32.00	22.50	2.00	4	35.00	60.00	M16	24.0	1.9	1	54.50	63.00	H600 WXCUC 05T312T	2.0	40	0.16
MF EWX D32-3-M16-07	32.00	19.70	2.70	3	35.00	60.00	M16	24.0	3.0	1	51.70	63.00	H600 WXCUC 070515HP	4.8	40	0.15

• Before mounting the FLEX-FIT adaptation, clean the mating surfaces and threads. Tighten to eliminate gaps, using the torque value from TQ_3.

• To generate a straight surface without cusps, the width of cut must not exceed DC

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

(3) Clamping wrench size

(4) Maximum ramping angle

(5) 0 - Without coolant supply, 1 - With coolant supply

(6) Machinable diameter minimum for interpolation

(7) Machinable diameter maximum for interpolation

(8) Master insert identification

(9) Recommended tightening torque (Nm) for insert screw

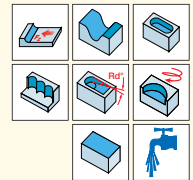
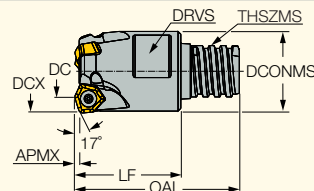
(10) Tool tightening torque Nxmm

Spare Parts

Designation				
MF EWX D20-3-M10-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D25-4-M12-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D25-3-M12-05	SR 10508600	T-9/51		
MF EWX D32-4-M16-05	SR 10508600	T-9/51		
MF EWX D32-3-M16-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH

FF EWX-MM

Fast Feed Endmills with
MULTI-MASTER Threaded
Connection That Mount
Double-Sided Inserts
with 6 Cutting Edges



Designation	DCX ⁽¹⁾	DC	APMX	CICT ⁽²⁾	THSZMS	LF	OAL	DCONMS	DRVS ⁽³⁾	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	CSP ⁽⁷⁾	MIID ⁽⁸⁾	kg
FF EWX D16-2-MMT10-04	16.00	8.60	0.80	2	T10	19.50	30.81	15.20	12.0	5.0	24.60	31.00	1	H600 WXCUC 040310HP	0.02
FF EWX D20-3-MMT12-04	20.00	12.60	0.80	3	T12	25.00	38.80	18.80	15.0	4.8	32.60	39.00	1	H600 WXCUC 040310HP	0.05
FF EWX D25-4-MMT15-04	25.00	17.60	0.80	4	T15	30.00	47.00	23.90	19.0	3.3	42.60	49.00	1	H600 WXCUC 040310HP	0.10
FF EWX D25-3-MMT15-05	25.00	15.00	1.00	3	T15	30.00	47.00	23.90	19.0	5.0	40.00	49.00	1	H600 WXCUC 05T312T	0.09

• Do not apply lubricant to the MULTI-MASTER threaded connection • To generate a straight surface without cusps, the width of cut must not exceed DC

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

(3) Width across flats (wrench should be ordered separately)

(4) Maximum ramping angle

(5) Machinable diameter minimum for interpolation

(6) Machinable diameter maximum for interpolation

(7) 0 - Without coolant supply, 1 - With coolant supply

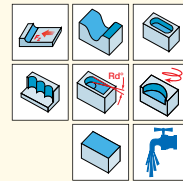
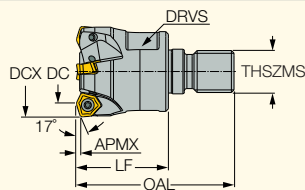
(8) Master insert identification

Spare Parts

Designation		
FF EWX D16-2-MMT10-04	SR M2.5X6-T7-60	T-7/51
FF EWX D20-3-MMT12-04	SR M2.5X6-T7-60	T-7/51
FF EWX D25-4-MMT15-04	SR M2.5X6-T7-60	T-7/51
FF EWX D25-3-MMT15-05	SR 10508600	T-9/51

FF EWX-M

Fast Feed Endmills with FLEX-FIT
Threaded Connection
Carrying Double-Sided Inserts
with 6 Cutting Edges



Designation	DCX ⁽¹⁾	DC	APMX	CICT ⁽²⁾	LF	OAL	THSZMS	RMPX ⁽³⁾	CSP ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	DRVS ⁽⁷⁾	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	TQ_3 ⁽¹⁰⁾	
FF EWX D20-3-M10-04	20.00	12.60	0.80	3	25.00	45.00	M10	4.8	1	32.60	39.00	15.0	H600 WXCJ 040310HP	0.9	29	0.05
FF EWX D25-4-M12-04	25.00	17.60	0.80	4	30.00	52.00	M12	3.3	1	42.60	49.00	19.0	H600 WXCJ 040310HP	0.9	33	0.09
FF EWX D25-3-M12-05	25.00	15.00	1.00	3	30.00	52.00	M12	5.0	1	40.00	49.00	19.0	H600 WXCJ 05T312T	2.0	33	0.09
FF EWX D32-4-M16-05	32.00	22.00	1.00	4	35.00	60.00	M16	4.0	1	54.00	63.00	25.0	H600 WXCJ 05T312T	2.0	40	0.17
FF EWX D35-4-M16-05	35.00	25.00	1.00	4	35.00	60.00	M16	3.5	1	60.00	69.00	25.0	H600 WXCJ 05T312T	2.0	40	0.19
FF EWX D40-5-M16-05	40.00	30.00	1.00	5	40.00	65.00	M16	2.8	1	70.00	79.00	25.0	H600 WXCJ 05T312T	2.0	40	0.26
FF EWX D32-3-M16-07	32.00	19.00	1.50	3	35.00	60.00	M16	6.3	1	51.00	63.00	25.0	H600 WXCJ 070515HP	4.8	40	0.16
FF EWX D40-4-M16-07	40.00	27.00	1.50	4	40.00	65.00	M16	4.2	1	67.00	79.00	25.0	H600 WXCJ 070515HP	4.8	40	0.24

• Before mounting the FLEX-FIT adaptation, clean the mating surfaces and threads. Tighten to eliminate gaps, using the torque value from TQ_3.

• To generate a straight surface without cusps, the width of cut must not exceed DC

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

(3) Maximum ramping angle

(4) 0 - Without coolant supply, 1 - With coolant supply

(5) Machinable diameter minimum for interpolation

(6) Machinable diameter maximum for interpolation

(7) Clamping wrench size

(8) Master insert identification

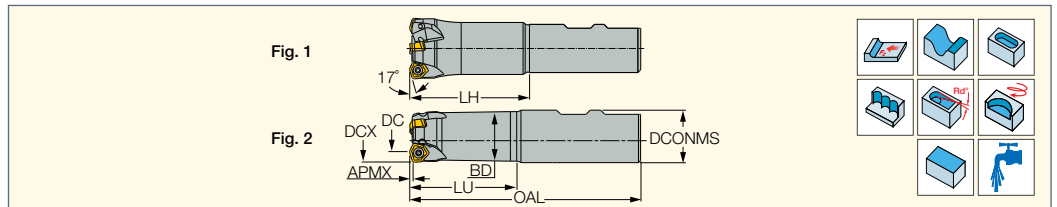
(9) Recommended tightening torque (Nm) for insert screw

(10) Tool tightening torque Nxmm

Spare Parts

Designation				
FF EWX D20-3-M10-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D25-4-M12-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D25-3-M12-05	SR 10508600	T-9/51		
FF EWX D32-4-M16-05	SR 10508600	T-9/51		
FF EWX D35-4-M16-05	SR 10508600	T-9/51		
FF EWX D40-5-M16-05	SR 10508600	T-9/51		
FF EWX D32-3-M16-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
FF EWX D40-4-M16-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH

FF EWX

 Fast Feed Endmills Carrying
 Double-Sided Inserts
 with 6 Cutting Edges


Designation	DCX ⁽¹⁾	DC	APMX	CICT ⁽²⁾	BD	LU	LH	OAL	DCONMS	Shank ⁽³⁾	RMPX ⁽⁴⁾	CSP ⁽⁵⁾	MDN ⁽⁶⁾	MDX ⁽⁷⁾	Fig.	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	kg
FF EWX D16-2-030-C16-04	16.00	8.60	0.80	2	14.90	30.0	-	113.00	16.00	C	5.0	1	24.60	31.00	2	H600 WXCUC 040310T	0.9	0.15
FF EWX D16-2-030-W16-04	16.00	8.60	0.80	2	14.90	30.0	-	81.00	16.00	W	5.0	1	24.60	31.00	2	H600 WXCUC 040310T	0.9	0.10
FF EWX D16-2-050-W20-04	16.00	8.60	0.80	2	14.90	50.0	-	109.00	20.00	W	5.0	1	24.60	31.00	2	H600 WXCUC 040310T	0.9	0.19
FF EWX D16-2-070-C20-04	16.00	8.60	0.80	2	14.90	70.0	-	159.00	20.00	C	5.0	1	24.60	31.00	2	H600 WXCUC 040310T	0.9	0.28
FF EWX D16-2-080-W20-04	16.00	8.60	0.80	2	14.90	80.0	-	139.00	20.00	W	5.0	1	24.60	31.00	2	H600 WXCUC 040310T	0.9	0.22
FF EWX D20-3-040-W20-04	20.00	12.60	0.80	3	18.90	40.0	-	93.00	20.00	W	4.8	1	32.60	39.00	2	H600 WXCUC 040310T	0.9	0.19
FF EWX D20-3-050-C20-04	20.00	12.60	0.80	3	18.90	50.0	-	133.00	20.00	C	4.8	1	32.60	39.00	2	H600 WXCUC 040310T	0.9	0.28
FF EWX D20-3-060-W20-04	20.00	12.60	0.80	3	18.90	60.0	-	113.00	20.00	W	4.8	1	32.60	39.00	2	H600 WXCUC 040310T	0.9	0.23
FF EWX D20-3-100-C20-04	20.00	12.60	0.80	3	18.90	100.0	-	183.00	20.00	C	4.8	1	32.60	39.00	2	H600 WXCUC 040310T	0.9	0.38
FF EWX D20-3-100-W20-04	20.00	12.60	0.80	3	18.90	100.0	-	153.00	20.00	W	4.8	1	32.60	39.00	2	H600 WXCUC 040310T	0.9	0.31
FF EWX D25-3-050-W25-05	25.00	15.00	1.00	3	23.60	50.0	53.0	110.00	25.00	W	5.0	1	40.00	49.00	2	H600 WXCUC 05T312T	2.0	0.34
FF EWX D25-3-060-C25-05	25.00	15.00	1.00	3	23.60	60.0	63.0	145.00	25.00	C	5.0	1	40.00	49.00	2	H600 WXCUC 05T312T	2.0	0.47
FF EWX D25-3-080-W25-05	25.00	15.00	1.00	3	23.60	80.0	83.0	140.00	25.00	W	5.0	1	40.00	49.00	2	H600 WXCUC 05T312T	2.0	0.44
FF EWX D25-3-120-C25-05	25.00	15.00	1.00	3	23.60	120.0	123.0	205.00	25.00	C	5.0	1	40.00	49.00	2	H600 WXCUC 05T312T	2.0	0.66
FF EWX D25-3-120-W25-05	25.00	15.00	1.00	3	23.60	120.0	123.0	180.00	25.00	W	5.0	1	40.00	49.00	2	H600 WXCUC 05T312T	2.0	0.56
FF EWX D32-4-040-C25-05	32.00	22.00	1.00	4	27.00	-	40.0	180.00	25.00	C	4.0	1	54.00	63.00	1	H600 WXCUC 05T312T	2.0	0.63
FF EWX D32-4-060-W25-05	32.00	22.00	1.00	4	27.00	60.0	63.0	120.00	25.00	W	4.0	1	54.00	63.00	1	H600 WXCUC 05T312T	2.0	0.43
FF EWX D32-4-060-W32-05	32.00	22.00	1.00	4	27.00	-	63.0	125.00	32.00	W	4.0	1	54.00	63.00	2	H600 WXCUC 05T312T	2.0	0.64
FF EWX D32-4-070-C32-05	32.00	22.00	1.00	4	30.60	70.0	73.0	155.00	32.00	C	4.0	1	54.00	63.00	2	H600 WXCUC 05T312T	2.0	0.81
FF EWX D32-4-100-W25-05	32.00	22.00	1.00	4	27.00	-	100.0	160.00	25.00	W	4.0	1	54.00	63.00	1	H600 WXCUC 05T312T	2.0	0.60
FF EWX D32-4-100-W32-05	32.00	22.00	1.00	4	30.60	100.0	103.0	165.00	32.00	W	4.0	1	54.00	63.00	2	H600 WXCUC 05T312T	2.0	0.84
FF EWX D32-4-120-C32-05	32.00	22.00	1.00	4	30.60	120.0	123.0	205.00	32.00	C	4.0	1	54.00	63.00	2	H600 WXCUC 05T312T	2.0	1.06
FF EWX D32-4-150-W32-05	32.00	22.00	1.00	4	30.60	150.0	153.0	215.00	32.00	W	4.0	1	54.00	63.00	2	H600 WXCUC 05T312T	2.0	1.08
FF EWX D40-5-L50-C32-05	40.00	30.00	1.00	5	34.00	-	50.0	250.00	32.00	C	2.8	1	70.00	79.00	1	H600 WXCUC 05T312T	2.0	1.40
FF EWX D40-5-S50-C32-05	40.00	30.00	1.00	5	34.00	-	50.0	150.00	32.00	C	2.8	1	70.00	79.00	1	H600 WXCUC 05T312T	2.0	0.85
FF EWX D40-5-060-W32-05	40.00	30.00	1.00	5	34.00	-	60.0	125.00	32.00	W	2.8	1	70.00	79.00	1	H600 WXCUC 05T312T	2.0	0.72
FF EWX D40-5-200-W40-05	40.00	30.00	1.00	5	38.60	200.0	203.0	275.00	40.00	W	2.8	1	70.00	79.00	2	H600 WXCUC 05T312T	2.0	2.08
FF EWX D32-3-060-W32-07	32.00	19.00	1.50	3	30.70	60.0	63.0	125.00	32.00	W	6.3	1	51.00	63.00	2	H600 WXCUC 070515T	4.8	0.60
FF EWX D32-3-070-C32-07	32.00	19.00	1.50	3	30.70	70.0	73.0	155.00	32.00	C	6.3	1	51.00	63.00	2	H600 WXCUC 070515T	4.8	0.76
FF EWX D32-3-100-W32-07	32.00	19.00	1.50	3	30.70	100.0	103.0	165.00	32.00	W	6.3	1	51.00	63.00	2	H600 WXCUC 070515T	4.8	0.78
FF EWX D32-3-120-C32-07	32.00	19.00	1.50	3	30.70	120.0	123.0	205.00	32.00	C	6.3	1	51.00	63.00	2	H600 WXCUC 070515T	4.8	0.99
FF EWX D40-4-S50-C32-07	40.00	27.00	1.50	4	-	50.0	52.2	150.00	32.00	C	4.2	1	77.00	79.00	1	H600 WXCUC 070515T	4.8	0.84

• To generate a straight surface without cusps, the width of cut must not exceed DC

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

(3) C-Cylindrical, W-Weldon

(4) Maximum ramping angle

(5) 0 - Without coolant supply, 1 - With coolant supply

(6) Machinable diameter minimum for interpolation

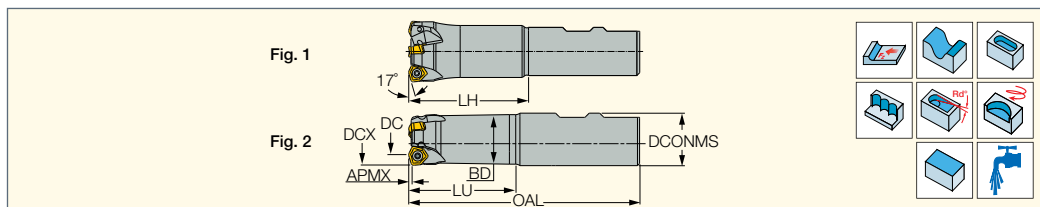
(7) Machinable diameter maximum for interpolation

(8) Master insert identification

(9) Recommended tightening torque (Nm) for insert screw

FF EWX

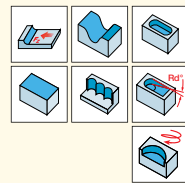
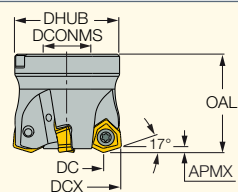
Fast Feed Endmills Carrying
Double-Sided Inserts
with 6 Cutting Edges

**Spare Parts**

Designation				
FF EWX D16-2-030-C16-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D16-2-030-W16-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D16-2-050-W20-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D16-2-070-C20-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D16-2-080-W20-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D20-3-040-W20-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D20-3-050-C20-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D20-3-060-W20-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D20-3-100-C20-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D20-3-100-W20-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D25-3-050-W25-05	SR 10508600	T-9/51		
FF EWX D25-3-060-C25-05	SR 10508600	T-9/51		
FF EWX D25-3-080-W25-05	SR 10508600	T-9/51		
FF EWX D25-3-120-C25-05	SR 10508600	T-9/51		
FF EWX D25-3-120-W25-05	SR 10508600	T-9/51		
FF EWX D32-4-040-C25-05	SR 10508600	T-9/51		
FF EWX D32-4-060-W25-05	SR 10508600	T-9/51		
FF EWX D32-4-060-W32-05	SR 10508600	T-9/51		
FF EWX D32-4-070-C32-05	SR 10508600	T-9/51		
FF EWX D32-4-100-W25-05	SR 10508600	T-9/51		
FF EWX D32-4-100-W32-05	SR 10508600	T-9/51		
FF EWX D32-4-120-C32-05	SR 10508600	T-9/51		
FF EWX D32-4-150-W32-05	SR 10508600	T-9/51		
FF EWX D40-5-L50-C32-05	SR 10508600	T-9/51		
FF EWX D40-5-S50-C32-05	SR 10508600	T-9/51		
FF EWX D40-5-060-W32-05	SR 10508600	T-9/51		
FF EWX D40-5-200-W40-05	SR 10508600	T-9/51		
FF EWX D32-3-060-W32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
FF EWX D32-3-070-C32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
FF EWX D32-3-100-W32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
FF EWX D32-3-120-C32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
FF EWX D40-4-S50-C32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH

FF FWX

Fast Feed Face Mills Carrying
Double-Sided Inserts
with 6 Cutting Edges



Designation	DC	DCX ⁽¹⁾	APMX	CICT ⁽²⁾	OAL	DHUB	DCONMS	Arbor	RMPX ⁽³⁾	MDN ⁽⁴⁾	MDX ⁽⁵⁾	CSP ⁽⁶⁾	MIID ⁽⁷⁾	TQ (Nm) ⁽⁸⁾	
FF FWX D040-05-16-05	30.10	40.00	1.00	5	35.00	38.00	16.00	A	2.8	70.10	79.00	1	H600 WXCJ 05T312T	2.0	0.20
FF FWX D050-06-22-05	40.10	50.00	1.00	6	40.00	48.00	22.00	A	2.0	90.10	99.00	1	H600 WXCJ 05T312T	2.0	0.36
FF FWX D052-06-22-05	42.10	52.00	1.00	6	40.00	48.00	22.00	A	1.9	94.10	103.00	1	H600 WXCJ 05T312T	2.0	0.37
FF FWX D040-04-16-07	27.00	40.00	1.50	4	35.00	38.00	16.00	A	4.2	67.00	79.00	1	H600 WXCJ 070515HP	4.8	0.18
FF FWX D050-05-22-07	37.00	50.00	1.50	5	40.00	48.00	22.00	A	2.9	87.00	99.00	1	H600 WXCJ 070515HP	4.8	0.33
FF FWX D052-05-22-07	39.00	52.00	1.50	5	40.00	48.00	22.00	A	2.8	91.00	103.00	1	H600 WXCJ 070515HP	4.8	0.33
FF FWX D063-06-22-07	50.00	63.00	1.50	6	40.00	61.00	22.00	A	2.1	113.00	125.00	1	H600 WXCJ 070515HP	4.8	0.58
FF FWX D080-07-32-07	67.00	80.00	1.50	7	55.00	76.00	32.00	A	1.6	147.00	159.00	1	H600 WXCJ 070515HP	4.8	1.38
FF FWX D100-08-32-07	87.00	100.00	1.50	8	50.00	78.00	32.00	B	1.2	187.00	199.00	1	H600 WXCJ 070515HP	4.8	1.47
FF FWX D050-04-22-08	34.00	50.00	2.00	4	45.00	48.00	22.00	A	4.8	84.00	99.00	1	H600 WXCJ 080612T	9.0	0.34
FF FWX D052-04-22-08	36.00	52.00	2.00	4	45.00	48.00	22.00	A	4.5	88.00	103.00	1	H600 WXCJ 080612T	9.0	0.37
FF FWX D063-05-22-08	47.00	63.00	2.00	5	45.00	61.00	22.00	A	3.3	110.00	125.00	1	H600 WXCJ 080612T	9.0	0.61
FF FWX D063-05-27-08	47.00	63.00	2.00	5	50.00	61.00	27.00	A	3.3	110.00	125.00	1	H600 WXCJ 080612T	9.0	0.65
FF FWX D066-05-22-08	50.00	66.00	2.00	5	45.00	61.00	22.00	A	3.1	116.00	131.00	1	H600 WXCJ 080612T	9.0	0.68
FF FWX D066-05-27-08	50.00	66.00	2.00	5	50.00	61.00	27.00	A	3.1	116.00	131.00	1	H600 WXCJ 080612T	9.0	0.72
FF FWX D080-06-32-08	64.00	80.00	2.00	6	55.00	76.00	32.00	A	2.3	144.00	159.00	1	H600 WXCJ 080612T	9.0	1.24
FF FWX D100-07-32-08	84.00	100.00	2.00	7	50.00	78.00	32.00	B	1.7	184.00	199.00	1	H600 WXCJ 080612T	9.0	1.42
FF FWX D125-09-40-08	109.00	125.00	2.00	9	55.00	90.00	40.00	B	1.3	234.00	249.00	1	H600 WXCJ 080612T	9.0	2.37
FF FWX D160-11-40-08	144.00	160.00	2.00	11	55.00	95.00	40.00	C	1.0	304.00	319.00	0	H600 WXCJ 080612T	9.0	3.44

• To generate a straight surface without cusps, the width of cut must not exceed DC

(1) Cutting diameter maximum

(2) Number of inserts (or edges for solid tool)

(3) Maximum ramping angle

(4) Machinable diameter minimum for interpolation

(5) Machinable diameter maximum for interpolation

(6) 0 - Without coolant supply, 1 - With coolant supply

(7) Master insert identification

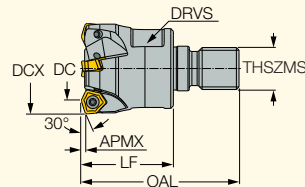
(8) Recommended tightening torque (Nm) for insert screw

Spare Parts

Designation					
FF FWX D040-05-16-05	SR 10508600	T-9/51			SR M8X25DIN912
FF FWX D050-06-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
FF FWX D052-06-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
FF FWX D040-04-16-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M8X25-D11.5
FF FWX D050-05-22-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M10X25 DIN912
FF FWX D052-05-22-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M10X25 DIN912
FF FWX D063-06-22-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M10X25 DIN912
FF FWX D080-07-32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M16X30 DIN912
FF FWX D100-08-32-07	SR 34-535-SN		BLD T15/M7	SW6-T-SH	
FF FWX D050-04-22-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M10X25 DIN912
FF FWX D052-04-22-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M10X25 DIN912
FF FWX D063-05-22-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M10X25 DIN912
FF FWX D063-05-27-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M12X30DIN912
FF FWX D066-05-22-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M10X25 DIN912
FF FWX D066-05-27-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M12X30DIN912
FF FWX D080-06-32-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M16X30 DIN912
FF FWX D100-07-32-08	SR 14-591/H		BLD T20/M7	SW6-T	
FF FWX D125-09-40-08	SR 14-591/H		BLD T20/L7	SW6-T	
FF FWX D160-11-40-08	SR 14-591/H		BLD T20/L7	SW6-T	

MF EWX-M

Moderate Feed Endmills with
FLEX-FIT Threaded Connection
Carrying Double-Sided Inserts
with 6 Cutting Edges



Designation	DCX ⁽¹⁾	DC	APMX	CICT ⁽²⁾	LF	OAL	THSZMS	DRVS ⁽³⁾	RMPX ⁽⁴⁾	CSP ⁽⁵⁾	MDN ⁽⁶⁾	MDX ⁽⁷⁾	MIID ⁽⁸⁾	TQ (Nm) ⁽⁹⁾	TQ_3 ⁽¹⁰⁾	kg
MF EWX D20-3-M10-04	20.00	13.00	1.50	3	28.00	48.00	M10	14.0	2.4	1	33.00	39.00	H600 WXCUC 040310T	0.9	29	0.05
MF EWX D25-4-M12-04	25.00	18.00	1.50	4	32.00	54.00	M12	17.0	1.7	1	43.00	49.00	H600 WXCUC 040310T	0.9	33	0.09
MF EWX D25-3-M12-05	25.00	15.50	2.00	3	30.00	52.00	M12	17.0	3.0	1	40.50	49.00	H600 WXCUC 05T312T	2.0	33	0.07
MF EWX D32-4-M16-05	32.00	22.50	2.00	4	35.00	60.00	M16	24.0	1.9	1	54.50	63.00	H600 WXCUC 05T312T	2.0	40	0.16
MF EWX D32-3-M16-07	32.00	19.70	2.70	3	35.00	60.00	M16	24.0	3.0	1	51.70	63.00	H600 WXCUC 070515HP	4.8	40	0.15

- Before mounting the FLEX-FIT adaptation, clean the mating surfaces and threads. Tighten to eliminate gaps, using the torque value from TQ_3.

- To generate a straight surface without cusps, the width of cut must not exceed DC

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Number of inserts (or edges for solid tool)

⁽³⁾ Clamping wrench size

⁽⁴⁾ Maximum ramping angle

⁽⁵⁾ 0 - Without coolant supply, 1 - With coolant supply

⁽⁶⁾ Machinable diameter minimum for interpolation

⁽⁷⁾ Machinable diameter maximum for interpolation

⁽⁸⁾ Master insert identification

⁽⁹⁾ Recommended tightening torque (Nm) for insert screw

⁽¹⁰⁾ Tool tightening torque Nxmm

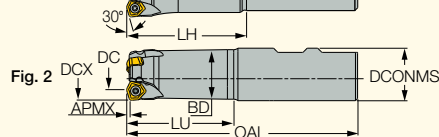
Spare Parts

Designation				
MF EWX D20-3-M10-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D25-4-M12-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D25-3-M12-05	SR 10508600	T-9/51		
MF EWX D32-4-M16-05	SR 10508600	T-9/51		
MF EWX D32-3-M16-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH

MF EWX

Moderate Feed Endmills
Carrying Double-Sided Inserts
with 6 Cutting Edges

Fig. 1



Designation	DCX ⁽¹⁾	DC	APMX	CICT ⁽²⁾	LU	LH	OAL	DCONMS	Shank ⁽³⁾	BD	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	Fig.	MIID ⁽⁷⁾	TQ (Nm) ⁽⁸⁾	kg
MF EWX D16-2-040-W20-04	16.00	9.00	1.50	2	40.0	47.0	99.00	20.00	W	14.90	3.8	25.00	31.00	2	H600 WXCUC 040310T	0.9	0.16
MF EWX D20-3-050-C20-04	20.00	13.00	1.50	3	50.0	52.7	134.00	20.00	C	18.90	2.4	33.00	39.00	2	H600 WXCUC 040310T	0.9	0.24
MF EWX D20-3-050-W20-04	20.00	13.00	1.50	3	50.0	52.7	104.00	20.00	W	18.90	2.4	33.00	39.00	2	H600 WXCUC 040310T	0.9	0.18
MF EWX D25-3-060-W25-05	25.00	15.50	2.00	3	60.0	63.0	120.00	25.00	W	23.60	3.0	40.50	49.00	2	H600 WXCUC 05T312T	2.0	0.33
MF EWX D32-4-080-W32-05	32.00	22.50	2.00	4	80.0	83.0	145.00	32.00	W	30.60	1.9	54.50	63.00	2	H600 WXCUC 05T312T	2.0	0.70
MF EWX D32-3-080-C32-07	32.00	19.70	2.70	3	80.0	83.0	165.00	32.00	C	30.70	3.0	51.70	63.00	2	H600 WXCUC 070515T	4.8	0.80
MF EWX D32-3-080-W32-07	32.00	19.70	2.70	3	80.0	83.0	145.00	32.00	W	30.70	3.0	51.70	63.00	2	H600 WXCUC 070515T	4.8	0.70
MF EWX D40-4-090-C32-07	40.00	27.70	2.70	4	90.0	92.0	190.00	32.00	C	36.80	2.0	67.70	79.00	1	H600 WXCUC 070515T	4.8	1.16

- To generate a straight surface without cusps, the width of cut must not exceed DC

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Number of inserts (or edges for solid tool)

⁽³⁾ C-Cylindrical, W-Weldon

⁽⁴⁾ Maximum ramping angle

⁽⁵⁾ Machinable diameter minimum for interpolation

⁽⁶⁾ Machinable diameter maximum for interpolation

⁽⁷⁾ Master insert identification

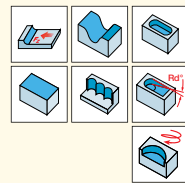
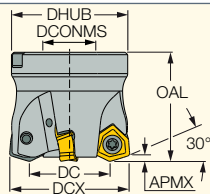
⁽⁸⁾ Recommended tightening torque (Nm) for insert screw

Spare Parts

Designation				
MF EWX D16-2-040-W20-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D20-3-050-C20-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D20-3-050-W20-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D25-3-060-W25-05	SR 10508600	T-9/51		
MF EWX D32-4-080-W32-05	SR 10508600	T-9/51		
MF EWX D32-3-080-C32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
MF EWX D32-3-080-W32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
MF EWX D40-4-090-C32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH

MF FWX

Moderate Feed Face Mills
Carrying Double-Sided Inserts
with 6 Cutting Edges



Designation	DC	DCX ⁽¹⁾	APMX	CICT ⁽²⁾	OAL	DHUB	DCONMS	CSP ⁽³⁾	Arbor	RMPX ⁽⁴⁾	MDN ⁽⁵⁾	MDX ⁽⁶⁾	MIID ⁽⁷⁾	TQ (Nm) ⁽⁸⁾	
MF FWX D040-05-16-05	30.60	40.00	2.00	5	35.00	38.00	16.00	1	A	1.4	70.60	79.00	H600 WXCUC 05T312T	2.0	0.17
MF FWX D050-06-22-05	40.50	50.00	2.00	6	40.00	48.00	22.00	1	A	1.0	90.50	99.00	H600 WXCUC 05T312T	2.0	0.30
MF FWX D052-06-22-05	42.50	52.00	2.00	6	40.00	48.00	22.00	1	A	1.0	94.50	103.00	H600 WXCUC 05T312T	2.0	0.32
MF FWX D063-08-22-05	53.50	63.00	2.00	8	40.00	48.00	22.00	1	A	0.8	116.50	125.00	H600 WXCUC 05T312T	2.0	0.41
MF FWX D040-04-16-07	27.70	40.00	2.70	4	35.00	38.00	16.00	1	A	2.0	67.70	79.00	H600 WXCUC 070515HP	4.8	0.17
MF FWX D050-05-22-07	37.70	50.00	2.70	5	40.00	48.00	22.00	1	A	1.4	87.70	99.00	H600 WXCUC 070515HP	4.8	0.31
MF FWX D052-05-22-07	39.70	52.00	2.70	5	40.00	48.00	22.00	1	A	1.3	91.70	103.00	H600 WXCUC 070515HP	4.8	0.32
MF FWX D063-06-22-07	50.70	63.00	2.70	6	40.00	48.00	22.00	1	A	1.0	113.70	125.00	H600 WXCUC 070515HP	4.8	0.42
MF FWX D080-07-32-07	67.70	80.00	2.70	7	55.00	76.00	32.00	1	A	0.8	147.70	159.00	H600 WXCUC 070515HP	4.8	1.21
MF FWX D100-08-32-07	87.70	100.00	2.70	8	50.00	78.00	32.00	1	B	0.6	187.70	199.00	H600 WXCUC 070515HP	4.8	1.46
MF FWX D050-04-22-08	34.70	50.00	3.50	4	45.00	48.00	22.00	1	A	2.5	84.70	99.00	H600 WXCUC 080612T	9.0	0.32
MF FWX D063-05-27-08	47.70	63.00	3.50	5	50.00	61.00	27.00	1	A	1.7	110.70	125.00	H600 WXCUC 080612T	9.0	0.63
MF FWX D080-06-32-08	64.70	80.00	3.50	6	55.00	76.00	32.00	1	A	1.2	144.70	159.00	H600 WXCUC 080612T	9.0	1.13
MF FWX D100-07-32-08	84.70	100.00	3.50	7	50.00	78.00	32.00	1	B	0.9	184.70	199.00	H600 WXCUC 080612T	9.0	1.37
MF FWX D125-09-40-08	109.70	125.00	3.50	9	55.00	90.00	40.00	1	B	0.7	234.70	249.00	H600 WXCUC 080612T	9.0	2.36
MF FWX D160-11-40-08	144.70	160.00	3.50	11	55.00	95.00	40.00	0	C	0.5	304.70	319.00	H600 WXCUC 080612T	9.0	3.63

• To generate a straight surface without cusps, the width of cut must not exceed DC

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Number of inserts (or edges for solid tool)

⁽³⁾ 0 - Without coolant supply, 1 - With coolant supply

⁽⁴⁾ Maximum ramping angle

⁽⁵⁾ Machinable diameter minimum for interpolation

⁽⁶⁾ Machinable diameter maximum for interpolation

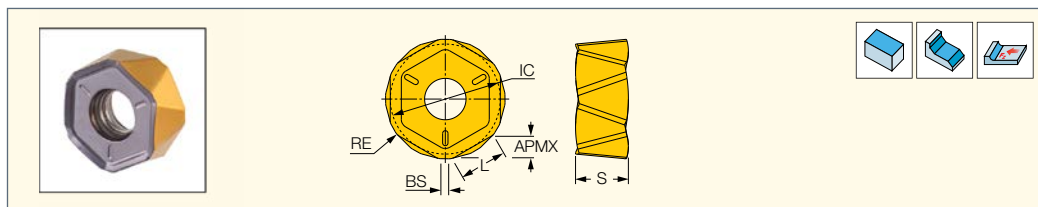
⁽⁷⁾ Master insert identification

⁽⁸⁾ Recommended tightening torque (Nm) for insert screw

Spare Parts

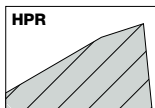
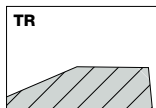
Designation					
MF FWX D040-05-16-05	SR 10508600	T-9/51			SR M8X25DIN912
MF FWX D050-06-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
MF FWX D052-06-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
MF FWX D063-08-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
MF FWX D040-04-16-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M8X25-D11.5
MF FWX D050-05-22-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M10X25 DIN912
MF FWX D052-05-22-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M10X25 DIN912
MF FWX D063-06-22-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M10X25 DIN912
MF FWX D080-07-32-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M16X30 DIN912
MF FWX D100-08-32-07	SR 34-535-SN		BLD T15/M7	SW6-T-SH	
MF FWX D050-04-22-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M10X25 DIN912
MF FWX D063-05-27-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M12X30DIN912
MF FWX D080-06-32-08	SR 14-591/H		BLD T20/S7	SW6-T	SR M16X30 DIN912
MF FWX D100-07-32-08	SR 14-591/H		BLD T20/M7	SW6-T	
MF FWX D125-09-40-08	SR 14-591/H		BLD T20/L7	SW6-T	
MF FWX D160-11-40-08	SR 14-591/H		BLD T20/L7	SW6-T	

HELI12FEED
UPFEED LINE
H1200 HXCU 0606
Double-Sided Hexagonal
Inserts with 12 Cutting Edges

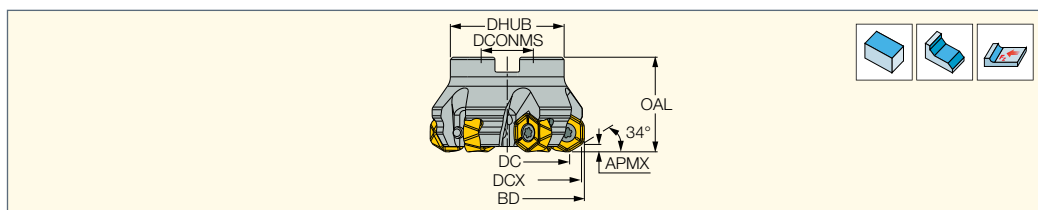


Designation	Dimensions						Tough ↔ Hard							Recommended Machining Data	
	APMX	L	BS	RE	IC	S	IC882	IC845	IC840	IC830	IC5500	IC808	IC810	a _p (mm)	f _z (mm/t)
H1200 HXCU 0606-HPR	3.00	6.43	1.06	1.60	14.88	7.15	•		•	•		•		0.20-3.00	0.08-0.40
H1200 HXCU 0606-TR	3.00	6.43	1.06	1.60	14.88	7.15		•		•	•	•	•	0.20-3.00	0.25-0.65

• TR-for steel and cast iron, HPR-for stainless steel and high temperature alloys



HELI12FEED
UPFEED LINE
MF FHX-R06
34° Face Mills Carrying
Hexagonal Inserts with
12 Cutting Edges



Designation	DCX ⁽¹⁾	BD	DC	CICT ⁽²⁾	APMX	OAL	DHUB	DCONMS	Arbor	CSP ⁽³⁾	MIID ⁽⁴⁾	TQ (Nm) ⁽⁵⁾	kg
MF FHX D052-05-22-R06	52.00	54.31	41.58	5	3.00	40.00	48.00	22.00	A	1	H1200 HXCU 0606-HPR	9.0	0.60
MF FHX D063-06-22-R06	63.00	65.40	53.40	6	3.00	40.00	48.00	22.00	A	1	H1200 HXCU 0606-HPR	9.0	0.46
MF FHX D080-07-27-R06	80.00	82.40	70.40	7	3.00	50.00	60.00	27.00	A	1	H1200 HXCU 0606-HPR	9.0	0.98
MF FHX D080-07-32-R06	80.00	82.40	70.40	7	3.00	50.00	66.00	32.00	A	1	H1200 HXCU 0606-HPR	9.0	0.86
MF FHX D100-09-32-R06	100.00	102.40	90.40	9	3.00	50.00	78.00	32.00	B	1	H1200 HXCU 0606-HPR	9.0	1.57
MF FHX D125-11-40-R06	125.00	127.40	115.40	11	3.00	50.00	92.00	40.00	B	1	H1200 HXCU 0606-HPR	9.0	2.44
MF FHX D160-13-40-R06	160.00	162.40	150.40	13	3.00	55.00	95.00	40.00	C	0	H1200 HXCU 0606-HPR	9.0	3.48

• Radius for programming is 5.4 mm • When machining next to shoulders, maximum width of cut should be 0.3xD

• To generate a straight surface without cusps, the width of cut must not exceed DC

⁽¹⁾ Cutting diameter maximum

⁽²⁾ Number of inserts (or edges for solid tool)

⁽³⁾ 0 - Without coolant supply, 1 - With coolant supply

⁽⁴⁾ Master insert identification

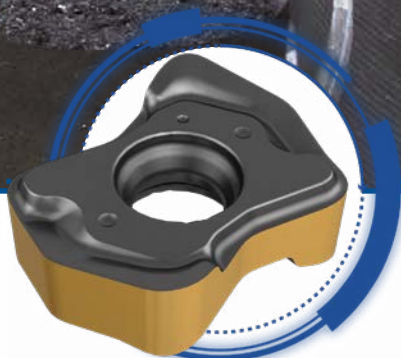
⁽⁵⁾ Recommended tightening torque (Nm) for insert screw

Spare Parts

Designation				
MF FHX D052-05-22-R06	SR 14-591/H	BLD T20/S7	SW6-T	
MF FHX D063-06-22-R06	SR 14-591/H	BLD T20/S7	SW6-T	SR M10X25 DIN912
MF FHX D080-07-27-R06	SR 14-591/H	BLD T20/S7	SW6-T	SR M12X30 DIN912
MF FHX D080-07-32-R06	SR 14-591/H	BLD T20/S7	SW6-T	SR M16X30 DIN912
MF FHX D100-09-32-R06	SR 14-591/H	BLD T20/M7	SW6-T	
MF FHX D125-11-40-R06	SR 14-591/H	BLD T20/M7	SW6-T	
MF FHX D160-13-40-R06	SR 14-591/H	BLD T20/M7	SW6-T	



LOGIQ4FEED
HIGH FEED MILLING



"Bone Shaped" Inserts
with 4 Cutting Edges
for Fast Feed Milling



Endmills with FLEX-FIT
Threaded Adaptation
for Fast Feed Milling

Cutting tool Materials for Indexable Milling

Grade	ISO Group						Notes
	P	M	K	N	S	H	
IC845	P25-P45						PVD
IC830/IC928	P20-P40	M25-M35			S15-S30		PVD
IC330/IC328	P25-P40	M30-M40			S20-S30		PVD
IC5500	P20-P35						CVD
IC808/IC908	P15-P30	M20-M30	K20-K30		S10-S25	H20-H30	PVD
IC810/IC910	P15-P30		K15-K35				PVD
IC30N	P10-P30					H10-H25	Cermet
IC5400	P10-P20						CVD
IC5600	P10-P15						CVD
IC882*		M25-M40			S20-S30		PVD
IC840*		M20-M35			S15-S25		PVD
IC716 **					S20-S25		PVD
IC1011 ***			K15-K40				PVD
IC5820		M20-M35			S15-S25		CVD
IC5100/IC4100			K10-K25				CVD
DT7150			K10-K25			H20-H30	CVD+PVD
IS8			K01-K15				Si ₃ N ₄
IC380					S15-S20	H15-H25	PVD
IC28				N15-N30			Uncoated
IC08				N10-N20			Uncoated
IC4				N05-N10			Uncoated

Post-coating SUMO-TEC® treatment

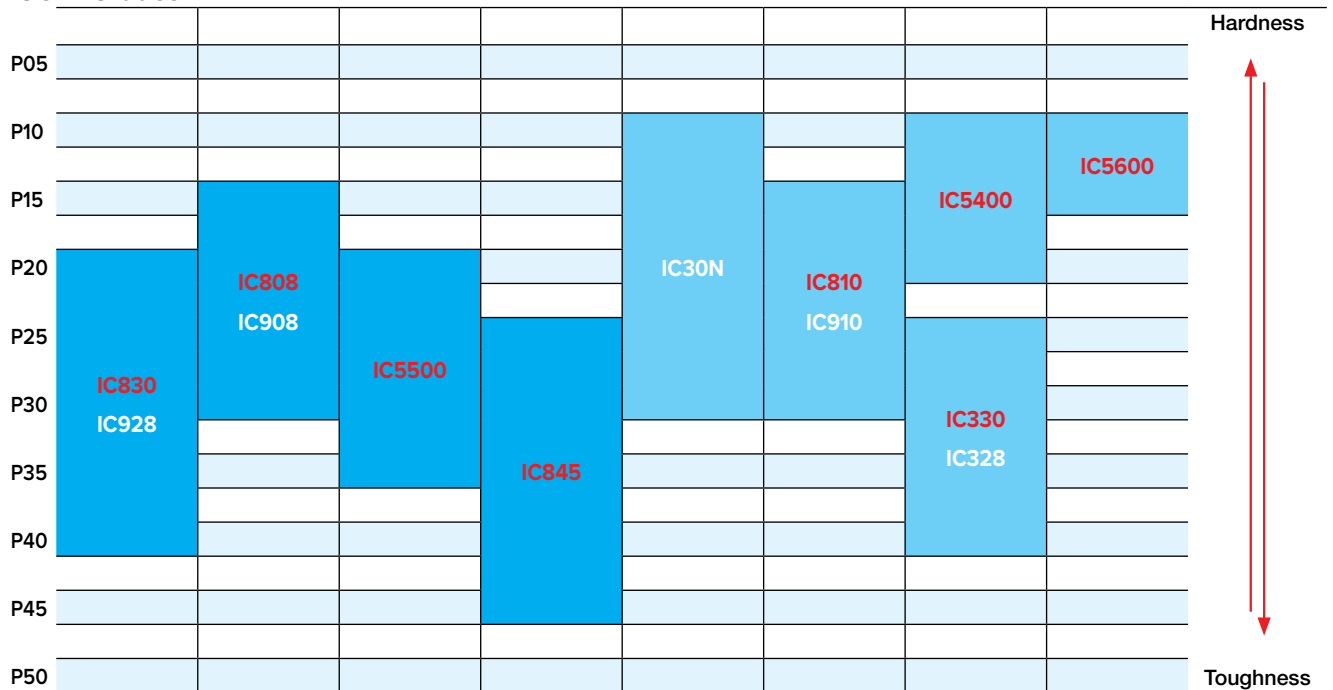
* Post-coating treatment

** Mainly for machining titanium alloys

*** For machining under demanding conditions and for operations with wet cooling

Main application range of grades is emphasized by **bold**

ISO P Grades



Post-coating SUMO TEC® treatment

ISO M Grades

							Hardness
M05							
M10							
M15							
M20	IC840						
M25		IC830 IC928					
M30							
M35			IC330 IC328				
M40							
							Toughness

	main grade		complementary grade
	Post-coating treatment		
	Post-coating SUMO TEC® treatment		

ISO K Grades

							Hardness
K05							
K10	IC5100 IC4100						
K15		IC810 IC910					
K20							
K25							
K30							
K35							
K40							Toughness

	main grade		complementary grade
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IS8 - a SiN grade for milling with extremely high vc

DT7150 - for special purpose wear-resisting alloy cast iron

IC1011 - a carbide grade designed for milling cast iron, specifically nodular cast iron, under demanding conditions. Suitable for operations with wet cooling.

	Post-coating SUMO TEC® treatment
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ISO N Grades

							Hardness
N05				IC4			
N10							
N15		IC08					
N20	IC28						
N25							
N30							
							Toughness

main grade
 complementary grade

ISO S Grades

								Hardness
S5								
S10								
S15	IC808			IC380				
S20	IC908	IC840			IC5820	IC830	IC716	
S25			IC882		IC330	IC928		
S30					IC328			
								Toughness

main grade
 complementary grade

IC380 - especially for milling Ti alloys stable conditions
 IC716 - mostly for milling Ti alloys

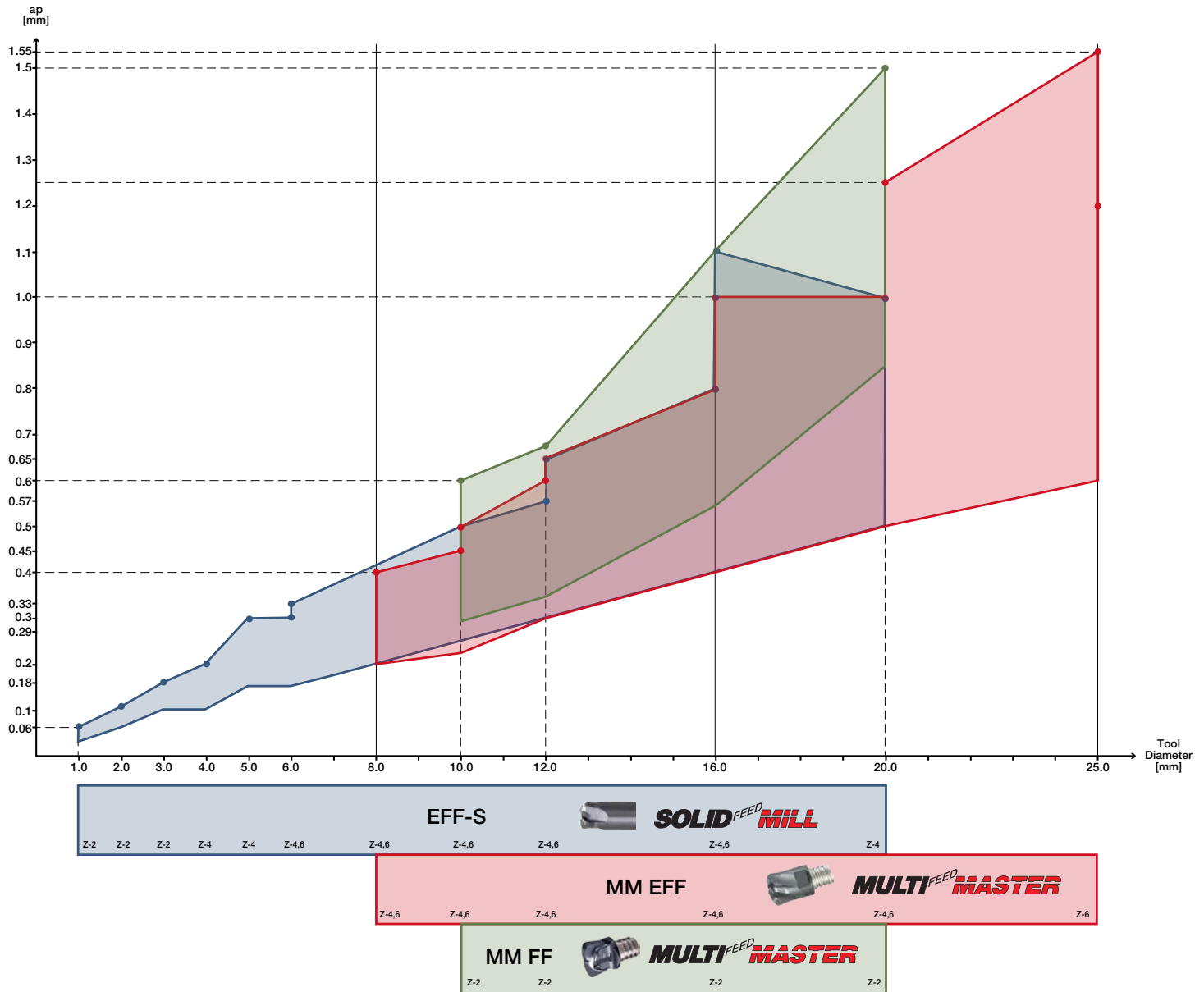
Post-coating treatment
 Post-coating SUMO TEC® treatment

ISO H Grades

							Hardness
H01							
H05							
H10							
H15							
H20				IC380	IC30N		
H25	IC808	DT7150					
H30	IC908						Toughness

main grade
 complementary grade

Solid Carbide Endmills and MULTI-MASTER Heads Chart



Fast Feed Family Selector for Solid Carbide Endmills (SCEM) and MULTI-MASTER Heads (MM)

Diameter range (mm)	Family	Description	ap (mm)	Range of fz (mm/t)	Applications								Material Groups				
													P	M	K	S	H
Ø1-20	SOLID FEED MILL	EFF-S	0.06-1.00	0.20-0.70	●	○	●	●	●	●	●	●	●	○	●	●	●
Ø8-25	MULTI-MASTER	MM-EFF	0.40-1.25	0.12-1.00	●	●	●	●		●	●	●	●	●	●	●	○
Ø10-20	MULTI-MASTER	MM FF	0.60-1.50	0.30-1.50	●	●	●	●		●	●	●	●	○	●	○	○

- - Most suitable
- - Suitable
- - May be used



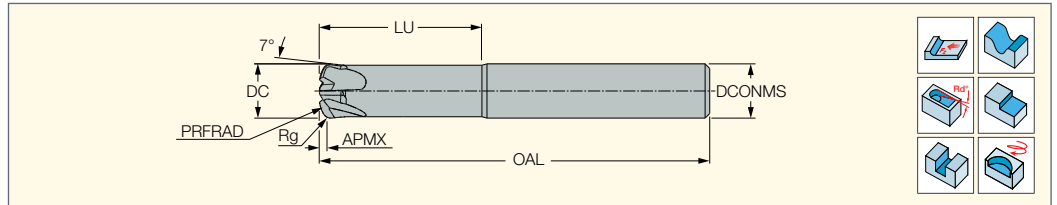
MULTI-MASTER



Interchangeable Solid Carbide
FEED-MILL Heads with 4 or 6
Flute, for High Feed Milling

EFF-S2/S4/S6

Solid Carbide Endmills with
Relieved Necks for Fast
Feed High Productivity



Designation	Dimensions											Tough ↔ Hard		Recommended Machining Data
	DC	DCONMS	OAL	NOF ⁽¹⁾	LU	Rg ⁽²⁾	PRFRAD	APMX	Shank ⁽³⁾	RMPX ^{o(4)}	CSP ⁽⁵⁾	IC903	IC902	
														f _z (mm/t)
EFF-S2 01-04/03C6RP.15M50	1.00	6.00	50.00	2	3.0	0.15	0.8	0.06	C	5.0	0		●	0.02-0.05
EFF-S2 02-07/06C6RP0.3M50	2.00	6.00	50.00	2	6.0	0.30	1.6	0.11	C	5.0	0		●	0.10-0.14
EFF-S2 03-1/09C06RP0.5M50	3.00	6.00	50.00	2	9.0	0.50	2.4	0.18	C	5.0	0		●	0.10-0.20
EFF-S2-04 2/14C06R0.57M58	4.00	6.00	58.00	2	14.0	0.57	3.5	0.20	C	3.0	0		●	0.06-0.15
EFF-S4-04 020/14C06M57	4.00	6.00	57.00	4	14.0	0.70	3.8	0.20	C	5.0	0		●	0.10-0.25
EFF-S2-05 2/17C06R0.65M58	5.00	6.00	58.00	2	17.0	0.65	4.0	0.27	C	3.0	0		●	0.08-0.20
EFF-S4-05 022/17C06M57	5.00	6.00	57.00	4	17.0	0.90	4.0	0.31	C	5.0	0		●	0.10-0.30
EFF-S2-06 2/20C06R0.7M58	6.00	6.00	58.00	2	20.0	0.70	5.0	0.33	C	3.0	0		●	0.10-0.30
EFF-S4-06 030/20C06R1.0M	6.00	6.00	57.00	4	20.0	1.23	5.3	0.29	C	5.0	0	●		0.10-0.30
EFF-S6-06 025/20C06R0.7M	6.00	6.00	57.00	6	20.0	0.70	5.0	0.33	C	3.0	0		●	0.10-0.25
EFF-S2-08 3/26C08R0.9M64	8.00	8.00	64.00	2	26.0	0.90	6.0	0.44	C	3.0	0		●	0.10-0.40
EFF-S4-08 035/26C08R1.3M	8.00	8.00	63.00	4	26.0	1.62	7.0	0.40	C	5.0	0	●		0.10-0.40
EFF-S6-08 025/26C08R0.86M	8.00	8.00	63.00	6	26.0	0.86	6.0	0.40	C	3.0	0		●	0.10-0.35
EFF-S2-10 3/30C10R1.15M73	10.00	10.00	73.00	2	30.0	1.15	8.0	0.50	C	3.0	0		●	0.15-0.40
EFF-S4-10 040/30C10R1.6M	10.00	10.00	72.00	4	30.0	2.01	8.8	0.50	C	5.0	0	●		0.15-0.50
EFF-S6-10 025/30C10R1.0M	10.00	10.00	72.00	6	30.0	1.00	6.0	0.50	C	3.0	0		●	0.15-0.45
EFF-S2-12 3/34C12R1.3M84	12.00	12.00	84.00	2	34.0	1.30	9.0	0.55	C	3.0	0		●	0.15-0.45
EFF-S4-12 045/34C12R2.0M	12.00	12.00	83.00	4	34.0	2.46	10.6	0.57	C	5.0	0	●		0.15-0.50
EFF-S6-12 030/34C12R1.2M	12.00	12.00	83.00	6	34.0	1.20	10.0	0.65	C	3.0	0		●	0.15-0.45
EFF-S4-16 055/42C16R2.6M	16.00	16.00	92.00	4	42.0	3.25	14.0	0.80	C	5.0	0	●		0.20-0.60
EFF-S6-16 045/42C16R2.0M	16.00	16.00	92.00	6	42.0	2.00	16.0	1.10	C	3.0	0		●	0.20-0.55
EFF-S4-20 060/46C20R3.2M	20.00	20.00	104.00	4	46.0	4.01	17.7	1.00	C	5.0	0	●		0.20-0.70

⁽¹⁾ Number of flutes

⁽²⁾ Radius for programming

⁽³⁾ C-Cylindrical

⁽⁴⁾ Maximum ramping angle

⁽⁵⁾ 0 - Without coolant supply, 1 - With coolant supply

Cutting Tool Materials for Solid Ceramic Endmills (SCEM)

Grade	ISO Group						Notes
	P	M	K	N	S	H	
IC1508				N10-N20			DLC coated
IC903	P10-P20	M15-M25	K10-K20		S10-S20	H10-H20	PVD
IC902	P05-P15	M10-M15	K05-K15		S05-S10	H05-H15	PVD
IC900	P15-P30	M20-M30	K20-K30		S10-S25	H20-H30	PVD
IC702	P05-P10					H05-H10	PVD
IC608	P10-P20	M10-M20	K10-K25		S10-S25	H15-H25	PVD
IC602	P05-P15	M10-M20			S10-S20	H01-H10	PVD
IS35			K10-K25		S10-S20		SiAlON ceramic
IS6			K05-K20		S05-S15		Si ₃ N ₄ ceramic
IC08				N10-N20			Uncoated

Main application range of grades is emphasized by **bold**

ISO P Grades for SCEM

							Hardness
P05							
		IC702*					
P10				IC902*			
P15	IC903		IC608				
P20		IC900					
P25							
P30							
P35							
P40							
P45							
P50							Toughness

 main grade

 complementary grade

* recommended mainly for HSM

ISO M Grades for SCEM

							Hardness
M05							
M10	IC608		IC902				
M15							
M20				IC903			
M25	IC900						
M30							
M35							
M40							
							Toughness

main grade
 complementary grade

ISO K Grades for SCEM

K05-K40							Hardness	
K05				IC902	IS6*			
K10	IC903		IC608					
K15								
K20		IC900						
K25								
K30								
K35								
K40								Toughness
 main grade								 complementary grade

* IS6 - Si₃N₄-based ceramic grade

** IS35 - SiAlON-based ceramic grade

ISO N Grades for SCEM

Grade	Hardness	Toughness
N05	Low	High
N10	Low-Medium	High-Medium
N15	Medium	Medium
N20	Medium-High	Medium-Low
N25	High	Low-Medium
N30	Very High	Low

* DLC coated grade

ISO S Grades for SCEM

							Hardness
S5			IC902*		IS6**		 
S10	IC608	IC900		IC903		IS35***	
S15							
S20							
S25							
S30							

main grade

complementary grade

* first choice for trochoidal milling

** IS6 - Si3N4-based ceramic grade is recommended mostly for Ni- and Co-based superalloys

*** IS35 - SiAlON-based ceramic grade is recommended mostly for Ni- and Co-based superalloys

ISO H Grades for SCEM

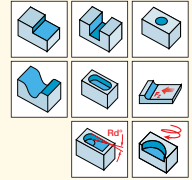
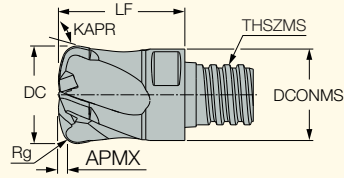
							Hardness
H01	IC602						
H05		IC902				IC702	
H10				IC903			
H15							
H20					IC900	IC608	
H25							
H30							

main grade

complementary grade

MM EFF

4, 6 Flute Solid Carbide Heads for Milling at Very Fast Feeds and Small D.O.C.



Designation	Dimensions											Tough ↔ Hard		Recommended Machining Data
	DC	NOF ⁽¹⁾	APMX	THSZMS	DCONMS	LF	RMPX ⁽²⁾	KAPR ⁽³⁾	FHA	Rg ⁽⁴⁾	CSP ⁽⁵⁾	IC908	IC903	
MM EFF080T3R1.62-4T05	8.00	4	0.40	T05	7.50	10.00	5.0	97.0	20.0	1.62	0		●	0.12-0.48
MM EFF080S2R0.86-6T05	8.00	6	0.40	T05	7.50	10.00	5.0	97.0	0.0	0.86	0		●	0.12-0.48
MM EFF100T4R2.01-4T06	10.00	4	0.50	T06	9.50	13.00	5.0	97.0	20.0	2.01	0		●	0.16-0.57
MM EFF100S2R1.0-6T06	10.00	6	0.45	T06	9.50	13.00	5.0	97.0	0.0	1.00	0		●	0.16-0.57
MM EFF100T2R1.0-6T06H	10.00	6	0.45	T06	9.50	10.00	3.0	97.0	20.0	1.00	1		●	0.16-0.47
MM EFF120T4R1.8-4T08H	12.00	4	0.60	T08	11.50	16.50	5.0	97.0	20.0	1.80	1	●	●	0.16-0.67
MM EFF120T4R2.47-4T08	12.00	4	0.60	T08	11.50	16.50	5.0	97.0	20.0	2.47	0		●	0.16-0.67
MM EFF120S3R1.2-6T08	12.00	6	0.65	T08	11.50	16.50	5.0	97.0	0.0	1.20	0		●	0.16-0.67
MM EFF120T2R1.2-6T08H	12.00	6	0.65	T08	11.50	12.00	3.0	97.0	20.0	1.20	1		●	0.16-0.54
MM EFF127T4R2.59-4T08	12.70	4	0.60	T08	12.20	16.50	5.0	97.0	20.0	2.59	0		●	0.16-0.67
MM EFF127S3R1.3-6T08	12.70	6	0.70	T08	12.70	16.50	5.0	97.0	0.0	1.30	0		●	0.16-0.67
MM EFF127T4R1.3-6T08H	12.70	6	0.70	T08	12.20	12.70	3.0	97.0	20.0	1.30	1		●	0.16-0.67
MM EFF160T5R2.2-4T10H	16.00	4	0.80	T10	15.40	20.50	5.0	97.0	20.0	2.20	1	●		0.20-0.75
MM EFF160T5R3.25-4T10	16.00	4	0.80	T10	15.40	20.50	5.0	97.0	20.0	3.25	0		●	0.20-0.75
MM EFF160S4R2.0-6T10	16.00	6	1.05	T10	15.40	20.50	5.0	97.0	0.0	2.00	0		●	0.20-0.75
MM EFF160T4R2.0-6T10H	16.00	6	1.05	T10	15.40	16.00	3.0	97.0	20.0	2.00	1		●	0.20-0.65
MM EFF200T6R4.02-4T12	20.00	4	1.00	T12	18.45	25.50	5.0	97.0	20.0	4.02	0		●	0.20-0.90
MM EFF200S5R2.2-6T12	20.00	6	1.25	T12	18.45	25.50	5.0	97.0	0.0	2.20	0		●	0.20-0.90
MM EFF200T5R2.2-6T12H	20.00	6	1.25	T12	18.45	20.00	3.0	97.0	20.0	2.20	1		●	0.20-0.80
MM EFF250A7R3.1-6T15	25.00	6	1.20	T15	23.90	25.00	5.0	97.0	30.0	3.10	0		●	0.25-1.00
MM EFF250S6R2.5-6T15	25.00	6	1.55	T15	23.90	25.00	5.0	97.0	0.0	2.50	0		●	0.25-1.00
MM EFF254A7R3.1-6T15	25.40	6	1.20	T15	23.90	25.00	5.0	97.0	30.0	3.10	0		●	0.25-1.00

• Do not apply lubricant to the threaded connection • Heads with coolant supply are recommended for shouldering operations

⁽¹⁾ Number of flutes

⁽²⁾ Maximum ramping angle

⁽³⁾ Tool cutting edge angle

⁽⁴⁾ Radius for programming

⁽⁵⁾ 0 - Without coolant supply, 1 - With coolant supply

MULTI-MASTER Machining Recommendations for MM EFF Heads

VDI 3323	Material Group ⁽¹⁾	v _c (m/min)	f _z (mm/t) vs. Tool Diameter (mm) ^(5,6)							
			a _p	a _e	8	10	12	16	20	25
P	1	180	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	2	160	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	3	160	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	4	160	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	5	150	0.045xD	0.7xD	0.43	0.50	0.57	0.65	0.75	0.87
	6	150	0.045xD	0.7xD	0.33	0.40	0.48	0.57	0.67	0.78
	7	140	0.045xD	0.7xD	0.33	0.40	0.48	0.57	0.67	0.78
	8	140	0.045xD	0.7xD	0.30	0.35	0.43	0.52	0.60	0.70
	9	140	0.045xD	0.7xD	0.30	0.35	0.43	0.52	0.60	0.70
	10	130	0.04xD	0.6xD	0.28	0.33	0.38	0.48	0.57	0.67
	11	120	0.04xD	0.6xD	0.25	0.30	0.35	0.43	0.52	0.62
	12, 13	120	0.04xD	0.6xD	0.30	0.35	0.43	0.52	0.60	0.70
K	15-16	180	APMX	0.7xD	0.45	0.52	0.60	0.70	0.80	0.90
	17-18	160	APMX	0.7xD	0.38	0.45	0.52	0.60	0.70	0.80
H	38.1 ⁽²⁾	100	0.035xD	0.45xD	0.20	0.25	0.33	0.40	0.48	0.55
	38.2 ⁽³⁾	80	0.03xD	0.3xD	0.16	0.22	0.30	0.38	0.45	0.52
	39 ⁽⁴⁾	60	0.02xD	0.25xD	0.12	0.16	0.16	0.20	0.20	0.25

⁽¹⁾ ISCAR material group Based on VDI 3323 standard

⁽²⁾ HRC 45-49

⁽³⁾ HRC 50-55

⁽⁴⁾ HRC 56-63

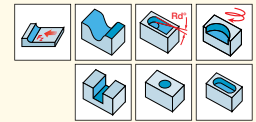
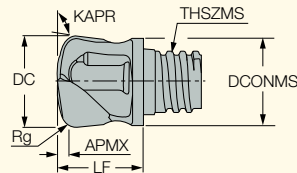
⁽⁵⁾ For Full Slot: f_z slot=0.6 x f_z

⁽⁶⁾ For Ramp Down: f_z ramp=0.1 x f_z

a_p - Depth of cut
a_e - Width of cut

MM FF

Interchangeable 2 Flute
FEED-MILL Solid Carbide
Heads for Milling at Very Fast
Feeds and Small D.O.C.


ECONOMICAL SOLUTION

Designation	Dimensions										Tough ↔ Hard		Recommended Machining Data
	DC	NOF ⁽¹⁾	APMX	Rg ⁽²⁾	THSZMS	DCONMS	LF	CSP ⁽³⁾	KAPR ⁽⁴⁾	RMPX ⁽⁵⁾	IC908	IC903	
MM FF100R1.5-L12-2T06	10.00	2	0.60	2.00	T06	9.60	12.50	0	97.0	7.0	●		0.30-0.60
MM FF120R2.0-2T08	12.00	2	0.68	2.50	T08	11.50	11.10	0	97.0	7.0	●	●	0.50-1.00
MM FF160R2.0-2T10	16.00	2	1.10	3.00	T10	15.20	13.50	0	97.0	7.0	●		0.55-1.10
MM FF200R2.0-2T12	20.00	2	1.50	3.40	T12	18.45	17.40	0	95.0	7.0	●		0.75-1.50

• Do not apply lubricant to the threaded connection

⁽¹⁾ Number of flutes

⁽²⁾ Radius for programming

⁽³⁾ 0 - Without coolant supply, 1 - With coolant supply

⁽⁴⁾ Tool cutting edge angle

⁽⁵⁾ Maximum ramping angle

Machining Example:

Shank: MM S-B-L140-C16-T08

Milling head: MM FF 120R2.0-2T08

Workpiece material: SAE 4340 HRC 28

Plunging

a_p = 2 mm

v_c = 80 m/min

v_f = 0.24 mm/min

Milling

a_p = 0.7 mm

a_e = 8 mm

v_c = 150 m/min

f_z = 1 mm/tooth

v_f = 7960 mm/min

Machining Example:

Shank: MM S-A-L070-W20-T10

Milling head: MM FF160R2.0-2T10 908

Workpiece material: P20 HRC 52

Milling

a_p = 0.2 mm

a_e = 6 mm

v_c = 150 m/min

f_z = 1.4 mm/tooth

v_f = 8355 mm/min

T = 60 min

Cutting Tool Materials for MULTI-MASTER Milling Heads

Grade	ISO Group						Notes
	P	M	K	N	S	H	
IC903	P10-P20	M15-M25	K10-K20		S10-S20	H10-H20	PVD
IC908	P15-P30	M20-M30	K20-K30		S10-S25	H20-H30	PVD
IC928	P20-P40	M25-M35			S15-S30		PVD
IC608	P10-P20	M10-M20	K10-K25		S10-S25	H15-H25	PVD
IC528*	P25-P45	M30-M40			S15-S30		PVD
IC08				N10-N20			Uncoated
IC28				N15-N30			Uncoated

* for MM TRD thread milling heads

Main application range of grades is emphasized by **bold**

ISO P Grades for MM Heads

P05								Hardness
P10								
P15	IC903				IC608			
P20		IC908						
P25								
P30			IC928*					
P35			IC528**					
P40								
P45								
P50								
								Toughness

main grade

complementary grade

* used mainly for special items

** for MM TRD thread milling heads

ISO M Grades for MM Heads

							Hardness
M05							
M10							
M15	IC608						
M20				IC903			
M25		IC908					
M30					IC928		
M35				IC528*			
M40							Toughness

main grade
 complementary grade

* for MM TRD thread milling heads

ISO K Grades for MM Heads

							Hardness
K05							
K10							
K15		IC903		IC608			
K20							
K25	IC908						
K30							
K35							
K40							Toughness

main grade
 complementary grade

ISO N Grades for MM Heads

							Hardness
N05							
N10							
N15		IC08					
N20				IC28			
N25							
N30							
							Toughness

main grade
 complementary grade

ISO S Grades for MM Heads

							Hardness
S5							
S10							
S15				IC903*			
S20							
S25							
S30							
							Toughness

main grade
 complementary grade

* used mainly for special items
 ** for MM TRD thread milling heads

ISO H Grades for MM Heads

							Hardness
H05							
H10							
H15							
H20							
H25							
H30							
							Toughness

main grade
 complementary grade

Tool Material Grades for Milling Summary Chart

Grade	Coating	ISO Group						Indexable Milling	SCEM	MM Heads
		P	M	K	N	S	H			
DT7150	CVD+PVD			K10-K25			H20-H30	●		
IC5820	CVD		M20-M35			S15-S25		●		
IC5600	CVD	P10-P15						●		
IC5500	CVD	P20-P35						●		
IC5400	CVD	P10-P20						●		
IC5100/IC4100	CVD			K10-K25				●		
IC1508	DLC Coat.				N10-N20				●	
IC1011 ⁽⁴⁾	PVD			K15-K40				●		
IC928	PVD	P20-P40	M25-M35			S15-S30		●		●
IC908	PVD	P15-P30	M20-M30	K20-K30		S10-S25	H20-H30	●		●
IC903	PVD	P10-P20	M15-M25	K10-K20		S10-S20	H10-H20		●	●
IC902	PVD	P05-P15	M10-M15	K05-K15		S05-S10	H05-H15		●	
IC900	PVD	P15-P30	M20-M30	K20-K30		S10-S25	H20-H30		●	
IC882 ⁽¹⁾	PVD		M25-M40			S20-S30		●		
IC845	PVD	P25-P45						●		
IC840 ⁽¹⁾	PVD		M20-M35			S15-S25		●		
IC830	PVD	P20-P40	M25-M35			S15-S30		●		
IC810/IC910	PVD	P15-P30		K15-K35				●		
IC808	PVD	P15-P30	M20-M30	K20-K30		S10-S25	H20-H30	●		
IC716 ⁽²⁾	PVD					S20-S25		●		
IC702	PVD	P05-P10					H05-H10		●	
IC608	PVD	P10-P20	M10-M20	K10-K25		S10-S25	H15-H25		●	●
IC602	PVD	P05-P15	M10-M20			S10-S20	H01-H10		●	
IC528 ⁽³⁾	PVD	P25-P45	M30-M40			S15-S30				●
IC380 ⁽⁴⁾	PVD					S15-S20	H15-H25	●		
IC330	PVD	P25-P40	M30-M40			S20-S30		●		
IC30N		P10-P30					H10-H25	●		
IC28					N15-N30			●		●
IC08					N10-N20			●	●	●
IC4					N05-N10			●		
IS35	Ceramic			K10-K25		S10-S20			●	
IS8	Ceramic			K05-K20		S05-S15		●		
IS6	Ceramic			K05-K10		S05-S10			●	

Post-coating SUMO-TEC® treatment

*1 Post-coating treatment

*2 Mainly for milling Ti alloys

*3 For MM TRD thread milling heads

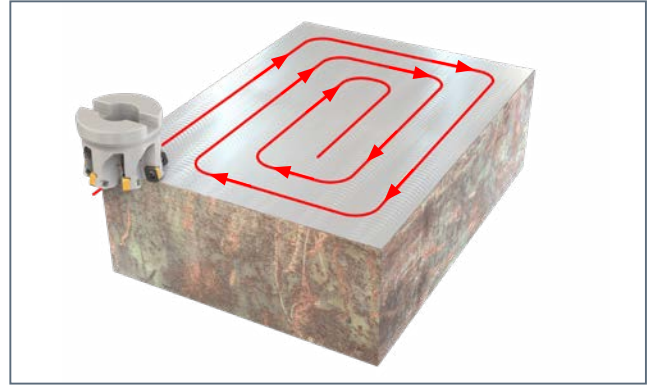
*4 For machining under demanding conditions and for operations with wet cooling

Recommendations for Machining Methods

Face Milling

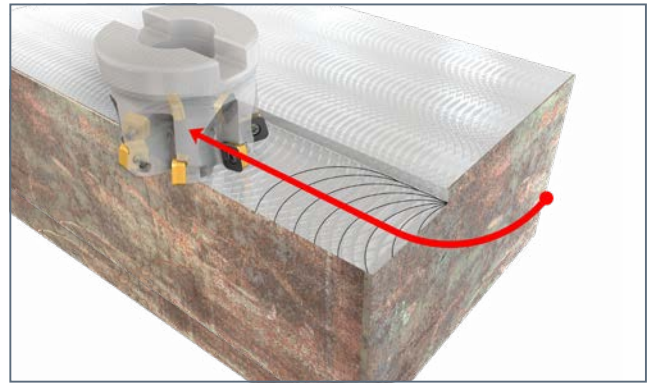
Including Milling Next to Square Shoulder

- It is recommended that the width of cut be no more than diameter DC in order to prevent tooth overloading, because of excess machining allowance in cusps produced on the additional passes after stepdown.
- Down (climb) milling is preferable.



Cutting Into Material

In milling, an approach cut by arc ("rolling in") is preferable. When a milling cutter enters a machined material by arc, the chip thickness (and therefore, loading the cutting edge) grows to a maximum value progressively and then gradually diminishes to zero. It significantly contributes to machining stability, improves tool life, and reduces vibrations.

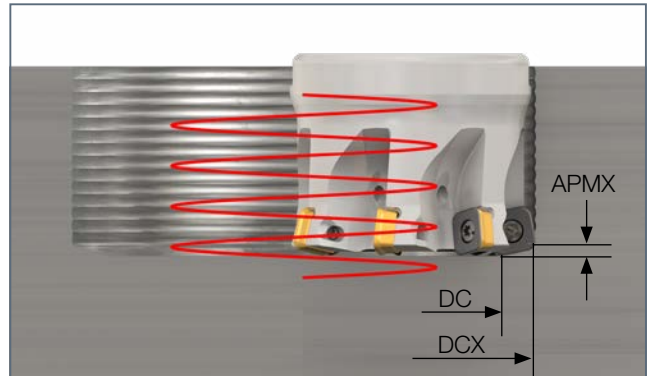


Milling Hole of Diameter D By Helical Interpolation

Maximum and minimum hole diameters
Dmax and Dmin correspondingly:

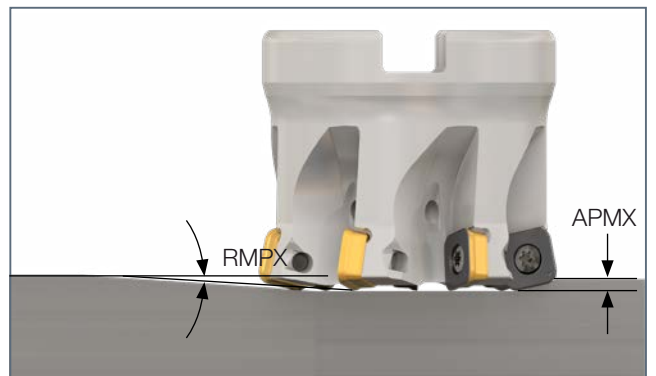
$$D_{max} = 2 \times DCX - 1, D_{min} = DCX + DC$$

- Down (climb) milling is recommended, however if chip evacuation is problematic, up (conventional) milling may provide better results.
- Helical pitch should not exceed the maximum depth of cut APMX.
- Helix angle should not exceed the maximum ramping angle RMPX.
- It is recommended to reduce feed per tooth f_z by 30-40%.



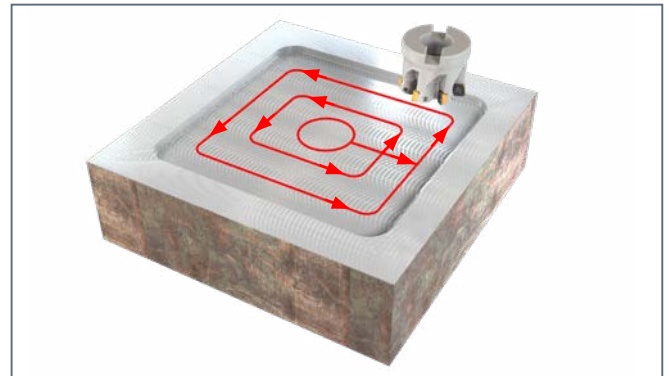
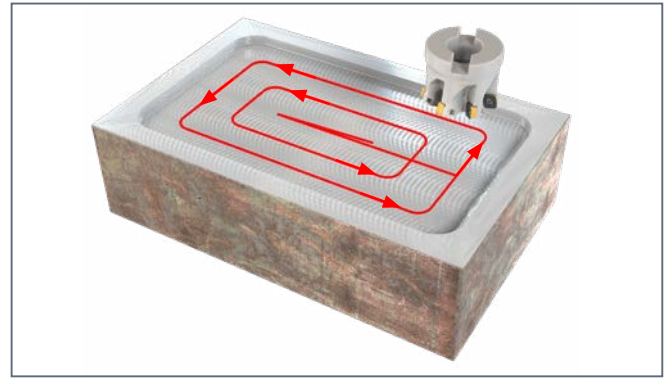
Milling by Ramping Down

- Depth of ramping per pass should not exceed maximum depth of cut APMX.
- Ramping angle should not exceed maximum ramping angle RMPX.
- Down (climb) milling is preferable
- It is recommended to reduce feed per tooth f_z by 30-40%.



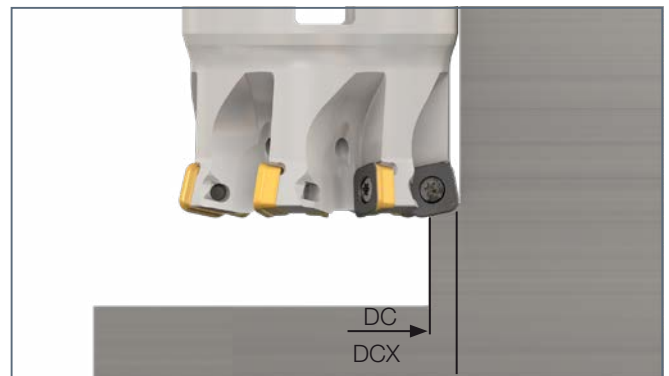
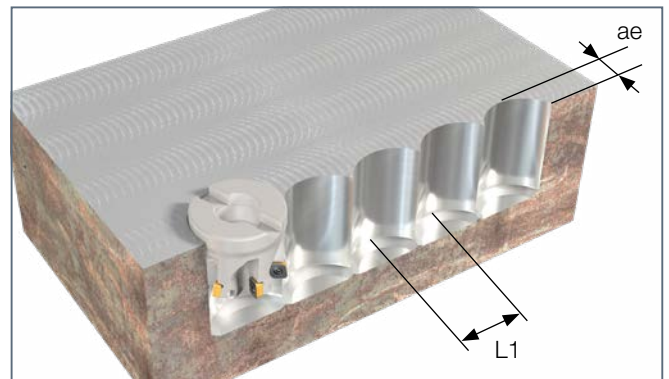
Pocket Milling

- In pocket milling, machining from the center to outside contour is preferable.
- In ramping down by line or helix, depth of ramping per pass should not exceed the maximum depth of cut APMX and the ramping angle should not exceed the maximum ramping angle RMPX.
- In ramping down passes, it is recommended to reduce feed per tooth f_z by 30-40%.



Side Plunge Milling

- The relationship between $L1_{max}$ and a_e is given by the following formulas:
- $a_{e_{max}} = (DCX - DC)/2$
- $L1_{max} = 2 \times \sqrt{(DCX \times a_e - a_e^2)}$
- Plunge milling is an effective and economical method for machining deep cavities, walls, slots and shapes.
- Plunge milling can provide a good solution for unstable and low-power milling machine tools.



YOU

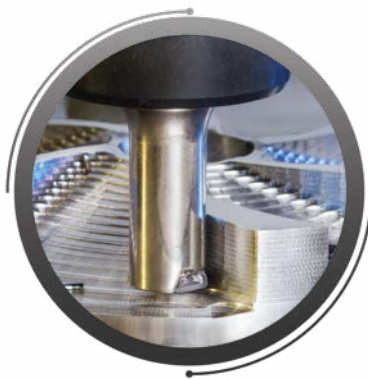
INTELLIGENTLY?

MACHINING

FAST FEED MILLING

Quick Tool Selector Guide

Metric



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