

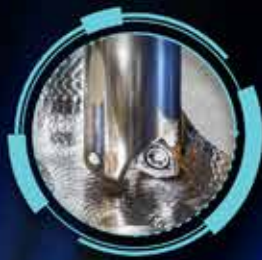
FAST FEED MILLING

Quick Tool Selector Guide

Imperial Version



TANG4FEED
HI-FEED MILLING



MICRO3FEED
MF 300 ENDMILL



NAN3FEED
NANO FEED MILL



MILL4FEED
HIGH FEED



LOGIQ4FEED
HIGH FEED MILLING



in³/min
cm³/min

ISCAR Features **INDUSTRY 4.0** Milling Tool Assemblies Online

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Faster & Much Faster

The remarkable progress made in the area of rough milling in the 1990's saw the introduction of fast feed milling (FF), also referred to as high feed milling (HFM). These highly efficient methodologies overturned established views and brought radical new ideas to the field.

Rather than use the traditional high metal removal technique – milling with considerable depths and widths of cut – users of the new approach continued to machine with similar width of cuts, although they used a much smaller depth of cut and applied much faster speeds with substantially increased feed per tooth.

Milling with a large axial depth of cut (DOC) requires the kind of cutting force provided by high-power machine tools, whereas FF roughing with shallow DOC needs a lot less

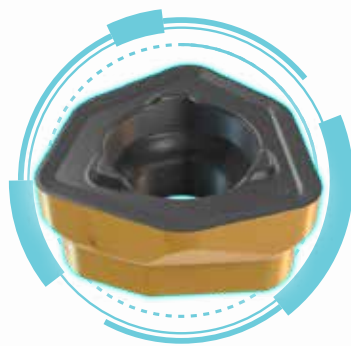
machine power, although the cutting tool should run fast. Therefore, light-duty machines featuring axis drives with sufficient velocity are sufficient for FF milling.

Energy saving shallow-cut “fast” technology provides an excellent alternative to power consuming deep-cut methods. Impressive high metal removal rates (MRR) at reduced power input is not the only advantage of the strategy- FF milling delivers two additional benefits.

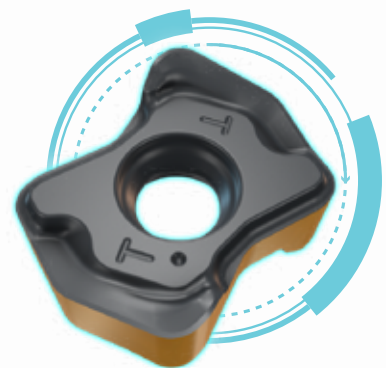
Shallow DOC enables contours to be produced that are very close to the final required shape of a machined surface, reducing or even eliminating semi-finish passes. In addition, the small cutting edge angles of FF milling cutters allows considerable increases in feeds and speeds per tooth (fz) due to the effect of chip thinning.



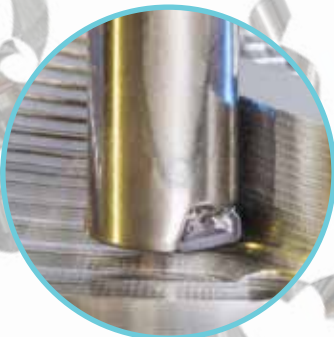
NAN3FEED
NANO FEED MILL

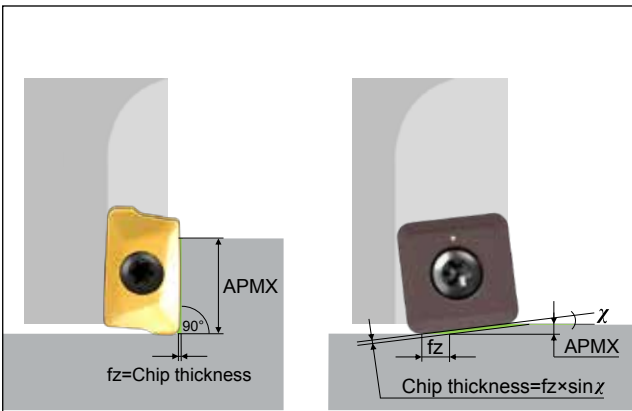


MICRO3FEED
MF 300 ENDMILL



LOGIQ4FEED
HIGH FEED MILLING

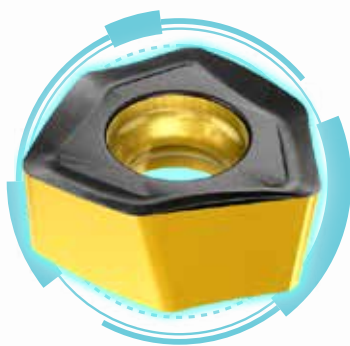




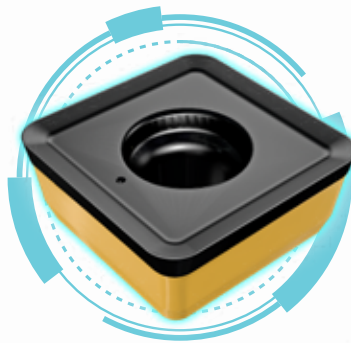
Although FF strategies began in the area of indexable milling, they soon extended to solid carbide endmills and became popular in the global die and mold making industry due to their efficiency when machining complicated shapes and cavities, especially of small sizes. Due to diverse and frequent changing working programs, fast low-power machining centers and advanced CAD/CAM software, die and mold producers quickly saw the value of the new strategy.

This advantageous geometry minimizes the radial effect of the cutting force and maximizes its axial influence, resulting in forces that act towards the spindle axis, i.e. the direction of maximum machine tool rigidity. The result - improved milling stability, reduced vibrations, prolonged tool life, reduced power consumption and increased productivity.

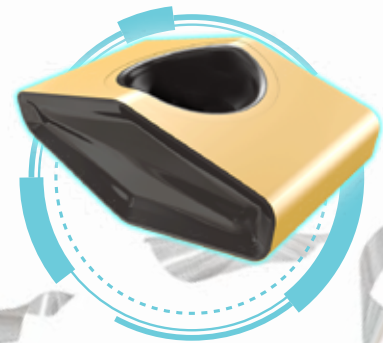
Although carbide endmills were the most commonly used cutting tools, FF milling cutters of relatively small diameters were also very popular prior to the introduction of the new strategy. Subsequently, the FF approach came to fast feed facing ("triple F") and opened the way to the development of various indexable face milling cutters. Now, given the amount of face milling that takes place in this major global area, general engineering is the main consumer of these tools.



HELI6 FEED
UPFEED LINE



MILL4 FEED
HIGH FEED



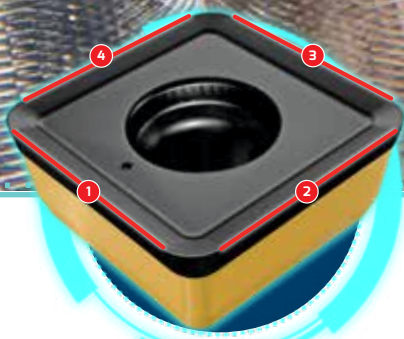
TANG4 FEED
HI-FEED MILLING





MILL4FEED

HIGH FEED



**4 Cutting Edged
Square Insert**



**Highly Durable
Straight Cutting Edge**

Fast Feed Milling Cutters

These 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.

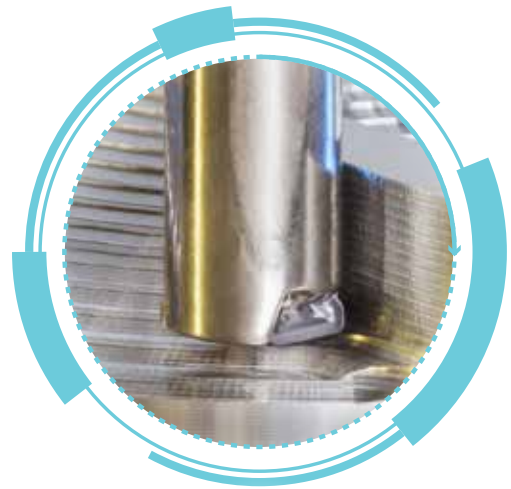
Another concept is based on using one or two straight edges that are chords of the arc. In both cases, the small cutting edge angle (usually 9-17°) meets the requirements of chip thinning and total cutting force. Ensuring the geometry of solid carbide fast feed endmills and replaceable milling heads 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.



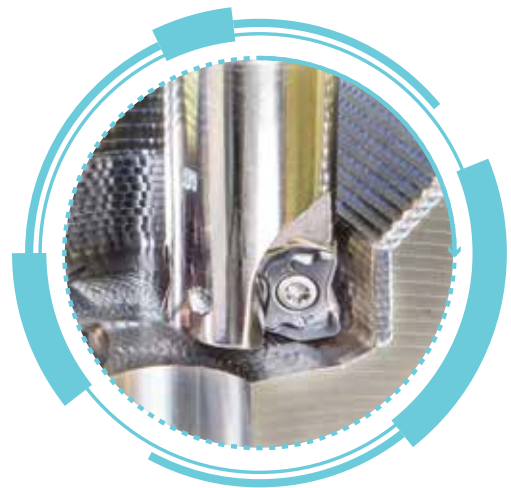
Although the introduction of innovative carbide grades and advances in the form of rake faces has further improved progress in FF milling cutters, the essential element of fast feed milling – geometry – remains constant.

Chip thinning due to the cutting edge of a FF milling cutter is the arc of a great circle (or the chords that approximate the arc), making the cutter a toroidal tool. The latter being rotated around their axis produces a torus or ring-shape. A typical representation of a toroidal tool is a milling cutter carrying round (button) inserts.

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



NAN3FEED
NANO FEED MILL

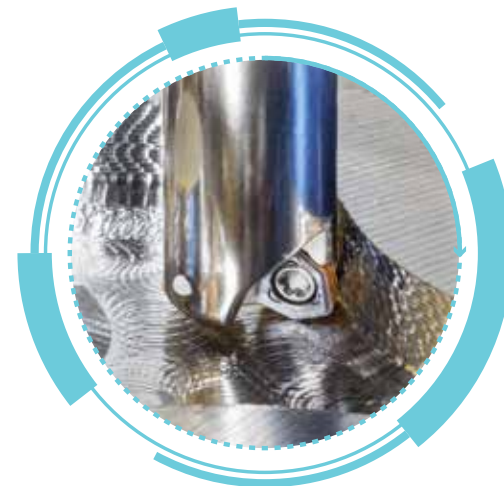


LOGIQ4FEED
HIGH FEED MILLING





TANG4FEED
HI-FEED MILLING



MICRO3FEED
MF 300 ENDMILL

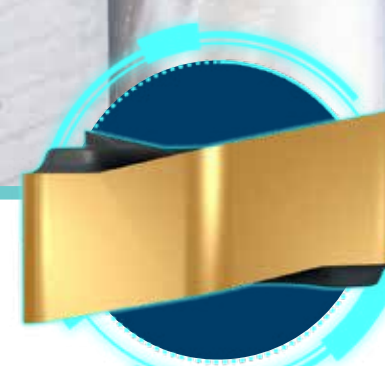
diameter of the cutter, i.e. to the maximal depth of cut (it is equal to the insert radius) and the maximal cutting edge angle.

But if the cutter mills under the maximal depth, the chip is thinner; and therefore the programmed feed should be increased correspondingly in order to produce the chips of required thickness. The same situation is observed in ball-nose milling tools, and explains why FF cutters run so fast.

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 for quick selection of the most suitable fast milling tool for a specific application depending on the material to be machined, the type of operation (like milling plane, pocket etc.), machining stock, and others.



LOGIQ4FEED
HIGH FEED MILLING



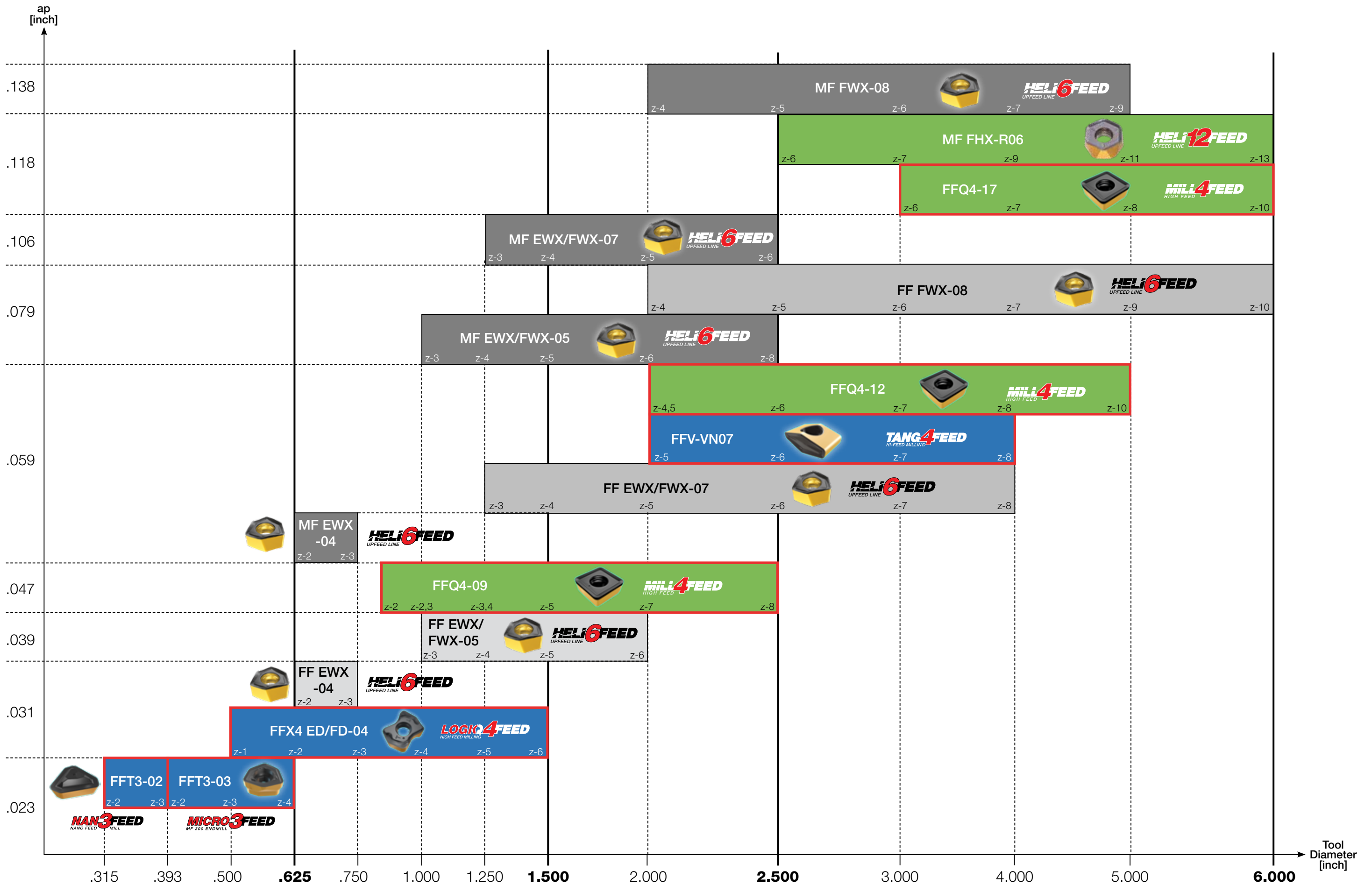
**Twisted Shape
High Rake Angle**



Unique Insert Shape

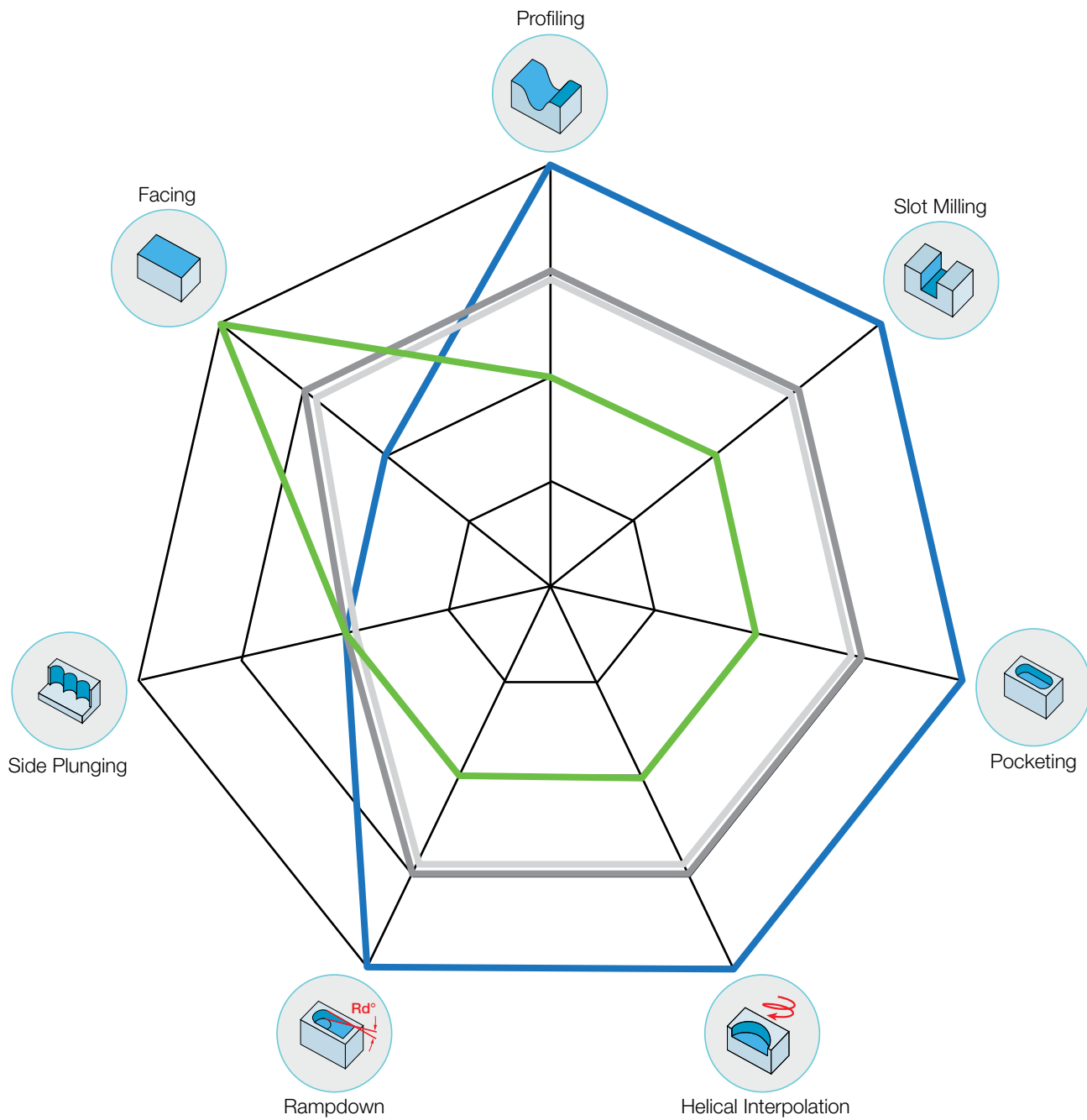


ISCAR Fast Feed (High Feed) Milling Chart



FAST FEED MILLING

General Application Chart



- Recommended mainly for pocket milling
- Recommended mainly for face milling
- Recommended for general applications
- Recommended for general applications
Suitable for machines with a limited table feed or heavy workpiece
- Z-X Number of inserts
- LOGIQ campaign

Fast Feed Family Selector for Indexable Inserts

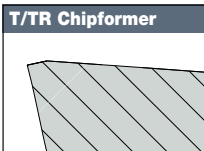
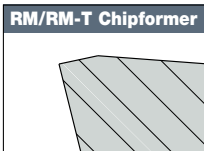
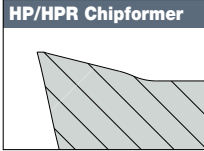
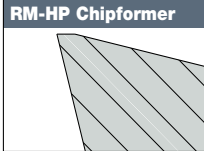
Range of diameters (inch)	Family	Description	APMX (inch)	Available diameters (inch) for configuration			Insert			
				Endmill	Multi-Master		Description	Chipformer	No. of sideds	No. edges
Ø.315-.625	NAN3FEED	FFT3 EFM-02	.023	.315-.393	.315-.393		FFT3 TXMT 020105T	T	1	3
	MICRO3FEED	FFT3 EFM-03	.023	.375-.625	.394-.630		FFT3 WXMT 030206T	T	1	3
	LOGIQ4FEED	FFX4 ED	.031	.050-.625	.630		FFX4 XNMU 040310	T, HP	2	4
	HELI6FEED	FF EWX-04	.039	.625	.630		H600 WXCJ 040310	T, HP	2	6
	HELI6FEED	MF EWX-04	.047	.625			H600 WXCJ 040310	T, HP	2	6

Range of diameters (inch)	Family	Description	APMX (inch)	Available diameters (inch) for configuration				Insert			
				Endmill	Multi-Master	FLEXFIT	Facemill	Description	Chipformer	No. of sideds	No. edges
Ø.630-1.50	LOGIQ4FEED	FFX4 ED/FD	.031	.750-1.25		.787-1.38	1.5	FFX4 XNMU 040310	T, HP	2	4
	HELI6FEED	FF EWX-04	.031	0.75	.630-.984	.787-.984		H600 WXCJ 040310	T, HP	2	6
	HELI6FEED	FF EWX/FWX-05	.039	1.00-1.50	.984	.787-1.375		H600 WXCJ 05T312	T, HP	2	6
	MILL4FEED	FFQ4-09	.047	.875-1.50		1.50	1.50	FFQ4 SOMT 0904	T, RM-T, HP	1	4
	HELI6FEED	MF EWX-04	.059	.750		.787-1.26		H600 WXCJ 040310	T, HP	2	6
	HELI6FEED	FF EWX/FWX-07	.059	1.25-1.50		1.26	1.50	H600 WXCJ 070515	T, HP	2	6
	HELI6FEED	MF EWX/FWX-05	.079	1.00-1.50		.984-1.26	1.50	H600 WXCJ 05T312	T, HP	2	6
	HELI6FEED	MF EWX/FWX-07	.106	1.25-1.50		1.26	1.50	H600 WXCJ 070515	T, HP	2	6

Range of diameters (inch)	Family	Description	APMX (inch)	Available diameters (inch) for configuration		Insert			
				Endmill	Facemill	Description	Chipformer	No. of sideds	No. edges
Ø1.57-2.50	HELI6FEED	FF EWX/FWX-05	.039	1.575	2.00	H600 WXCJ 05T312	T, HP	2	6
	MILL4FEED	FFQ4-09	.047		2.00-2.50	FFQ4 SOMT 0904	T, RM-T, HP	1	4
	HELI6FEED	FF FWX-07	.059		2.00-2.50	H600 WXCJ 070515	T, HP	2	6
	TANG4FEED	FFV-D-R-VN07	.059		2.00-2.50	FF VNMT 0706ZN	ER, ETR	2	4
	MILL4FEED	FFQ4-12	.059		2.00-2.50	FFQ4 SOMT 1205	T, T20, RM-T, HP, RM-HP	1	4
	HELI6FEED	MF FWX-05	.079		2.00-2.50	H600 WXCJ 05T312	T, HP	2	6
	HELI6FEED	FF FWX-08	.079		2.00-2.50	H600 WXCJ 0806	T, HP, RM	2	6
	HELI6FEED	MF FWX-07	.106		2.00-2.50	H600 WXCJ 070515	T, HP	2	6
	HELI12FEED	MF FHX-R06	.118		2.50	H1200 HXCJ 0606	TR, HPR	2	12
HELI6FEED	MF FWX-08	.138		2.00-2.50	H600 WXCJ 0806	T, HP, RM	2	6	

Range of diameters (inch)	Family	Description	APMX (inch)	Available diameters (inch) for configuration		Insert			
				Facemill	Facemill	Description	Chipformer	No. of sideds	No. edges
Ø3.00-6.00	HELI6FEED	FF FWX-07	.059		3.00-4.00	H600 WXCJ 070515	T, HP	2	6
	TANG4FEED	FFV-D-R-VN07	.059		3.00-4.00	FF VNMT 0706ZN	ER, ETR	2	4
	MILL4FEED	FFQ4-12	.059		3.00-5.00	FFQ4 SOMT 1205	T, T20, RM-T, HP, RM-HP	1	4
	HELI6FEED	FF FWX-08	.079		3.00-6.00	H600 WXCJ 0806	T, HP, RM	2	6
	HELI6FEED	MF FWX-07	.106		3.00-4.00	H600 WXCJ 070515	T, HP	2	6
	MILL4FEED	FFQ4-17	.118		3.00-6.00	FFQ4 SOMT 1706	T, RM-T, HP	1	4
	HELI12FEED	MF FHX-R06	.118		3.00-6.00	H1200 HXCJ 0606	TR, HPR	2	12
	HELI6FEED	MF FWX-08	.138		3.00-5.00	H600 WXCJ 0806	T, HP, RM	2	6

Insert Chipformer Types

 <p>T/TR Chipformer</p>	<p>T / TR - For steel, ferritic and martensitic stainless steel, cast iron and hardened steel</p>	 <p>RM/RM-T Chipformer</p>	<p>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</p>
 <p>HP/HPR Chipformer</p>	<p>HP / HPR - For austenitic stainless steel and high temperature alloys</p>	 <p>RM-HP Chipformer</p>	<p>RM-HP - For interrupted cut and for machining near straight wall shoulders of austenitic stainless steel and high temperature alloys</p>

Range of fz (ipt)	Radius for Programming	Applications							Material Groups					
										P	M	K	S	H
.008-.027	.043	○	○	●	●	○	●	●	●					
.011-.031	.043	○	●	●	●	○	●	●	●			○	○	○
.008-.047	.071	○	●	●	●	○	●	●	●			○	○	○
.008-.027	.075	○	○	○	○	○	○	○	○	●	●	●	●	○
.008-.020	.102	○	○	○	○	○	○	○	○	●	●	○	○	○

Range of fz (ipt)	Radius for Programming	Applications							Material Groups					
										P	M	K	S	H
.008-.047	.070	○	●	●	●	○	●	●	●	●	●	●	●	○
.008-.027	.075	○	○	○	○	○	○	○	○	●	●	●	●	○
.012-.039	.090	○	○	○	○	○	○	○	○	●	●	●	●	○
.015-.059	.098	●	○	○	○	○	○	○	○	●	●	●	●	○
.008-.020	.102	○	○	○	○	○	○	○	○	●	●	●	●	○
.015-.055	.122	○	○	○	○	○	○	○	○	●	●	●	●	○
.008-.023	.130	○	○	○	○	○	○	○	○	●	●	●	●	○
.008-.031	.161	○	○	○	○	○	○	○	○	●	●	●	●	○

Range of fz (ipt)	Radius for Programming	Applications							Material Groups					
										P	M	K	S	H
.011-.039	.090	○	○	○	●	○	○	○	○	●	●	●	●	○
.015-.059	.098	●	○	○	○	○	○	○	○	●	●	●	●	○
.015-.055	.122	○	○	○	○	○	○	○	○	●	●	●	●	○
.015-.070	.110	○	●	●	●	○	●	●	○	○	○	○	○	○
.015-.078	.122	●	○	○	○	○	○	○	○	●	●	●	●	○
.008-.023	.130	○	○	○	○	○	○	○	○	●	●	●	●	○
.015-.059	.130 & .145 for RM	○	○	○	○	○	○	○	○	●	●	●	●	○
.008-.031	.161	○	○	○	○	○	○	○	○	●	●	●	●	○
.004-.025	.212	●								●	○	○	○	○
.008-.031	.189 & .204 for RM	○	○	○	○	○	○	○	○	●	●	●	●	○

Range of fz (ipt)	Radius for Programming	Applications							Material Groups					
										P	M	K	S	H
.015-.055	.122	○	○	○	○	○	○	○	○	●	●	●	●	○
.015-.070	.110	○	●	●	●	○	●	●	○	○	○	○	○	○
.015-.078	.122	●	○	○	○	○	○	○	○	●	●	●	●	○
.015-.059	.130 & .145 for RM	○	○	○	○	○	○	○	○	●	●	●	●	○
.008-.031	.161	○	○	○	○	○	○	○	○	●	●	●	●	○
.015-.078	.216	●	○	○	○	○	○	○	○	●	●	●	●	○
.004-.025	.212	●								●	○	○	○	○
.008-.031	.189 & .204 for RM	○	○	○	○	○	○	○	○	●	●	●	●	○

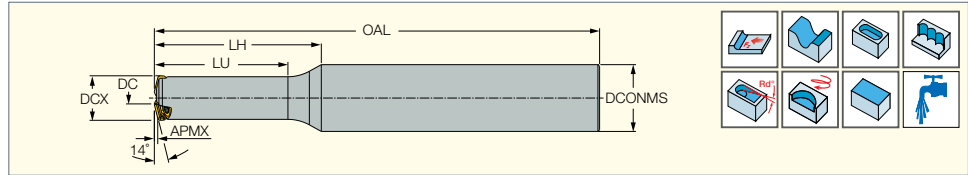
● - Most suitable ○ - Suitable ○ - May be used

<p>T20 Chipformer</p>	<p>T20 - For gray and nodular cast iron</p>	<p>ETR Chipformer</p>	<p>ETR - Tangential insert with reinforced cutting edges for interrupted cut and unfavorable conditions</p>
<p>ER Chipformer</p>	<p>ER - Tangential insert for general applications</p>		



FFT3 EFM-02

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



Designation	DCX	DC	APMX	CICT ⁽¹⁾	LU	LH	OAL	DCONMS	Shank ⁽²⁾	RMPX ⁽³⁾	Lbs
FFT3 EFM D08-2-060-C10-02	.315	.087	.024	2	.67	.787	2.362	.394	C	10.8	.07
FFT3 EFM D08-2-080-C12-02	.315	.087	.024	2	1.02	1.181	3.150	.472	C	10.8	.11
FFT3 EFM D10-3-070-C10-02	.394	.165	.024	3	.77	.787	2.756	.394	C	4.7	.09
FFT3 EFM D10-3-090-C12-02	.394	.165	.024	3	1.18	1.299	3.543	.472	C	4.7	.13

• Radius for programming .043"

⁽¹⁾ Number of inserts

⁽²⁾ C-Cylindrical

⁽³⁾ Maximum ramping angle

Spare Parts

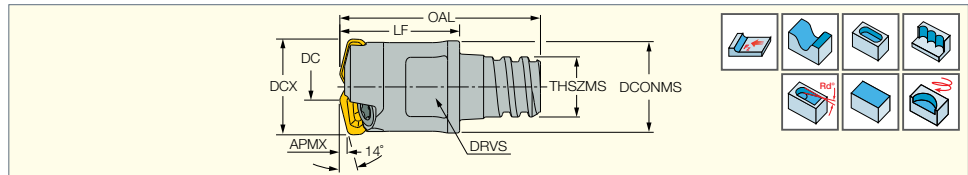
Designation		
FFT3 EFM-02	SR M2X0.4-2.9 T6-HG ^(a)	T-6/5 MAGNET 3X3

^(a) Recommended tightening torque: 4.5 lbt-in



FFT3 EFM-MM 02

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



Designation	DCX	DC	APMX	CICT ⁽¹⁾	LF	DCONMS	THSZMS	OAL	DRVS ⁽²⁾	RMPX ⁽³⁾	Lbs
FFT3 EFM D08/.31-2MMT05-02	.315	.087	.024	2	.394	.299	T05	.659	.217	10.8	.02
FFT3 EFM D10/.39-3MMT06-02	.394	.165	.024	3	.394	.382	T06	.642	.315	4.7	.02

• Radius for programming .043"

⁽¹⁾ Number of inserts

⁽²⁾ Key flat size

⁽³⁾ Maximum ramping angle

Spare Parts

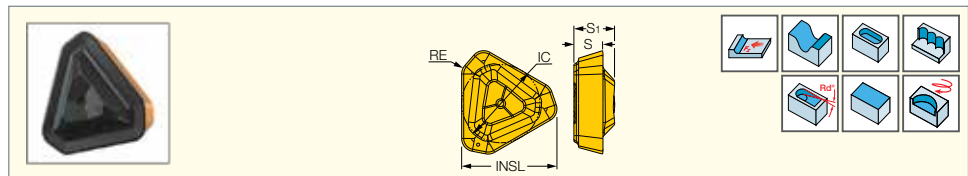
Designation		
FFT3 EFM-MM 02	SR M2X0.4-2.9 T6-HG ^(a)	T-6/5 MAGNET 3X3

^(a) Recommended tightening torque: 4.5 lbt-in



FFT3 TXMT 02

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



Designation	Dimensions					IC830	Recommended Machining Data	
	INSL	IC	RE	S	S ₁		a _p (inch)	f _z (inch/t)
FFT3 TXMT 020105T	.144	.079	.0197	.043	.061	•	.008-.024	.0079-.0276

Recommended Machining Conditions for FFT3-02 Fast Feed Endmills

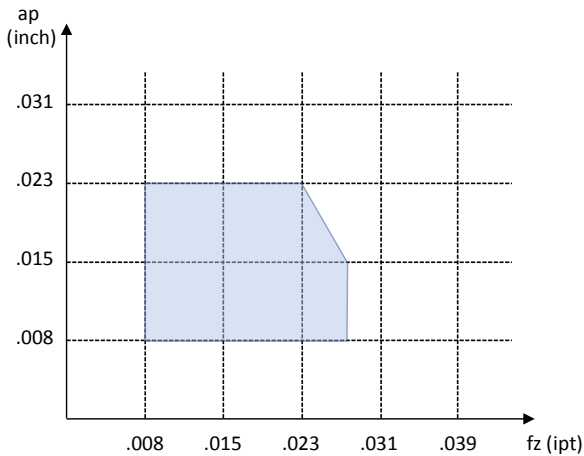
ISO class DIN/ISO 513	Workpiece material					D.O.C. ap [inch]	Cutting speed Vc, [sfm]	Feed fz [ipt]	Coolant
	Description	ISCAR mat. group*	Hardness, HB	Typical representstive					
				AISI/SAE/ASTM	DIN W.-Nr.				
P	Non-alloy steel	1-5	130-180	1020	1.0402	.008-.023	400-660	.008-.027	Dry/Wet
	Low alloy steel	6-8	260-300	4340	1.6582		330-590		Dry/Wet
		9	HRC 35-42**	3135	1.5710		330-430		Dry/Wet
	High alloy steel	10-11	200-220	H13	1.2344		290-490		Dry/Wet
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021		290-490		Dry/Wet

* ISCAR material group in accordance with VDI 3323 standard

** Quenched and tempered

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

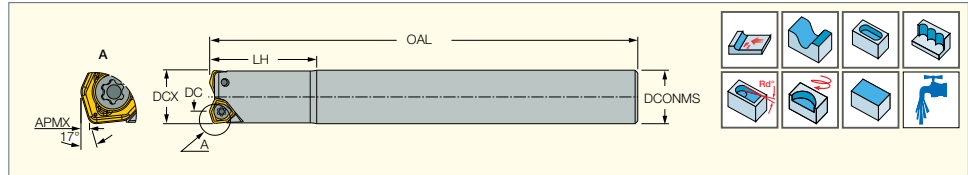
Application Range FFT3-02



MICRO3FEED
MF 300 ENDMILL

FFT3 EFM-03

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



Designation	DCX	DC	APMX	CICT ⁽¹⁾	LH	OAL	DCONMS	Shank ⁽²⁾	RMPX ⁽³⁾	Lbs
FFT3 EFMD.38-2-4.0C.38-03	.375	.200	.024	2	.750	4.000	.375	C	7.5	.08
FFT3 EFMD.50-3-5.0C.50-03	.500	.323	.024	3	1.000	5.000	.500	C	4.0	.24
FFT3 EFMD.62-4-5.5C.62-03	.625	.450	.024	4	1.250	5.500	.625	C	2.5	.40

- Radius for programming .043"
- ⁽¹⁾ Number of inserts
- ⁽²⁾ C-Cylindrical
- ⁽³⁾ Maximum ramping angle

Spare Parts

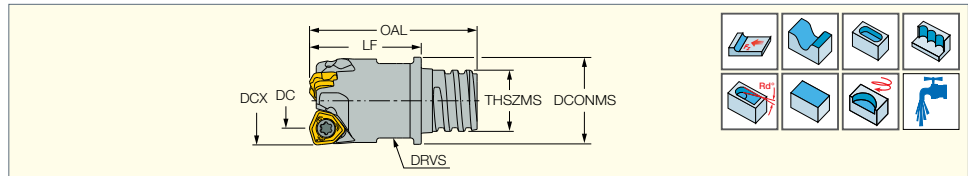
Designation		
FFT3 EFM-03	TS 18041/HG ^(a)	T-6IP/51

^(a) Recommended tightening torque: 4.5 lbt-in

MICRO3FEED
MF 300 ENDMILL

FFT3 EFM-MM 03

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



Designation	DCX	DC	APMX	CICT ⁽¹⁾	LF	DCONMS	THSZMS	OAL	DRVS ⁽²⁾	RMPX ⁽³⁾	Lbs
FFT3 EFMD10/.39-2MMT06-03	.394	.220	.024	2	.394	.382	T06	.642	.315	6.9	.04
FFT3 EFMD12/.47-3MMT08-03	.472	.299	.024	3	.591	.461	T08	.886	.394	4.7	.07
FFT3 EFMD16/.63-4MMT10-03	.630	.457	.024	4	.787	.602	T10	1.232	.512	2.9	.11

- Radius for programming .043"
- ⁽¹⁾ Number of inserts
- ⁽²⁾ Key flat size
- ⁽³⁾ Maximum ramping angle

Spare Parts

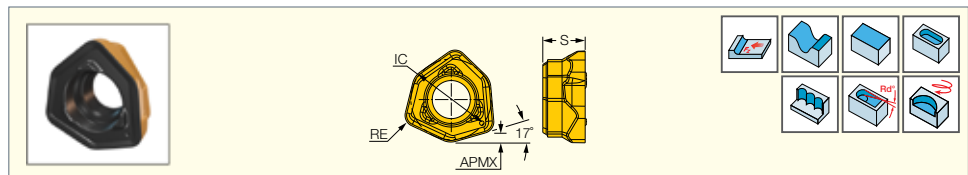
Designation		
FFT3 EFM-MM 03	TS 18041/HG ^(a)	T-6IP/51

^(a) Recommended tightening torque: 4.5 lbt-in

MICRO3FEED
MF 300 ENDMILL

FFT3 WXMT 03

Single-Sided Small Trigon Inserts for Fast Feed Milling



Designation	Dimensions				Tough ↔ Hard		Recommended Machining Data	
	IC	S	RE	APMX	IC830	IC808	a _D (inch)	f _Z (inch/t)
FFT3 WXMT 030206T	.165	.087	.0236	.024	•	•	.008-.024	.0080-.0310

Recommended Machining Conditions for FFT3-03 Fast Feed Endmills

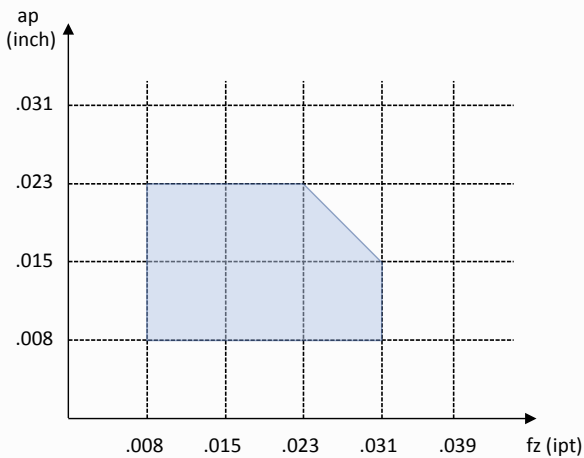
Workpiece material						Carbide grade	D.O.C. ap [inch]	Cutting speed Vc, [sfm]	Feed fz [ipt]	Coolant	
ISO class DIN/ISO 513	Description	ISCAR mat. group*	Hardness, HB	Typical representative							
				AISI/SAE/ASTM	DIN W.-Nr.						
P	Non-alloy steel	1-5	130-180	1020	1.0402	IC808	.008-.024	400-660	.011-.031	Dry/Wet	
						IC830		360-590			
	Low alloy steel	6-8	260-300	4340	1.6582	IC808		330-590	.011-.027	Dry/Wet	
						IC830		300-520			
		9	HRC 35-42**	3135	1.5710	IC808		330-520	.011-.023	Dry/Wet	
						IC830		300-490			
	High alloy steel	10-11	200-220	H13	1.2344	IC808		260-490	.011-.023	Dry/Wet	
						IC830		230-460			
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021	IC808		260-490	.011-.023	Dry/Wet	
						IC830		230-460			
K	Gray cast iron	15-16	250	Class 40	0.6025 (GG25)	IC808	.008-.024	490-660	.011-.023	Dry	
	Nodular cast iron	17-18	200	Class 65-45-12	0.7050 (GGG50)	IC808		460-590	.011-.023		
S	High temperature alloys	33-35	340	Inconel 718	2.4668	IC830	.008-.020	80-130	.008-.015	Wet	
						IC808		80-115	.008-.015		
		36-37	HRC 30-32	AMS R56400	3.7165 (Ti6Al4V ELI)	IC830		100-165	.008-.020		
						IC808		80-150	.008-.020		
H	Hardened steel	38	HRC 45-49	HARDOX 450 plate		IC808	.008-.020	165-245	.008-.015	Dry/Wet	
	Chilled cast iron	40	400	Ni-Hard 1	0.9625			.008-.024	260-330		.008-.020
	Hard cast iron	41	500	A532 IID	0.9645			.008-.020	165-245		.008-.015

* ISCAR material group in accordance with VDI 3323 standard

** Quenched and tempered

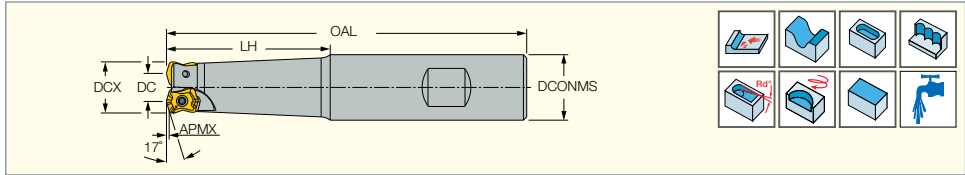
For machining in unstable conditions, the recommended cutting data should be reduced by 20-30%

Application Range FFT3-03



FFX4 ED

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



Designation	DCX	DC	APMX	CICT ⁽¹⁾	LH	OAL	DCONMS	Shank ⁽²⁾	RMPX ⁽³⁾	Lbs
FFX4 ED0.50-1-1.2W0.50-04	.500	.209	.031	1	1.200	3.250	.500	W	3.4	.15
FFX4 ED0.62-2-1.5W0.62-04	.625	.334	.031	2	1.500	3.500	.625	W	4.3	.25
FFX4 ED0.62-2-2.0W0.75-04	.625	.334	.031	2	2.000	4.250	.750	W	4.3	.39
FFX4 ED0.75-3-2.0W0.75-04	.750	.459	.031	3	2.000	4.250	.750	W	2.9	.44
FFX4 ED0.75-3-2.5W0.75-04	.750	.459	.031	3	2.500	5.000	.750	W	2.9	.50
FFX4 ED1.00-4-2.0W1.00-04	1.000	.709	.031	4	2.000	4.500	1.000	W	1.8	.02
FFX4 ED1.00-4-3.0W1.00-04	1.000	.709	.031	4	3.000	5.000	1.000	W	1.8	1.03
FFX4 ED1.25-5-2.5W1.00-04	1.250	.959	.031	5	2.500	5.000	1.000	W	1.2	1.21
FFX4 ED1.25-5-3.0W1.25-04	1.250	.959	.031	5	3.000	5.500	1.250	W	1.2	1.50



• Radius for programming .071"

⁽¹⁾ Number of inserts

⁽²⁾ W - Weldon

⁽³⁾ Maximum ramping angle

Spare Parts

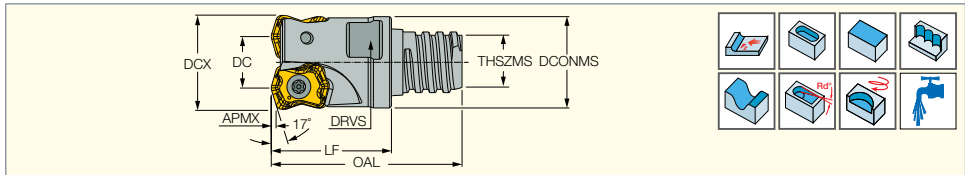
Designation		
FFX4 ED	SR M2.5X6-T7-6 ^(a)	T-7/51

^(a) Recommended tightening torque: 8.0 lbf-in

MULTI-MASTER

FFX4 ED-MM

Endmills with MULTI-MASTER Adaptation Carrying Small "Bone Shape" Inserts with 4 Cutting Edges for Fast Feed Milling



Designation	DCX	DC	CICT ⁽¹⁾	APMX	THSZMS	LF	OAL	RMPX ⁽²⁾	DCONMS	DRVS ⁽³⁾	Lbs
FFX4 ED16/.63-2-MMT10-04	.630	.339	2	.031	T10	.787	1.250	4.3	.598	.511	.05

• Radius for programming .071"

⁽¹⁾ Number of inserts

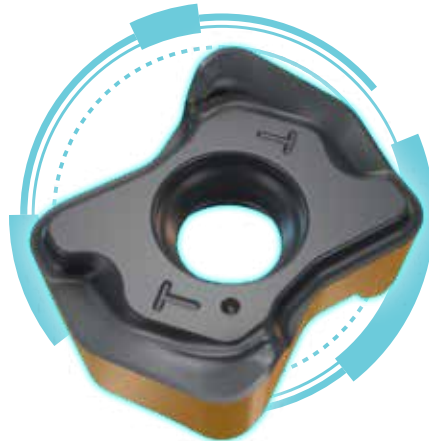
⁽²⁾ Maximum ramping angle

⁽³⁾ Key flat size

Spare Parts

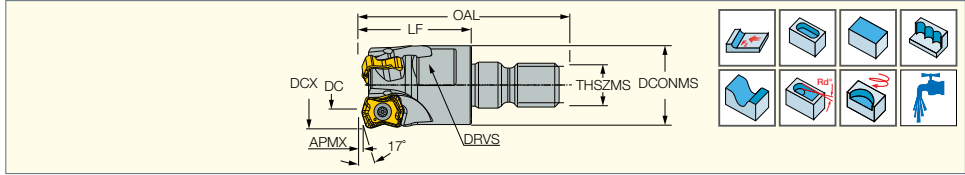
Designation		
FFX4 ED-MM	SR M2.5X6-T7-60 ^(a)	T-7/51

^(a) Recommended tightening torque: 8.0 lbf-in



FFX4 ED-M

Endmills with FLEXFIT Adaptation
Carrying Small "Bone Shape" Inserts with
4 Cutting Edges for Fast Feed Milling



Designation	DCX	DC	CICT ⁽¹⁾	APMX	THSZMS	LF	OAL	RMPX ⁽²⁾	DCONMS	DRVS ⁽³⁾	Lbs
FFX4 ED20/.78-3-M10-04	.787	.496	3	.031	M10	.984	1.772	2.7	.709	.591	.09
FFX4 ED25/.98-4-M12-04	.984	.693	4	.031	M12	1.181	2.047	1.8	.827	.748	.18
FFX4 ED32/1.26-5-M16-04	1.260	.969	5	.031	M16	1.378	2.362	1.2	1.142	1.063	.40
FFX4 ED35/1.38-5-M16-04	1.378	1.087	5	.031	M16	1.378	2.362	1.1	1.142	1.063	.44



• Radius for programming .071"

⁽¹⁾ Number of inserts

⁽²⁾ Maximum ramping angle

⁽³⁾ Key flat size

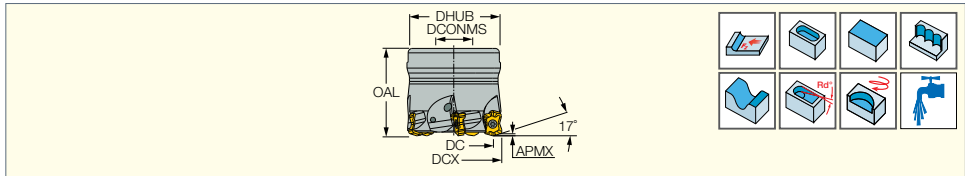
Spare Parts

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

^(a) Recommended tightening torque: 8.0 lbf-in

FFX4 FD

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






Designation	DCX	DC	CICT ⁽¹⁾	APMX	OAL	DHUB	DCONMS	RMPX ⁽²⁾	Lbs
FFX4 FD1.50-6-.50-04	1.500	1.209	6	.031	1.500	1.417	.500	1.0	.51

• Radius for programming .071"

⁽¹⁾ Number of inserts

⁽²⁾ Ramping angle maximum

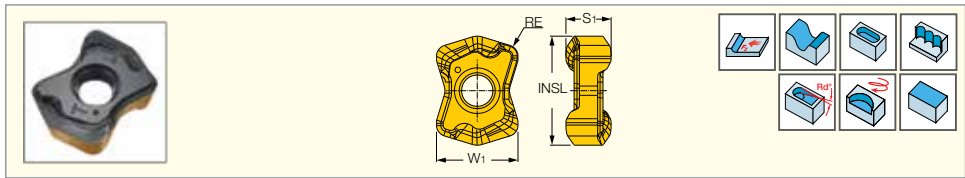
Spare Parts

Designation			
FFX4 FD1.50-6-.50-04	SR UNF 1/4X1 B18.3	T-7/51	SR M2.5X6-T7-60 ^(a)

^(a) Recommended tightening torque: 8.0 lbf-in

FFX4 XNMU

Small "Bone Shape" Inserts with 4 Cutting Edges for Fast Feed Milling



Designation	Dimensions				Tough ↔ Hard						Recommended Machining Data	
	INSL	S ₁	RE	W ₁	IC882	IC840	IC830	IC5820	IC808	IC810	a _p (inch)	f _z (inch/t)
FFX4 XNMU 040310HP	.377	.156	.0394	.282	•	•	•	•	•	•	.008-.031	.0080-.0354
FFX4 XNMU 040310T	.377	.156	.0394	.282			•		•	•	.008-.031	.0080-.0472

• HP- for austenitic stainless steel and high temperature alloys • T- for steel, ferritic and martensitic stainless steel, cast iron and hardened steel

Recommended Machining Conditions for FFX4 Fast Feed Cutters

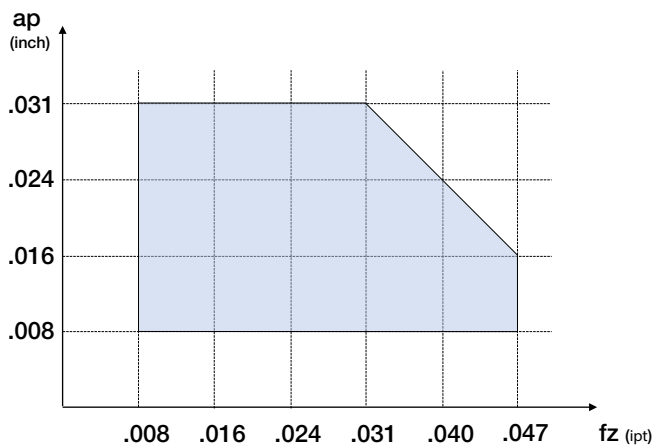
ISO class DIN/ISO 513	Workpiece material					Insert type	Carbide grade	D.O.C. ap [inch]	Cutting speed Vc [sfm]	Feed fz [ipt]	Coolant
	Description	ISCAR mat. group*	Hardness, HB	Typical materials							
				AISI/SAE/ ASTM	DIN W.-Nr.						
P	Non-alloy steel	1-5	130-180	1020	1.0402	T	IC808	.008-.031	500-720	.008-.039	Dry
							IC830		460-660	.008-.047	Dry/Wet
							IC5400		500-820	.008-.035	Dry
	Low alloy steel	6-8	260-300	4340	1.6582		IC808		460-660	.008-.035	Dry/Wet
							IC830		400-600	.008-.043	Dry/Wet
							IC5400		460-720	.008-.031	Dry
		9	HRC 35-42**	3135	1.5710		IC808		430-600	.008-.031	Dry
							IC830		400-530	.008-.039	Dry/Wet
							IC5400		430-620	.008-.027	Dry
	High alloy steel	10-11	200-220	H13	1.2344		IC808		400-560	.008-.031	Dry
							IC830		330-500	.008-.035	Dry/Wet
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021		IC5400		400-600	.008-.027	Dry
							IC808		360-530	.008-.031	Dry
							IC830		330-500	.008-.035	Dry/Wet
M	Austenitic stainless steel	14	200	304L	1.4306	HP	.008-.031	IC830	260-400	.008-.035	Wet
								IC840	260-460	.008-.031	
								IC5820	330-530	.008-.027	
								IC882	260-430	.008-.031	
								K	Gray cast iron	15-16	
Nodular cast iron	17-18	200	Class 65-45-12	0.7050 (GGG50)	IC810	400-660	.015-.047				
S	High temperature alloys	33-35	340	Inconel 718	2.4668	HP	.008-.031	IC882	65-100	.008-.027	Wet
								IC5820	80-115	.008-.023	
								IC840	80-115	.008-.023	
								IC830	80-100	.008-.027	
		36-37	HRC 30-32	AMS R56400	3.7165 (Ti6Al4V ELI)			IC882	80-115	.008-.027	
								IC5820	80-130	.008-.023	
								IC840	80-115	.008-.023	
								IC830	65-100	.008-.027	
H	Hardened steel	38	HRC 45-49	HARDOX 450 plate		T	IC808	.008-.031	160-250	.008-.019	Dry

* ISCAR material group in accordance with VDI 3323 standard

** Quenched and tempered

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

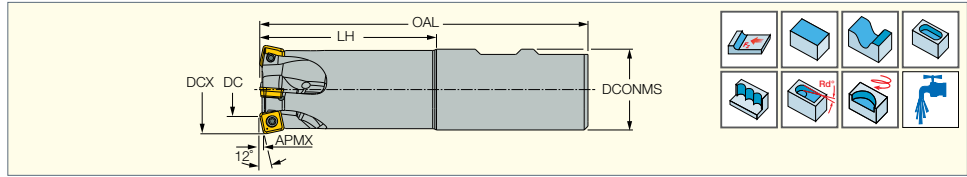
Application Range FFX4



MILL4FEED

FFQ4 D-W-09

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



Designation	DCX	DC	APMX	AE ⁽¹⁾	CICT ⁽²⁾	LH	OAL	DCONMS	RMPX ⁽³⁾	Lbs
FFQ4 D0.87-2-1.7-W0.75-09	.875	.311	.047	.236	2	1.750	3.800	.750	8.0	.39
FFQ4 D1.00-3-2.0-W1.00-09	1.000	.437	.047	.236	3	2.000	4.300	1.000	5.4	.74
FFQ4 D1.25-4-2.5-W1.00-09	1.250	.689	.047	.236	4	2.500	4.800	1.000	3.3	.91
FFQ4 D1.50-5-3.0-W1.25-09	1.500	.938	.047	.236	5	3.000	5.300	1.250	2.2	1.55

• Radius for programming .098"

⁽¹⁾ Plunging width

⁽²⁾ Number of inserts

⁽³⁾ Maximum ramping angle

Spare Parts

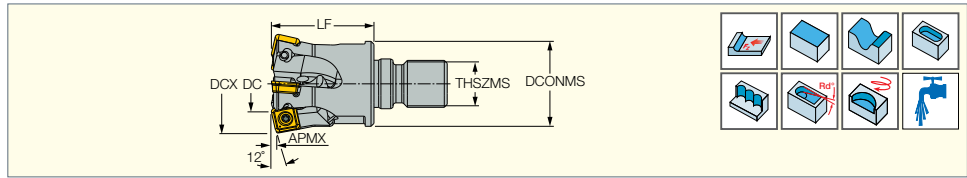
Designation		
FFQ4 D-W-09	SR M3X0.5-L7.4 IP9 ^(a)	IP-9/151

^(a) Recommended tightening torque: 18.0 lbf-in

MILL4FEED

FFQ4 D-M-09

Fast Feed Endmills with FLEXFIT Threaded Adaptation Carrying Single-Sided Inserts with 4 Cutting Edges



Designation	DCX	DC	APMX	AE ⁽¹⁾	CICT ⁽²⁾	LF	OAL	DCONMS	THSZMS	RMPX ⁽³⁾	Lbs
FFQ4 D1.50-05-M16-09	1.500	.933	.047	.236	5	1.400	2.400	1.142	M16	2.3	.39

• Radius for programming .098"

⁽¹⁾ Plunging width

⁽²⁾ Number of inserts

⁽³⁾ Maximum ramping angle

Spare Parts

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

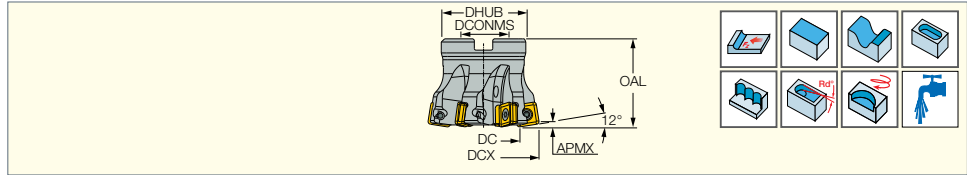
^(a) Recommended tightening torque: 18.0 lbf-in



MILL4FEED

FFQ4 D-09

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



Designation	DCX	DC	APMX	AE ⁽¹⁾	CICT ⁽²⁾	OAL	DCONMS	DHUB	RMPX ⁽³⁾	Lbs
FFQ4 D1.50-05-0.50-09	1.500	.933	.047	.236	5	1.400	.500	1.417	2.2	.38
FFQ4 D2.00-07-0.75-09	2.000	1.439	.047	.236	7	1.600	.750	1.850	1.5	.77
FFQ4 D2.50-08-1.00-09	2.500	1.937	.047	.236	8	1.850	1.000	2.252	1.1	1.38




• Radius for programming .098"

⁽¹⁾ Plunging width

⁽²⁾ Number of inserts

⁽³⁾ Maximum ramping angle

Spare Parts

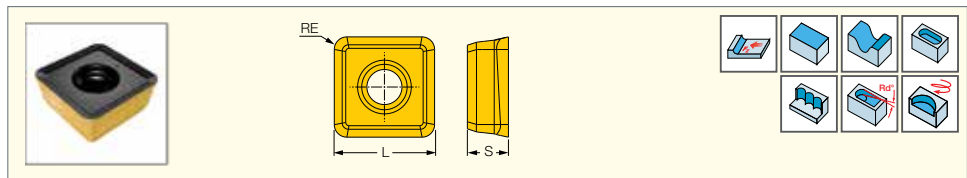
Designation			
FFQ4 D1.50-05-0.50-09	SR M3X0.5-L7.4 IP9 ^(a)	IP-9/151	SR UNF 1/4X1 B18.3
FFQ4 D2.00-07-0.75-09	SR M3X0.5-L7.4 IP9 ^(a)	IP-9/151	SR UNF 3/8X1 B18.3
FFQ4 D2.50-08-1.00-09	SR M3X0.5-L7.4 IP9 ^(a)	IP-9/151	SR UNF 1/2X1 1/4 B18.3

^(a) Recommended tightening torque: 18.0 lbf-in

MILL4FEED

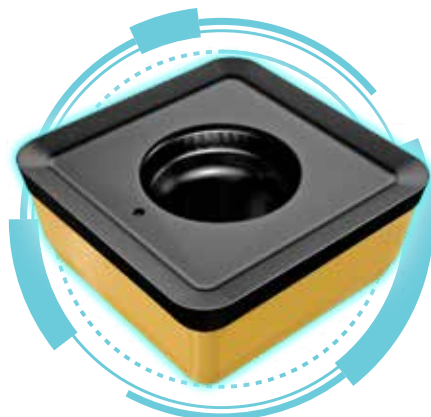
FFQ4 SOMT 0904

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



Designation	Dimensions			Tough ↔ Hard					Recommended Machining Data	
	L	S	RE	IC882	IC830	IC5820	IC808	IC810	a _p (inch)	f _z (inch/t)
FFQ4 SOMT 090412T	.335	.154	.0472		•		•	•	.020-.047	.0157-.0590
FFQ4 SOMT 0904RM-T	.335	.150	.0472		•		•		.020-.047	.0157-.0590
FFQ4 SOMT 090412HP	.335	.150	.0472	•	•	•	•		.020-.047	.0157-.0551

• T - type for steel, ferritic and martensitic stainless steel, cast iron and hardened steel • RM-T type for interrupted cut and machining near straight shoulders on steel, ferritic and martensitic stainless steel, cast iron and hardened steel • HP - type for austenitic stainless steel and high temperature alloys



Recommended Machining Conditions for FFQ4-09 Fast Feed Mills

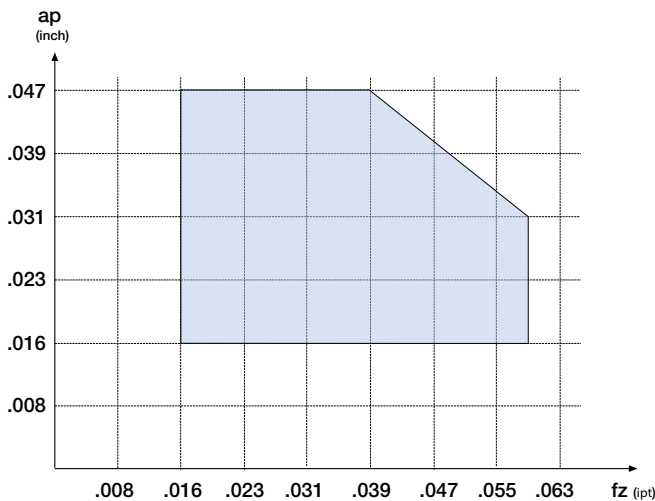
ISO class DIN/ISO 513	Workpiece Material					Insert type	Carbide grade	D.O.C. ap [inch]		Cutting speed Vc [sfm]	Feed fz [ipt]		Coolant
	Description	ISCAR mat. group*	Hardness, HB	Typical materials				Recommended	Range		Recommended	Range	
				AISI/SAE/ASTM	DIN W.-Nr.								
P	Non-alloy steel	1-5	130-180	1020	1.0402	T / RM-T	IC808	.040	.016-.047	490-720	.047	.020-.060	Dry
	Low alloy steel	6-8	260-300	4340	1.6582		IC830			460-660	.050	.020-.060	Dry/Wet
							IC808			460-660	.047	.020-.060	Dry
		9	HRC 35-42**	3135	1.5710		IC830			400-600	.050	.020-.060	Dry/Wet
							IC808			430-590	.047	.020-.055	Dry
							IC830			400-525	.047	.020-.055	Dry/Wet
	High alloy steel	10-11	200-220	H13	1.2344		IC808			400-580	.047	.020-.055	Dry
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021		IC830			330-500	.050	.020-.055	Dry/Wet
							IC808			360-525	.047	.020-.055	Dry
							IC830			330-460	.050	.020-.055	Dry/Wet
M	Austenitic stainless steel	14	200	304L	1.4306	HP	IC830	.040	.016-.047	260-460	.040	.020-.050	Wet
							IC808			330-520	.040	.020-.050	
							IC5820			330-520	.040	.020-.055	
							IC882			260-460	.040	.020-.055	
K	Gray cast iron	15-16	250	Class 40	0.6025 (GG25)	T / RM-T	IC810	.040	.020-.047	490-720	.047	.020-.060	Dry
	Nodular cast iron	17-18	200	Class 65-45-12	0.7050 (GGG50)		IC810			390-660	.047	.020-.060	
S	High temperature alloys	33-35	340	Inconel 718	2.4668	HP	IC882	.040	.016-.047	65-100	.023	.015-.040	Wet
							IC5820			75-115	.023	.020-.040	
							IC830			75-115	.023	.020-.040	
							IC808			80-130	.023	.015-.040	
		36-37	HRC 35-40	AMS R56400	3.7165 (Ti6Al4V ELI)		IC882			65-100	.023	.020-.040	
							IC5820			65-100	.023	.015-.040	
							IC830			65-150	.023	.020-.040	
							IC808			65-100	.023	.020-.040	
H	Hardened steel	38	HRC 45-49	HARDOX 450 plate	T / RM-T	IC808	.040	.020-.047	165-250	.020	.015-.020	Dry	

* ISCAR material group in accordance with VDI 3323 standard

** Quenched and tempered

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

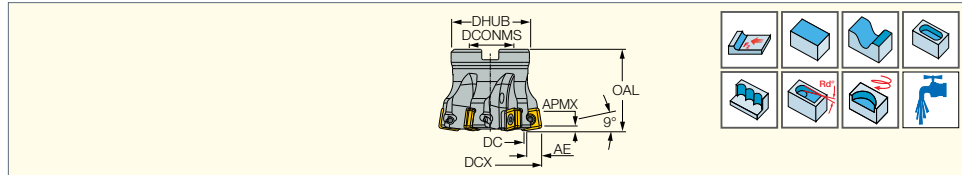
Application Range FFQ4-09





FFQ4 D-12

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



Designation	DCX	DC	APMX	AE ⁽¹⁾	CICT	LF	DHUB	DCONMS	Arbor ⁽²⁾	RMPX	
FFQ4 D2.0-5-0.75-12	2.000	1.136	.059	.394	5	2.000	1.850	.750	A	2.6	.88
FFQ4 D2.5-6-1.00-12	2.500	1.636	.059	.394	6	2.000	2.252	1.000	A	1.7	1.30
FFQ4 D3.0-7-1.00-12	3.000	2.136	.059	.394	7	2.000	2.252	1.000	A	1.3	1.72
FFQ4 D4.0-8-1.50-12	4.000	3.136	.059	.394	8	2.000	3.228	1.500	B	.9	2.92
FFQ4 D5.0-10-1.50-12	5.000	4.110	.059	.394	10	2.000	3.799	1.500	B	.7	5.51

• Radius for programming .122" ⁽¹⁾ Plunging width

Spare Parts

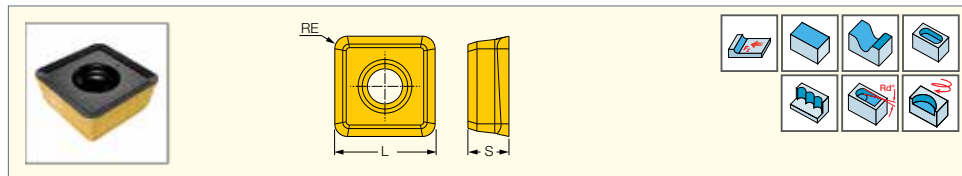
Designation				
FFQ4 D2.0-5-0.75-12	SR M4X0.7-L9.6 IP15 ^(a)	SW6-T	BLD IP15/S7	SR UNF 3/8X1.5 B18.3
FFQ4 D2.5-6-1.00-12	SR M4X0.7-L9.6 IP15 ^(a)	SW6-T	BLD IP15/S7	SR UNF 1/2X1 1/4 B18.3
FFQ4 D3.0-7-1.00-12	SR M4X0.7-L9.6 IP15 ^(a)	SW6-T	BLD IP15/S7	SR UNF 1/2X1 1/4 B18.3
FFQ4 D4.0-8-1.50-12	SR M4X0.7-L9.6 IP15 ^(a)	SW6-T	BLD IP15/S7	
FFQ4 D5.0-10-1.50-12	SR M4X0.7-L9.6 IP15 ^(a)	SW6-T	BLD IP15/S7	

^(a) Recommended tightening torque: 42.5 lbf-in



FFQ4 SOMT 1205

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



Designation	Dimensions			Tough ↔ Hard					Recommended Machining Data	
	L	S	RE	IC882	IC830	IC5820	IC808	IC810	a _p (inch)	f _z (inch/t)
FFQ4 SOMT 1205RM-HP	.500	.205	.063		•				.020-.059	.0157-.0709
FFQ4 SOMT 1205RM-T	.500	.205	.063				•		.020-.059	.0157-.0787
FFQ4 SOMT 120516HP	.500	.205	.063	•	•	•	•		.020-.059	.0157-.0709
FFQ4 SOMT 120516T	.500	.205	.063		•		•		.020-.059	.0157-.0787
FFQ4 SOMT 120516T20	.500	.205	.063					•	.020-.059	.0157-.0787

• RM-HP- for interrupted cut and machining next to shoulders of austenitic stainless steel and high temperature alloys • RM-T- for interrupted cut and machining next to shoulders of steel, ferritic and martensitic stainless steel, cast iron and hardened steel • HP- for austenitic stainless steel and high temperature alloys
• T- for steel, ferritic and martensitic stainless steel, cast iron and hardened steel • T20- for gray and nodular cast iron



Recommended Machining Conditions for FFQ4-12 Fast Feed Face Mills

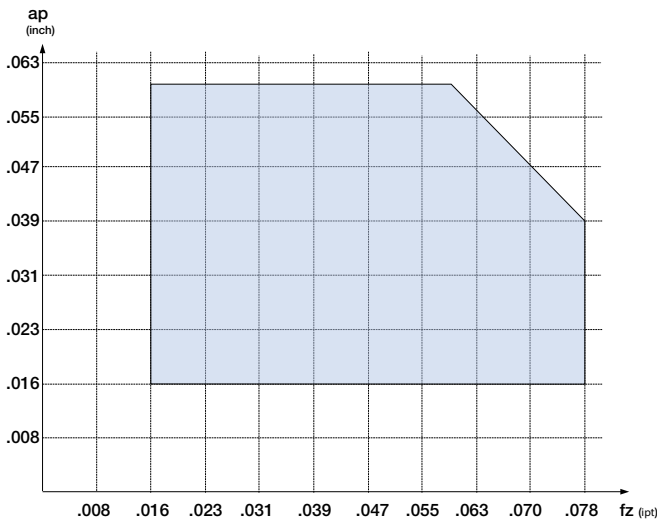
ISO class DIN/ISO 513	Description	Workpiece Material				Insert type	Carbide grade	D.O.C. ap [inch]	Cutting speed Vc, [sfm]	Feed fz [ipt]	Coolant
		ISCAR mat. group*	Hardness, HB	Typical material							
				AISI/SAE/ ASTM	DIN W.-Nr.						
P	Non-alloy steel	1-5	130-180	1020	1.0402	T	IC808	.020-.059	490-720	.059 (.020- .080)	Dry
	Low alloy steel	6-8	260-300	4340	1.6582		IC830		460-660	.063 (.020- .080)	Dry/Wet
							IC808		460-660	.059 (.020- .080)	Dry
		9	HRC 35-42**	3135	1.5710		IC830		390-590	.063 (.020- .080)	Dry/Wet
							IC808		430-590	.059 (.020- .070)	Dry
	High alloy steel	10-11	200-220	H13	1.2344		IC830		390-520	.059 (.020- .070)	Dry/Wet
							IC808		390-560	.051 (.020- .070)	Dry
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021		IC830		330-490	.055 (.020- .070)	Dry/Wet
IC808						360-520	.051 (.020- .070)	Dry			
M	Austenitic stainless steel	14	200	304L	1.4306	HP	.020-.059	IC830	260-460	.039 (.020- .060)	Wet
								IC808	330-520	.039 (.020- .060)	
								IC5820	330-520	.039 (.020- .060)	
								IC882	260-430	.039 (.020- .070)	
K	Grey cast iron	15-16	250	Class 40	0.6025 (GG25)	T20	.020-.059	IC810	490-720	.059 (.020- .080)	Dry
	Nodular cast iron	17-18	200	Class 65-45-12	0.7050 (GGG50)			IC810	390-660	.059 (.020- .080)	
S	High temperature alloys	33-35	340	Inconel 718	2.4668	HP	.020-.059	IC830	75-115	.028 (.020- .040)	Wet
								IC808	80-130	.028 (.016- .020)	
								IC5820	75-115	.028 (.020- .040)	
								IC882	65-100	.028 (.020- .040)	
		36-37	HRC 35-40	AMS R56400	3.7165 (Ti6Al4V)			IC830	65-150	.028 (.020- .040)	
								IC808	65-100	.028 (.016- .020)	
								IC5820	65-100	.028 (.020- .040)	
								IC882	65-100	.035 (.020- .040)	
H	Hardened steel	38	HRC 45-49	HARDOX 450 plate		T	IC808	.020-.059	160-250	.020 (.016- .020)	Dry

* ISCAR material group in accordance with VDI 3323 standard

** Quenched and tempered

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

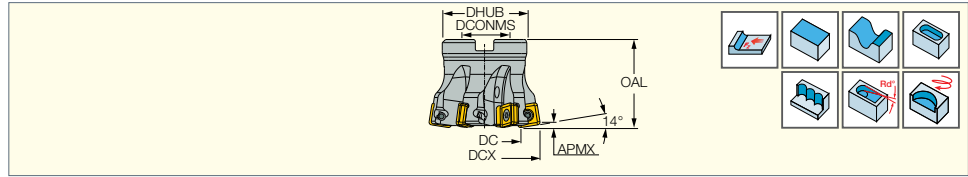
Application Range FFQ4-12



MILL4FEED

FFQ4 D-17

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



Designation	DCX	DC	APMX	AE ⁽¹⁾	CICT ⁽²⁾	OAL	DCONMS	DHUB	RMPX ⁽³⁾		
FFQ4 D3.00-06-1.25-17	3.000	1.850	.118	.512	6	2.000	1.250	2.874	1.2	Y	1.79
FFQ4 D4.00-07-1.50-17	4.000	2.850	.118	.512	7	2.000	1.500	3.228	.8	Y	2.91
FFQ4 D5.00-08-1.50-17	5.000	3.850	.118	.512	8	2.250	1.500	3.228	.6	Y	4.44
FFQ4 D6.00-10-2.00-17	6.000	4.850	.118	.512	10	2.500	2.000	5.000	.4	N	9.81

• Radius for programming .217"

⁽¹⁾ Plunging width

⁽²⁾ Number of inserts

⁽³⁾ Maximum ramping angle

Spare Parts

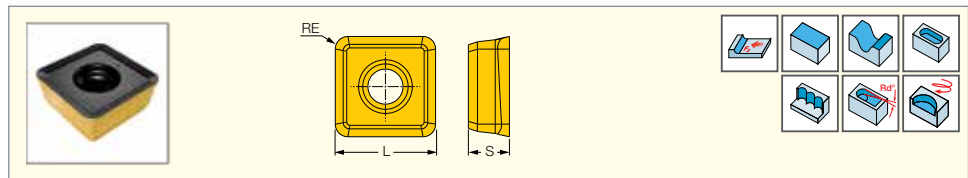
Designation			
FFQ4 D-17	SR M5-14 IP20 ^(a)	BLD IP20/S7	SW6-T

^(a) Recommended tightening torque: 80.0 lbf-in

MILL4FEED

FFQ4 SOMT 1706

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



Designation	Dimensions			Tough ↔ Hard				Recommended Machining Data	
	L	S	RE	IC882	IC830	IC808	IC810	a _p (inch)	f _z (inch/t)
FFQ4 SOMT 1706RM-T ⁽¹⁾	.689	.236	.0984			•		.047-.118	.0157-.0787
FFQ4 SOMT 170625HP ⁽²⁾	.689	.236	.0984	•	•	•		.047-.118	.0157-.0590
FFQ4 SOMT 170625T ⁽³⁾	.689	.236	.0984		•	•	•	.047-.118	.0157-.0787

⁽¹⁾ For interrupted cut and machining next to shoulders on steel, stainless steel, cast iron and hardened steel

⁽²⁾ For austenitic stainless steel and high temperature alloys

⁽³⁾ For steel, ferritic and martensitic stainless steel, cast iron and hardened steel



Recommended Machining Conditions for FFQ4-17 Fast Feed Mills

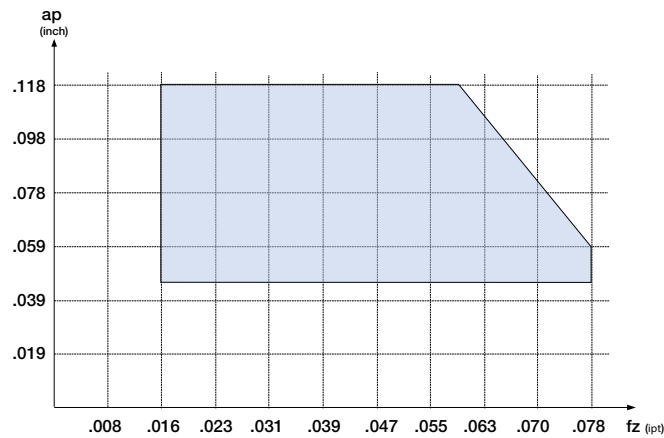
ISO class DIN/ISO 513	Description	Workpiece material				Insert type	Carbide grade	D.O.C. ap [inch]	Cutting speed Vc [sfm]	Feed fz [ipt]	Coolant					
		ISCAR mat. group*	Hardness, HB	Typical material												
				AISI/SAE/ASTM	DIN W.-Nr.											
P	Non-alloy	1-5	130-180	1020	1.0402	T / RM-T	IC808 IC830 IC808 IC830 IC808 IC830 IC808 IC830	.047-.118	490 - 720	.020 - .059	Dry					
									460 - 655	.020 - .059	Dry/Wet					
	Low alloy steel	6-8	260-300	4340	1.6582				460 - 655	.020 - .059	Dry					
									395 - 590	.020 - .059	Dry/Wet					
	High alloy	10-11	200-220	H13	1.2344				425 - 590	.020 - .059	Dry					
									395 - 525	.020 - .059	Dry/Wet					
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021				330 - 490	.020 - .059	Dry					
									330 - 490	.020 - .059	Dry/Wet					
M	Austenitic stainless steel	14	200	304L	1.4306	HP	IC830 IC808 IC882	.047-.118	260 - 460	.020 - .047	Wet					
									330 - 525	.020 - .047						
									260 - 525	.020 - .047						
K	Gray cast iron	15-16	250	Class 40	0.6025 (GG25)	T	IC810 IC810	.047-.118	490 - 720	.020 - .079	Dry					
	Nodular cast iron	17-18	200	Class 65-45-12	0.7050 (GGG50)				395 - 655	.020 - .079						
S	High temperature alloys	33-35	340	Inconel 718	2.4668	HP	IC830 IC808 IC882 IC830 IC808 IC882	.047-.118	80 - 115	.012 - .031	Wet					
									36-37	HRC 30-32		AMS R56400	3.717 (Ti6Al4V ELI)	80 - 130	.012 - .031	
														75 - 100	.012 - .031	
		80 - 150	.012 - .031													
		Hardened steel	38	HRC 45-49	HARDOX 450 plate				T / RM-T	IC808		.047-.118	165 - 245	.012 - .024	Dry	

* ISCAR material group in accordance with VDI 3323 standard

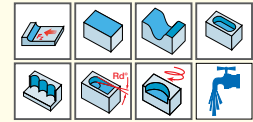
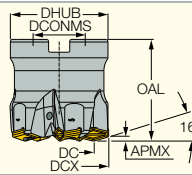
** Quenched and tempered

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

Application Range FFQ4-17



FFV-D-R-VN07
Fast Feed Shell Mill Carrying
Tangentially Clamped Inserts
with 4 Cutting Edges







Designation	DCX	DC	APMX	CICT ⁽¹⁾	OAL	DCONMS	DHUB	RMPX ⁽²⁾	Arbor	Lbs
FFV D2.0-05-.75-R-VN07	2.000	1.417	.059	5	2.000	.750	1.850	3.1	A	1.01
FFV D2.5-06-1.0-R-VN07	2.500	1.890	.059	6	1.750	1.000	2.252	2.2	A	1.35
FFV D3.0-07-1.0-R-VN07	3.000	2.402	.059	7	2.000	1.000	2.252	1.5	B	1.63
FFV D4.0-08-1.5-R-VN07	4.000	3.386	.059	8	2.000	1.500	3.228	1.2	B	3.43

• Radius for programming .110"

⁽¹⁾ Number of inserts

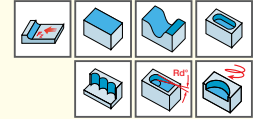
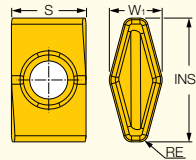
⁽²⁾ Maximum ramping angle

Spare Parts

Designation				
FFV D2.0-05-.75-R-VN07	SR M4X0.7-L11.5 IP15 ^(a)	BLD IP15/S7	SW6-T-SH	SR UNF 3/8X1 B18.3
FFV D2.5-06-1.0-R-VN07	SR M4X0.7-L11.5 IP15 ^(a)	BLD IP15/S7	SW6-T-SH	SR UNF 1/2X20X1 B18.3
FFV D3.0-07-1.0-R-VN07	SR M4X0.7-L11.5 IP15 ^(a)	BLD IP15/S7	SW6-T-SH	
FFV D4.0-08-1.5-R-VN07	SR M4X0.7-L11.5 IP15 ^(a)	BLD IP15/S7	SW6-T-SH	

^(a) Recommended tightening torque: 46.0 lbf-in

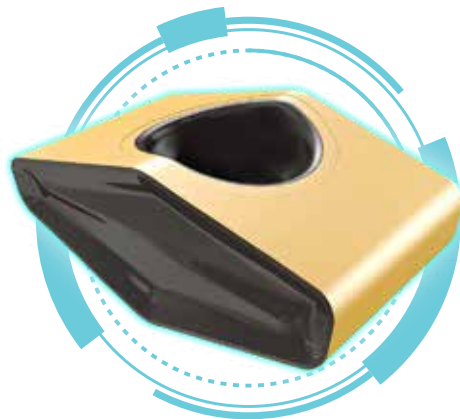
FF VNMT 0706
Tangentially Clamped Inserts with 4
Cutting Edges for Fast Feed Milling



Designation	Dimensions				Tough ↔ Hard								Recommended Machining Data		
	W ₁	INSL	RE	S	IC882	IC845	IC840	IC830	IC5820	IC5400	IC5500	IC808	IC810	a _p (inch)	f _z (inch/t)
FF VNMT 0706ZN-ER ⁽¹⁾	.252	.591	.0394	.356	•	•	•	•	•	•	•	•	•	.020-.059	.0157-.0709
FF VNMT 0706ZN-ETR ⁽²⁾	.252	.591	.0394	.356				•			•	•	•	.020-.059	.0157-.0709

⁽¹⁾ For general applications

⁽²⁾ Reinforced cutting edges for interrupted cut and unfavorable conditions



Recommended Machining Conditions for FFV-07 Fast Feed Cutters

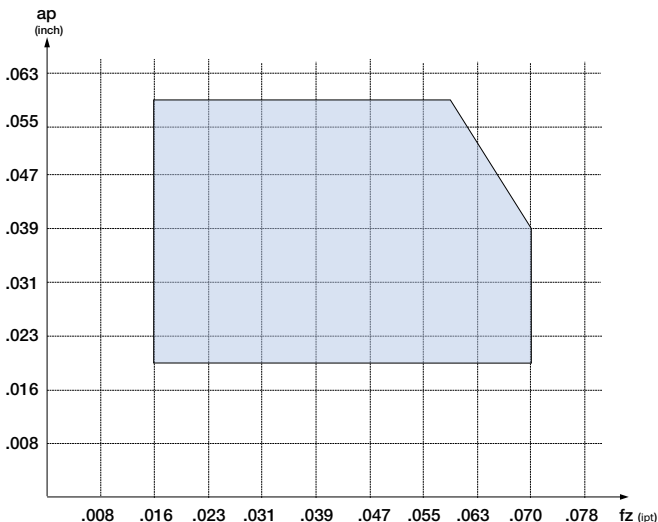
ISO class DIN/ISO 513	Workpiece material					Insert type	Carbide grade	D.O.C. ap [inch]	Cutting speed Vc [sfm]	Feed fz [ipt]	Coolant
	Description	ISCAR mat. group*	Hardness, HB	Typical material							
				AISI/SAE/ ASTM	DIN W.-Nr.						
P	Non-alloy steel	1-5	130-180	1020	1.0402	ER / ETR	IC808	.020-.059	490-720	.020-.051	Dry
							IC830		460-660	.023-.063	Dry/Wet
							IC845		430-590	.027-.070	Dry/Wet
	IC5400	490-820	.020-.043	Dry							
	Low alloy steel	6-8	260-300	4340	1.6582		IC808		460-660	.020-.047	Dry
							IC830		400-590	.020-.059	Dry/Wet
							IC845		330-520	.023-.063	Dry/Wet
		9	HRC 35-42**	3135	1.5710		IC5400		460-720	.020-.051	Dry
							IC808		430-590	.020-.047	Dry
							IC830		400-520	.020-.055	Dry/Wet
	High alloy steel	10-11	200-220	H13	1.2344		IC845		330-490	.020-.059	Dry/Wet
							IC5400		430-620	.020-.043	Dry
							IC808		400-560	.020-.047	Dry
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021		IC830		330-490	.020-.051	Dry/Wet
							IC845		330-490	.020-.059	Dry/Wet
							IC5400		430-620	.020-.043	Dry
IC808						360-520	.020-.047	Dry			
M	Austenitic stainless steel	14	200	304L	1.4306	ER	.020-.059	IC840	260-460	.015-.023	Wet
								IC830	260-400	.015-.027	
								IC882	260-430	.015-.035	
								IC5820	330-520	.015-.031	
								IC808	330-520	.015-.027	
K	Gray cast iron	15-16	250	Class 40	0.6025 (GG25)	ER / ETR	.020-.059	IC810	490-720	.020-.070	Dry
	Nodular cast iron	17-18	200	Class 65-45-12	0.7050 (GGG50)			IC810	400-660	.020-.070	
S	High temperature alloys	33-35	340	Inconel 718	2.4668	ER	.020-.059	IC808	80-130	.015-.023	Wet
								IC840	80-115	.015-.020	
								IC882	65-100	.015-.031	
								IC5820	80-115	.015-.027	
								IC830	65-100	.015-.023	
	36-37	HRC 30-32	AMS R56400	3.7165 (Ti6Al4V ELI)	IC808			100-200	.015-.027		
					IC840			80-115	.015-.023		
					IC882			80-115	.015-.035		
					IC5820			65-100	.015-.031		
					IC830			65-100	.015-.027		
H	Hardened steel	38.1	HRC 45-49	HARDOX 450 plate		ETR	IC808	.020-.059	245-290	.015-.031	Dry

* ISCAR material group in accordance with VDI 3323 standard

** Quenched and tempered

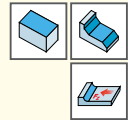
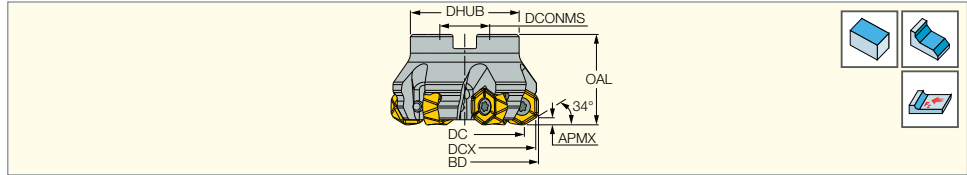
For machining in unstable conditions, the recommended cutting data should be reduced by 20-30%

Application Range FFV-07



MF FHX-R06

34° Face Mills Carrying Hexagonal Inserts with 12 Cutting Edges



Designation	DCX	BD	DC	CICT	APMX	OAL	DHUB	DCONMS	Arbor ⁽¹⁾		
MF FHX D2.50-06-1.00-R06	2.500	2.590	2.120	6	.118	1.750	2.250	1.000	A	Y	1.31
MF FHX D3.00-07-1.25-R06	3.000	3.090	2.620	7	.118	1.750	2.750	1.250	A	Y	1.94
MF FHX D4.00-09-1.50-R06	4.000	4.090	3.620	9	.118	2.000	3.250	1.500	B	Y	3.37
MF FHX D5.00-11-1.50-R06	5.000	5.090	4.620	11	.118	2.000	3.500	1.500	B	Y	5.36
MF FHX D6.00-13-2.00-R06	6.000	6.090	5.620	13	.118	2.250	4.000	2.000	B	N	7.67

• Radius for programming according to D1 diameter is .213" • When machining next to shoulders, maximum width of cut should be 0.3xD

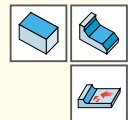
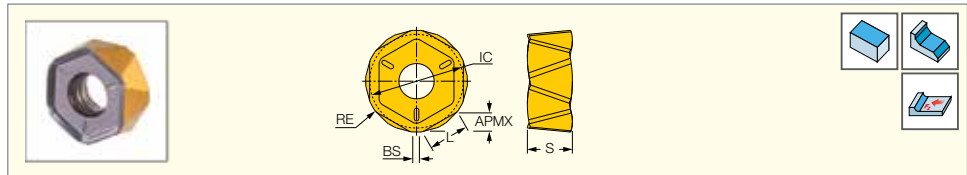
Spare Parts

Designation				
MF FHX D2.50-06-1.00-R06	SR 14-591/H ^(a)	BLD T20/S7	SW6-T	SR UNF 1/2X20X1 B18.3
MF FHX D3.00-07-1.25-R06	SR 14-591/H ^(a)	BLD T20/S7	SW6-T	SR UNF 5/8X1 B18.3
MF FHX D4.00-09-1.50-R06	SR 14-591/H ^(a)	BLD T20/M7	SW6-T	
MF FHX D5.00-11-1.50-R06	SR 14-591/H ^(a)	BLD T20/M7	SW6-T	
MF FHX D6.00-13-2.00-R06	SR 14-591/H ^(a)	BLD T20/M7	SW6-T	

^(a) Recommended tightening torque: 80.0 lbf-in

H1200 HXCU 0606

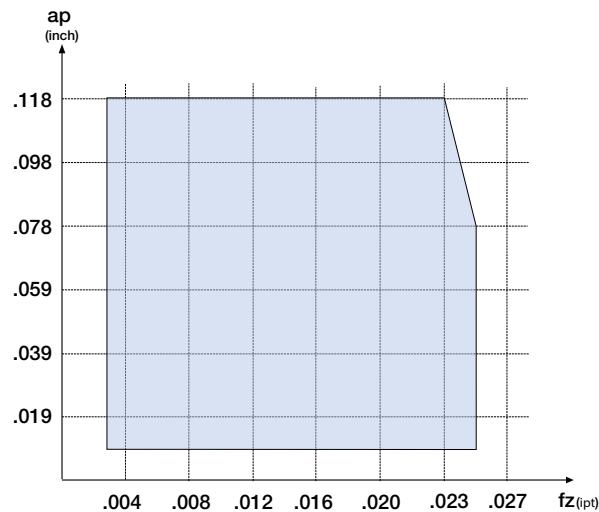
Double-Sided Hexagonal Inserts with 12 Cutting Edges



Designation	Dimensions						Tough ↔ Hard						Recommended Machining Data	
	APMX	L	BS	RE	IC	S	IC845	IC840	IC830	IC5500	IC808	IC810	a_p (inch)	f_z (inch/t)
H1200 HXCU 0606-HPR	.118	.253	.042	.063	.586	.281	•	•	•	•	•	•	.008-.118	.0031-.0157
H1200 HXCU 0606-TR	.118	.253	.042	.063	.586	.281	•	•	•	•	•	•	.008-.118	.0098-.0256

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

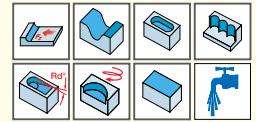
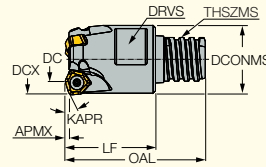
Application Range MF FHX-R06



HELI 6 FEED
UPFEED LINE
MULTI-MASTER

FF EWX-MM

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



Designation	DCX	DC	APMX	CICT	THSZMS	LF	OAL	DHUB	DRVS ⁽¹⁾	RMPX	
FF EWX D0.62-2-MMT10-04	.630	.330	.031	2	T10	.750	1.210	.600	.500	5.0	.05
FF EWX D16-2-MMT10-04	.630	.339	.031	2	T10	.768	1.230	.598	.472	5.0	.05
FF EWX D0.75-3-MMT12-04	.750	.460	.031	3	T12	1.000	1.540	.720	.600	5.0	.10
FF EWX D25-4-MMT15-04	.984	.693	.031	4	T15	1.181	1.850	.941	.748	3.3	.21
FF EWX D25-3-MMT15-05	.984	.591	.039	3	T15	1.181	1.850	.941	.748	5.0	.20

• Do not apply lubricant to the MULTI-MASTER threaded connection. ⁽¹⁾ Width across flats (wrench should be ordered separately)

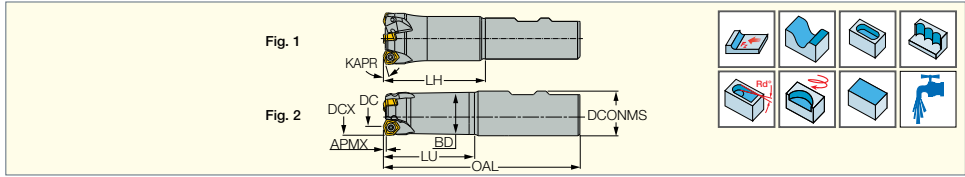
Spare Parts

Designation		
FF EWX D0.62-2-MMT10-04	SR M2.5X6-T7-60	T-7/51
FF EWX D16-2-MMT10-04	SR M2.5X6-T7-60	T-7/51
FF EWX D0.75-3-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

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



Designation	DCX	DC	APMX	CICT	LU	LH	OAL	BD	DCONMS	Shank ⁽¹⁾	RMPX	Fig.	Lbs
FF EWXD0.62-2-1.5W0.62-04	.625	.333	.030	2	1.50	1.600	3.550	.580	.625	W	5.0	2.	.25
FF EWXD0.62-2-2.0W0.75-04	.625	.333	.030	2	2.00	2.250	4.350	.580	.750	W	5.0	2.	.38
FF EWXD0.62-2-3.0W0.75-04	.625	.333	.030	2	3.00	3.250	5.350	.580	.750	W	5.0	2.	.48
FF EWXD0.75-3-1.5W0.75-04	.750	.458	.030	3	1.50	1.600	3.650	.700	.750	W	5.0	2.	.37
FF EWXD0.75-3-2.5W0.75-04	.750	.458	.030	3	2.50	2.600	4.650	.700	.750	W	5.0	2.	.47
FF EWXD0.75-3-3.5W0.75-04	.750	.458	.030	3	3.50	3.600	5.650	.700	.750	W	5.0	2.	.57
FF EWXD1.00-3-2.0W1.00-05	1.000	.610	.043	3	2.00	2.120	4.450	.950	1.000	W	5.0	2.	.82
FF EWXD1.00-3-3.0W1.00-05	1.000	.610	.043	3	3.00	3.120	5.450	.950	1.000	W	5.0	2.	.99
FF EWXD1.00-3-5.0W1.00-05	1.000	.610	.043	3	5.00	5.120	7.450	.950	1.000	W	5.0	2.	1.35
FF EWXD1.25-4-2.5W1.00-05	1.250	.860	.043	4	2.50	2.620	4.950	1.078	1.000	W	4.0	1.	1.04
FF EWXD1.25-4-2.5W1.25-05	1.250	.860	.043	4	2.50	2.620	4.950	1.200	1.250	W	4.0	2.	1.39
FF EWXD1.25-4-4.0W1.00-05	1.250	.860	.043	4	4.00	4.120	6.450	1.078	1.000	W	4.0	1.	1.39
FF EWXD1.25-4-4.0W1.25-05	1.250	.860	.043	4	4.00	4.120	6.450	1.200	1.250	W	4.0	2.	1.80
FF EWXD1.25-4-6.0W1.25-05	1.250	.860	.043	4	6.00	6.120	8.450	1.200	1.250	W	4.0	2.	2.33
FF EWXD1.50-5-2.5W1.25-05	1.500	1.110	.043	5	2.50	2.620	4.950	1.328	1.250	W	3.0	1.	1.54
FF EWXD1.50-5-4.0W1.25-05	1.500	1.110	.043	5	4.00	4.120	6.450	1.328	1.250	W	3.0	1.	2.06
FF EWXD1.50-5-6.0W1.25-05	1.500	1.110	.043	5	6.00	6.120	8.450	1.328	1.250	W	3.0	1.	2.78
FF EWXD1.50-5-7.5W1.50-05	1.500	1.110	.043	5	7.50	7.620	10.350	1.450	1.500	W	3.0	2.	4.06
FF EWXD1.25-3-2.5W1.25-07	1.250	.740	.059	3	2.50	2.620	4.950	1.200	1.250	W	6.3	2.	1.28
FF EWXD1.25-3-4.0W1.25-07	1.250	.740	.059	3	4.00	4.120	6.450	1.200	1.250	W	6.3	2.	1.66
FF EWXD1.25-3-6.0W1.25-07	1.250	.740	.059	3	6.00	6.120	8.450	1.200	1.250	W	6.3	2.	2.16
FF EWXD1.50-4-2.5W1.25-07	1.500	.990	.059	4	2.50	2.590	4.950	1.330	1.250	W	4.6	1.	1.30
FF EWXD1.50-4-4.0W1.25-07	1.500	.990	.059	4	4.00	4.090	6.450	1.330	1.250	W	4.6	1.	2.04

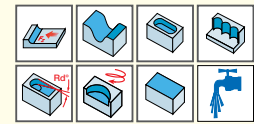
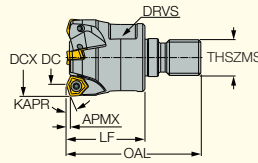
• For machining recommendations and radius for programming, refer to information of related insert. ⁽¹⁾ W-Weldon

Spare Parts

Designation				
FF EWXD0.62-2-1.5W0.62-04	SR M2.5X6-T7-60	T-7/51		
FF EWXD0.62-2-2.0W0.75-04	SR M2.5X6-T7-60	T-7/51		
FF EWXD0.62-2-3.0W0.75-04	SR M2.5X6-T7-60	T-7/51		
FF EWXD0.75-3-1.5W0.75-04	SR M2.5X6-T7-60	T-7/51		
FF EWXD0.75-3-2.5W0.75-04	SR M2.5X6-T7-60	T-7/51		
FF EWXD0.75-3-3.5W0.75-04	SR M2.5X6-T7-60	T-7/51		
FF EWXD1.00-3-2.0W1.00-05	SR 10508600	T-9/51		
FF EWXD1.00-3-3.0W1.00-05	SR 10508600	T-9/51		
FF EWXD1.00-3-5.0W1.00-05	SR 10508600	T-9/51		
FF EWXD1.25-4-2.5W1.00-05	SR 10508600	T-9/51		
FF EWXD1.25-4-2.5W1.25-05	SR 10508600	T-9/51		
FF EWXD1.25-4-4.0W1.00-05	SR 10508600	T-9/51		
FF EWXD1.25-4-4.0W1.25-05	SR 10508600	T-9/51		
FF EWXD1.25-4-6.0W1.25-05	SR 10508600	T-9/51		
FF EWXD1.50-5-2.5W1.25-05	SR 10508600	T-9/51		
FF EWXD1.50-5-4.0W1.25-05	SR 10508600	T-9/51		
FF EWXD1.50-5-6.0W1.25-05	SR 10508600	T-9/51		
FF EWXD1.50-5-7.5W1.50-05	SR 10508600	T-9/51		
FF EWXD1.25-3-2.5W1.25-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
FF EWXD1.25-3-4.0W1.25-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
FF EWXD1.25-3-6.0W1.25-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
FF EWXD1.50-4-2.5W1.25-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
FF EWXD1.50-4-4.0W1.25-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH

FF EWX-M

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



Designation	DCX	DC	APMX	CICT	LF	OAL	THSZMS	RMPX	Lbs	DRVS ⁽¹⁾
FF EWX D20-3-M10-04	.787	.496	.031	3	.984	1.772	M10	4.8	.10	.591
FF EWX D25-4-M12-04	.984	.693	.031	4	1.181	2.047	M12	3.3	.20	.748
FF EWX D25-3-M12-05	.984	.591	.039	3	1.181	2.047	M12	5.0	.19	.748
FF EWX D32-4-M16-05	1.260	.866	.039	4	1.378	2.362	M16	4.0	.38	.984
FF EWX D35-4-M16-05	1.378	.984	.039	4	1.378	2.362	M16	3.5	.42	.984
FF EWX D40-5-M16-05	1.575	1.181	.039	5	1.575	2.559	M16	2.8	.57	.984
FF EWX D32-3-M16-07	1.260	.748	.059	3	1.378	2.362	M16	6.3	.35	.984
FF EWX D40-4-M16-07	1.575	1.063	.059	4	1.575	2.559	M16	4.2	.52	.984

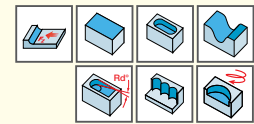
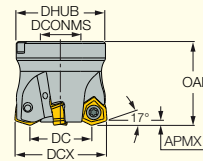
⁽¹⁾ Clamping wrench size

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	
FF EWX D40-4-M16-07	SR 34-535-SN	

FF FWX

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

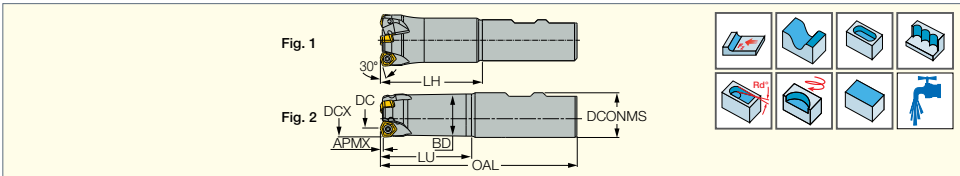


Designation	DC	DCX	APMX	CICT	OAL	DHUB	DCONMS	Arbor ⁽¹⁾	RMPX		Lbs
FF FWX D1.50-05-0.50-05	1.110	1.500	.039	5	1.250	1.378	.500	A	3.0	Y	.36
FF FWX D2.00-06-0.75-05	1.610	2.000	.039	6	1.500	1.772	.750	A	2.0	Y	.76
FF FWX D1.50-04-0.50-07	.990	1.500	.059	4	1.250	1.378	.500	A	4.6	Y	.32
FF FWX D2.00-05-0.75-07	1.490	2.000	.059	5	1.500	1.772	.750	A	2.5	Y	.70
FF FWX D2.50-06-1.00-07	1.990	2.500	.059	6	1.750	2.402	1.000	A	2.1	Y	1.42
FF FWX D3.00-07-1.25-07	2.528	3.000	.059	7	2.000	2.850	1.250	A	1.7	Y	2.46
FF FWX D4.00-08-1.50-07	3.488	4.000	.059	8	2.000	3.110	1.500	B	1.2	Y	3.20
FF FWX D2.00-04-0.75-08	1.370	2.000	.079	4	1.750	1.772	.750	A	4.7	Y	.77
FF FWX D2.50-05-1.00-08	1.870	2.500	.079	5	1.750	2.402	1.000	A	3.3	Y	1.30
FF FWX D3.00-06-1.25-08	2.370	3.000	.079	6	2.000	2.850	1.250	A	2.5	Y	2.26
FF FWX D4.00-07-1.50-08	3.370	4.000	.079	7	2.000	3.110	1.500	B	1.7	Y	2.98
FF FWX D5.00-09-1.50-08	4.370	5.000	.079	9	2.000	3.500	1.500	B	1.3	Y	4.88
FF FWX D6.00-10-2.00-08	5.370	6.000	.079	10	2.250	3.858	2.000	B	1.0	N	7.04

Spare Parts

Designation					
FF FWX D1.50-05-0.50-05	SR 10508600	T-9/51			SR UNF 1/4X3/4 B18.3
FF FWX D2.00-06-0.75-05	SR 10508600	T-9/51			SR UNF 3/8X1 B18.3
FF FWX D1.50-04-0.50-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR UNF 1/4X3/4 B18.3
FF FWX D2.00-05-0.75-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR UNF 3/8X1 B18.3
FF FWX D2.50-06-1.00-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR UNF 1/2X20X1 B18.3
FF FWX D3.00-07-1.25-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR UNF 5/8X1 B18.3
FF FWX D4.00-08-1.50-07	SR 34-535-SN		BLD T15/M7	SW6-T-SH	
FF FWX D2.00-04-0.75-08	SR 14-591/H		BLD T20/S7	SW6-T	SR UNF 3/8X1 B18.3
FF FWX D2.50-05-1.00-08	SR 14-591/H		BLD T20/S7	SW6-T	SR UNF 1/2X20X1 B18.3
FF FWX D3.00-06-1.25-08	SR 14-591/H		BLD T20/S7	SW6-T	SR UNF 5/8X1 B18.3
FF FWX D4.00-07-1.50-08	SR 14-591/H		BLD T20/M7	SW6-T	
FF FWX D5.00-09-1.50-08	SR 14-591/H		BLD T20/L7	SW6-T	
FF FWX D6.00-10-2.00-08	SR 14-591/H		BLD T20/L7	SW6-T	

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



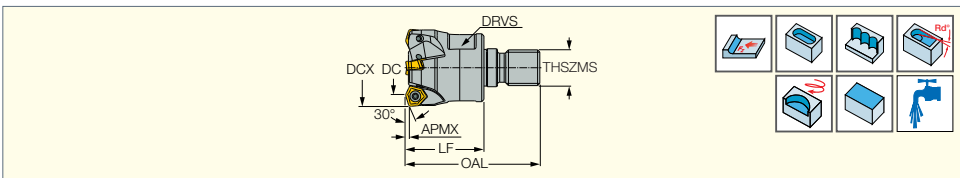
Designation	DCX	DC	CICT	LU	LH	OAL	APMX	DCONMS	BD	Shank ⁽¹⁾	RMPX	Fig.	Lbs
MF EWXD0.62-2-1.5W0.75-04	.625	.350	2	1.50	1.750	3.850	.059	.750	.580	W	3.8	2.	.33
MF EWXD0.75-3-2.0W0.75-04	.750	.470	3	2.00	2.100	4.200	.059	.750	.710	W	2.6	2.	.37
MF EWXD1.00-3-2.5W1.00-05	1.000	.630	3	2.50	2.650	5.000	.079	1.000	.940	W	2.9	2.	.80
MF EWXD1.25-4-3.0W1.25-05	1.250	.880	4	3.00	3.150	5.500	.079	1.250	1.200	W	1.9	2.	1.46
MF EWXD1.25-3-3.0W1.25-07	1.250	.770	3	3.00	3.150	5.500	.106	1.250	1.200	W	3.0	2.	1.39
MF EWXD1.50-4-3.5W1.25-07	1.500	1.020	4	3.50	6.000	6.000	.106	1.250	1.375	W	2.2	1.	1.93

⁽¹⁾ W-Weldon

Spare Parts

Designation				
MF EWXD0.62-2-1.5W0.75-04	SR M2.5X6-T7-60	T-7/51		
MF EWXD0.75-3-2.0W0.75-04	SR M2.5X6-T7-60	T-7/51		
MF EWXD1.00-3-2.5W1.00-05	SR 10508600	T-9/51		
MF EWXD1.25-4-3.0W1.25-05	SR 10508600	T-9/51		
MF EWXD1.25-3-3.0W1.25-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH
MF EWXD1.50-4-3.5W1.25-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH

MF EWX-M
Moderate Feed Endmills with FLEXFIT
Threaded Connection Carrying Double-
Sided Inserts with 6 Cutting Edges



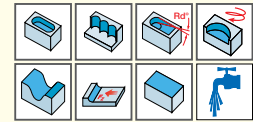
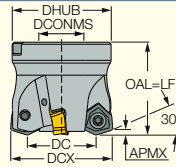
Designation	DCX	DC	APMX	CICT	LF	OAL	THSZMS	DRVS ⁽¹⁾	RMPX	Lbs
MF EWX D20-3-M10-04	.787	.512	.059	3	1.102	1.890	M10	.551	2.4	.11
MF EWX D25-4-M12-04	.984	.709	.059	4	1.260	2.126	M12	.669	1.7	.20
MF EWX D25-3-M12-05	.984	.610	.079	3	1.181	2.047	M12	.669	3.0	.16
MF EWX D32-4-M16-05	1.260	.886	.079	4	1.378	2.362	M16	.945	1.9	.36
MF EWX D32-3-M16-07	1.260	.776	.106	3	1.378	2.362	M16	.945	3.0	.32

⁽¹⁾ Clamping wrench size

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



Designation	DC	DCX	APMX	CICT	OAL	DHUB	DCONMS	Arbor ⁽¹⁾	RMPX	Lbs
MF FWX D1.50-05-0.50-05	1.128	1.500	.079	5	1.250	1.378	.500	A	1.5	.31
MF FWX D2.00-06-0.75-05	1.628	2.000	.079	6	1.500	1.772	.750	A	1.0	.63
MF FWX D2.50-08-1.00-05	2.127	2.500	.079	8	1.625	2.250	1.000	A	.8	1.14
MF FWX D1.50-04-0.50-07	1.020	1.500	.106	4	1.250	1.378	.500	A	2.2	.31
MF FWX D2.00-05-0.75-07	1.520	2.000	.106	5	1.500	1.772	.750	A	1.4	.64
MF FWX D2.50-06-1.00-07	2.020	2.500	.106	6	1.750	2.250	1.000	A	1.0	1.26
MF FWX D2.00-04-0.75-08	1.398	2.000	.138	4	1.750	1.772	.750	A	2.5	.71
MF FWX D2.50-05-1.00-08	1.898	2.500	.138	5	1.750	2.402	1.000	A	1.7	1.25
MF FWX D3.00-06-1.25-08	2.398	3.000	.138	6	2.000	2.850	1.250	A	1.3	2.09
MF FWX D4.00-07-1.50-08	3.398	4.000	.138	7	2.000	3.110	1.500	B	.9	2.80
MF FWX D5.00-09-1.50-08	4.398	5.000	.138	9	2.000	3.500	1.500	B	.7	4.82

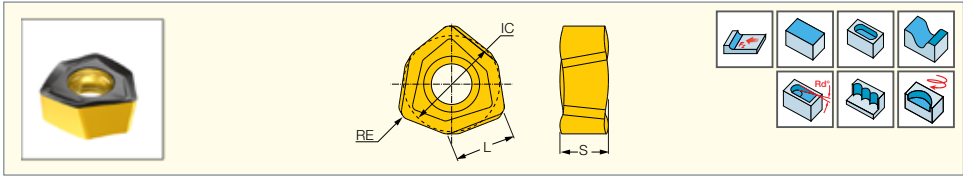
Spare Parts

Designation					
MF FWX D1.50-05-0.50-05	SR 10508600	T-9/51			SR UNF 1/4X3/4 B18.3
MF FWX D2.00-06-0.75-05	SR 10508600	T-9/51			SR UNF 3/8X1 B18.3
MF FWX D2.50-08-1.00-05	SR 10508600	T-9/51			SR UNF 1/2X20X1 B18.3
MF FWX D1.50-04-0.50-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR UNF 1/4X3/4 B18.3
MF FWX D2.00-05-0.75-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR UNF 3/8X1 B18.3
MF FWX D2.50-06-1.00-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR UNF 1/2X20X1 B18.3
MF FWX D2.00-04-0.75-08	SR 14-591/H		BLD T20/S7	SW6-T	SR UNF 3/8X1 B18.3
MF FWX D2.50-05-1.00-08	SR 14-591/H		BLD T20/S7	SW6-T	SR UNF 1/2X20X1 B18.3
MF FWX D3.00-06-1.25-08	SR 14-591/H		BLD T20/S7	SW6-T	SR UNF 5/8X1 B18.3
MF FWX D4.00-07-1.50-08	SR 14-591/H		BLD T20/M7	SW6-T	
MF FWX D5.00-09-1.50-08	SR 14-591/H		BLD T20/L7	SW6-T	



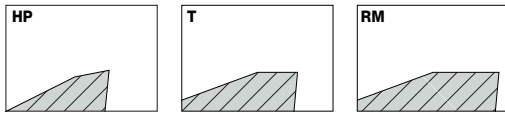
H600 WXC

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



Designation	Dimensions				Tough ↔ Hard						
	IC	L	S	RE ⁽⁴⁾	IC882	IC330	IC830	IC5820	IC380	IC808	IC810
H600 WXC 040310HP ⁽¹⁾	.246	.163	.122	.038		•	•				
H600 WXC 040310T ⁽²⁾	.246	.163	.122	.038			•			•	
H600 WXC 05T312HP ⁽¹⁾	.328	.217	.165	.047	•	•	•	•			
H600 WXC 05T312T ⁽²⁾	.328	.217	.165	.047			•			•	•
H600 WXC 070515HP ⁽¹⁾	.439	.282	.232	.059	•	•	•	•	•		
H600 WXC 070515T ⁽²⁾	.439	.282	.232	.059			•			•	•
H600 WXC 080612HP ⁽¹⁾	.537	.346	.268	.047	•	•	•		•	•	
H600 WXC 080612T ⁽²⁾	.537	.346	.268	.047			•			•	•
H600 WXC 080616RM ⁽³⁾	.537	.346	.268	.063			•			•	

- ⁽¹⁾ For stainless steel and high temperature alloys
- ⁽²⁾ For alloy steel and cast iron, "I" mark on top rake face for identification
- ⁽³⁾ For interrupted cut and hard materials
- ⁽⁴⁾ For insert radius for programming see table below



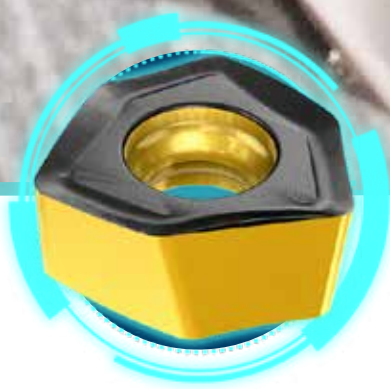
Inserts	Cutting Recommendations for FF Tools		Radius for Programming on FF Tools (inch)	Cutting Recommendations for MF Tools		Radius for Programming on MF Tools (inch)
	ap (inch)	fz (ipt)		ap (inch)	fz (ipt)	
H600 WXC 040310HP	.020 - .031	.013-.027	.075	.020-.060	.008-.016	.102
H600 WXC 040310T	.020 - .031	.027-.040	.075	.020-.060	.016-.024	.102
H600 WXC 05T312HP	.028 - .039	.013-.027	.091	.031-.079	.008-.016	.130
H600 WXC 05T312T	.028 - .039	.027-.040	.091	.031-.079	.016-.024	.130
H600 WXC 070515HP	.039 - .059	.013-.034	.122	.040-.100	.008-.020	.161
H600 WXC 070515T	.039 - .059	.027-.054	.122	.040-.100	.016-.031	.161
H600 WXC 080612HP	.059 - .079	.013-.034	.130	.071-.138	.008-.020	.189
H600 WXC 080612T	.059 - .079	.027-.054	.130	.071-.138	.016-.031	.189
H600 WXC 080616RM	.059 - .079	.027-.054	.146	.071-.138	.016-.031	.205

Inserts	Cutting Recommendations for FF Tools in plunging		Radius for Programming on FF Tools (inch)	Cutting Recommendations for MF Tools in plunging		Radius for Programming on MF Tools (inch)
	ae (inch)	fz (ipt)		ae (inch)	fz (ipt)	
H600 WXC 040310HP	.146	.002-.003	.075	.138	.002-.003	.102
H600 WXC 040310T	.146	.002-.004	.075	.138	.002-.004	.102
H600 WXC 05T312HP	.197	.002-.003	.091	.187	.002-.003	.130
H600 WXC 05T312T	.197	.002-.004	.091	.187	.002-.004	.130
H600 WXC 070515HP	.256	.002-.004	.122	.242	.002-.004	.161
H600 WXC 070515T	.256	.002-.005	.122	.242	.002-.005	.161
H600 WXC 080612HP	.315	.002-.004	.130	.301	.002-.004	.189
H600 WXC 080612T	.315	.002-.005	.130	.301	.002-.005	.189
H600 WXC 080616RM	.315	.002-.005	.146	.301	.002-.005	.205

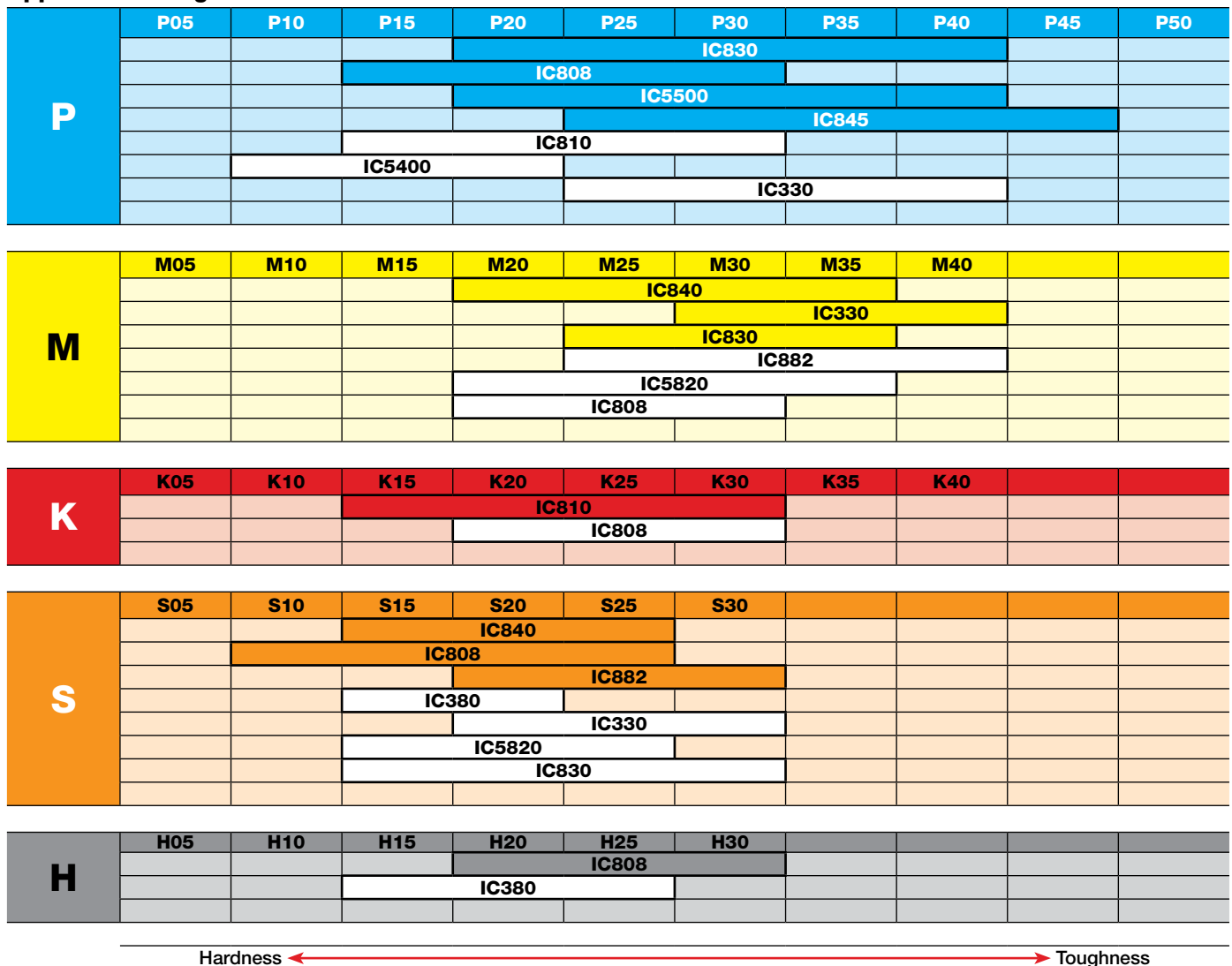
Scarf HELI DO 3152265
MF FWX D063-05-27-08-V2

HELI6FEED

UPFEED LINE



Application Range of Carbide Grades for Indexable lines



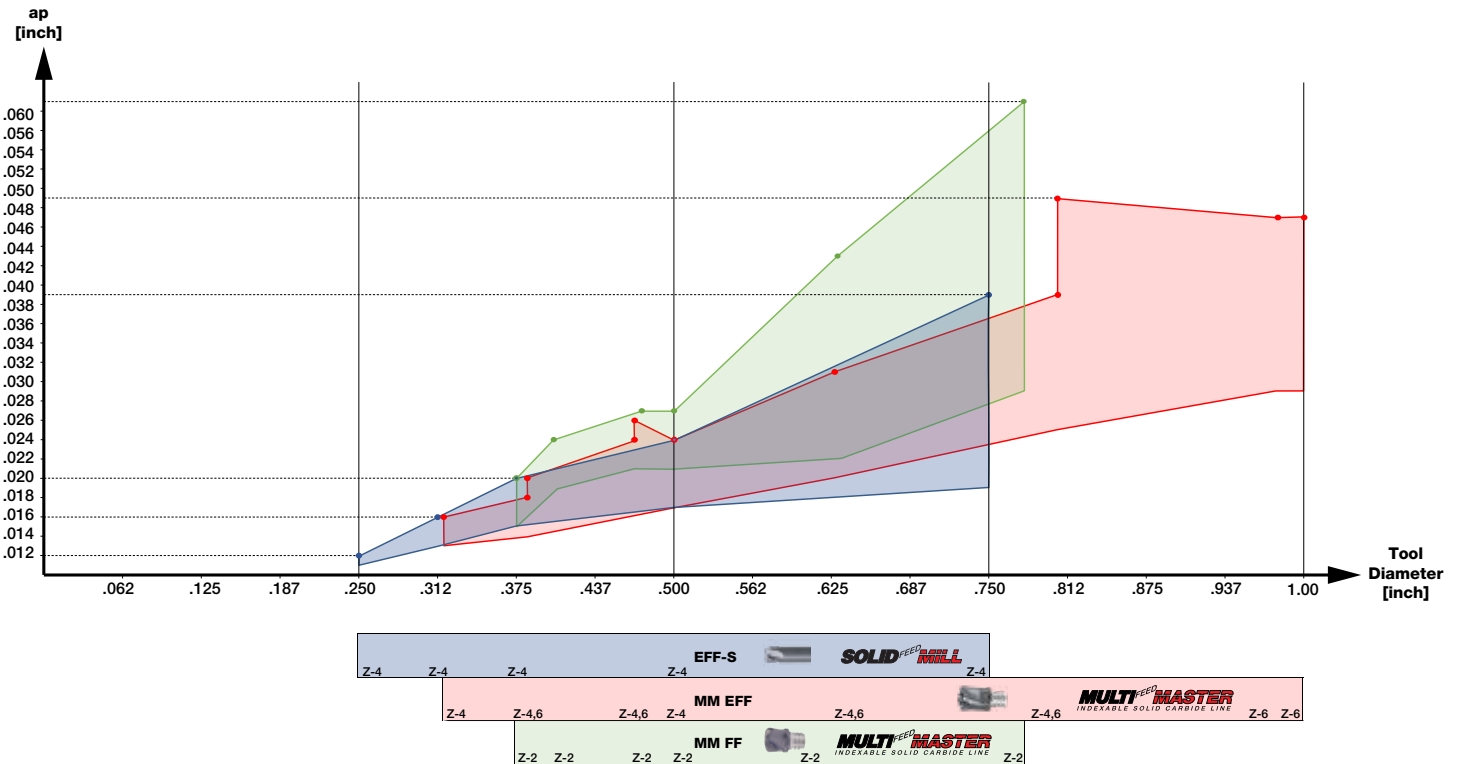
ICX The marked area features the most suitable grade
ICXX The white area relates to a complementary grade

Recommended Cutting Speed Range for Indexable Fast Feed Mill Cutters

ISO	Material	Condition	Material No.	Grade											
				IC330	IC380	IC882	IC845	IC840	IC830	IC5820	IC5400	IC5500	IC808	IC810	
P	Non alloy steel and cast steel (less than 5% all elements)	< 0.25 %C	Annealed	1	460-660			430-720		490-660		590-820	490-590	490-720	490-720
		>= 0.25 %C	Annealed	2	430-620			390-660		460-620		460-790	460-560	490-721	460-720
		< 0.55 %C	Quenched and tempered	3	430-620			390-620		460-620		460-750	460-660	490-690	460-690
		>= 0.55 %C	Annealed	4	390-590			390-590		430-590		460-720	430-660	460-690	430-690
		>= 0.55%C	Quenched and tempered	5	390-560			360-590		430-560		460-720	430-620	460-690	430-690
	Low alloy steel and cast steel (less than 5% all elements)	Annealed	6	390-520			360-560		390-520		460-690	430-590	460-660	430-660	
		Quenched and tempered	7	360-490			330-520		390-460		430-660	400-560	430-620	400-620	
			8	330-460			330-490		360-460		430-620	360-520	430-590	400-590	
	High alloy steel, cast steel and tool steel	Annealed	10	260-420			260-460		290-390		400-590	360-490	400-560	400-560	
		Quenched and tempered	11	260-390			260-420		290-360		400-560	330-460	400-520	360-520	
	Stainless steel and cast steel	Ferritic/martensitic	12	330-460			360-520		290-520		400-560	300-520	360-560	360-560	
		Martensitic	13	290-420			330-490		260-490		360-520	260-490	330-520	330-490	
	M	Stainless steel and cast steel	Austenitic	14	260-390		230-460		260-490	260-460	330-520			330-520	
K	Gray cast iron	Ferritic/pearlitic	15										460-660	490-720	
		Pearlitic/martensitic	16										430-620	460-590	
	Ductile cast iron (nodular)	Ferritic	17										360-590	400-660	
		Pearlitic	18										330-560	330-590	
	Malleable cast iron	Ferritic	19										460-620	460-690	
		Pearlitic	20										360-560	360-660	
S	High temp. alloys	Fe based	Annealed	31	115-165	130-165	115-165		100-150	80-165	130-165			130-165	
			Cured	32	100-130	115-150	100-130		65-115	65-130	100-130			100-130	
		Ni or Co bases	Annealed	33	80-115	100-150	80-115		65-100	65-130	100-130			80-130	
			Cured	34	65-115	80-115	65-80		65-80	65-115	80-115			80-115	
	Titanium and Ti alloys		35	80-100	100-115	80-100		80-100	65-130	100-115			100-130		
		Alpha+beta alloys cured	36	130-230	165-260	150-230		130-200	80-165	130-260			150-300		
H	Hardened steel	Hardened	38		150-180								150-210		
		Hardened	39		130-165								130-200		
	Chilled cast iron	Cast	40		230-300								230-280		
	Cast iron	Hardened	41		150-180								150-210		

- For machining in unstable conditions (long overhang, poor toolholing etc.) the recommended cutting data should be reduced by 20-30%
- Recommended cutting speeds, which relate to the most suitable grades, are emphasized by **bold**

Solid Carbide and Multi-Master Chart



Fast Feed Family Selector for Solid Carbide Endmills (SCEM) and Multi-Master Heads (MM)

Range of diameters (inch)	Family	Description	AP (inch)	Range of fz (ipt)	Applications							Material Groups				
												P	M	K	S	H
Ø.250-.750	SOLID FEED MILL	EFF-S	.012-.039	.0040-.0276	●	○	●	●	●	●	●	●	○	●	●	●
Ø.315-1.00	MULTI-MASTER	MM-EFF	.016-.049	.0047-.0394	●	●	●	●	●	●	●	●	●	●	●	○
Ø.375-.787	MULTI-MASTER	MM FF	.020-.059	.0118-.0591	●	●	●	●	●	●	●	●	○	●	○	○

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



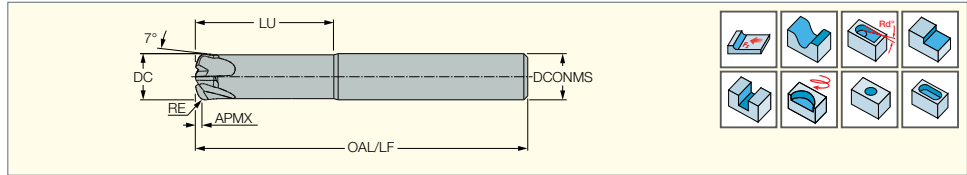
MULTI^{FEED}MASTER



SOLID FEED MILL

EFFI-S4

4 Flute with Relieved Necks,
Fast Feed High Productivity
Solid Carbide Endmills



Designation	Dimensions							IC903	Recommended Machining Data
	DC	DCONMS	OAL	LU	RE ⁽¹⁾	PRFRAD	APMX		f _z (inch/t)
EFFI-S4-250 125/750C250M	.250	.250	2.500	.750	.039	.220	.012	●	.0040-.0118
EFFI-S4-312 137/1.00C312M	.312	.312	2.500	1.000	.051	.276	.016	●	.0040-.0157
EFFI-S4-375 157/1.20C375M	.375	.375	3.000	1.200	.059	.331	.020	●	.0060-.0197
EFFI-S4-500 180/1.30C500M	.500	.500	3.000	1.300	.083	.441	.024	●	.0060-.0197
EFFI-S4-750 230/1.80C750M	.750	.750	4.000	1.800	.118	.665	.039	●	.0080-.0276

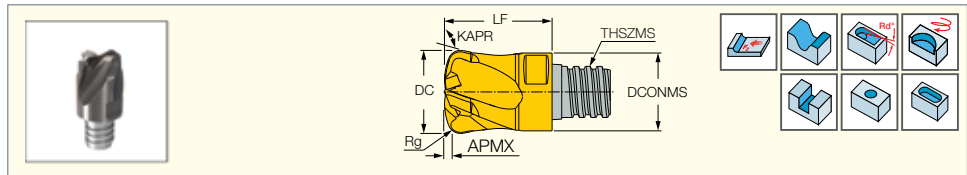
⁽¹⁾ Radius for programming

MULTI FEED MASTER

SOLID FEED MILL

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	APMX	THSZMS	DCONMS	LF	RMPX	KAPR	R _g ⁽³⁾		IC908	IC903	f _z (inch/t)
MM EFF080T3R1.62-4T05	.315	4	.016	T05	.295	.394	5.0	97.0	.064	N		●	.0047-.0189
MM EFF100T4R2.01-4T06	.394	4	.020	T06	.374	.512	5.0	97.0	.079	N		●	.0063-.0224
MM EFF100T2R1.0-6T06H⁽¹⁾	.394	6	.018	T06	.374	.394	3.0	97.0	.039	Y		●	.0063-.0185
MM EFF120T4R1.8-4T08H⁽¹⁾	.472	4	.024	T08	.453	.650	5.0	97.0	.071	Y	●	●	.0063-.0264
MM EFF120T4R2.47-4T08	.472	4	.024	T08	.453	.650	5.0	97.0	.097	N		●	.0063-.0264
MM EFF120T2R1.2-6T08H⁽¹⁾	.472	6	.026	T08	.453	.492	3.0	97.0	.047	Y		●	.0063-.0213
MM EFF127T4R2.59-4T08	.500	4	.024	T08	.480	.650	5.0	97.0	.102	N		●	.0063-.0264
MM EFF160T5R2.2-4T10H⁽¹⁾	.630	4	.031	T10	.606	.807	5.0	97.0	.087	Y	●		.0079-.0295
MM EFF160T5R3.25-4T10	.630	4	.031	T10	.606	.807	5.0	97.0	.128	N		●	.0079-.0295
MM EFF160T4R2.0-6T10H⁽¹⁾	.630	6	.041	T10	.606	.630	3.0	97.0	.079	Y		●	.0079-.0256
MM EFF200T6R4.02-4T12	.787	4	.039	T12	.726	1.004	5.0	97.0	.158	N		●	.0079-.0354
MM EFF200T5R2.2-6T12H⁽¹⁾	.787	6	.049	T12	.726	.787	3.0	97.0	.087	Y		●	.0079-.0315
MM EFF250A7R3.1-6T15⁽²⁾	.984	6	.047	T15	.941	.984	5.0	97.0	.122	N		●	.0098-.0394
MM EFF254A7R3.1-6T15⁽²⁾	1.000	6	.047	T15	.941	.984	5.0	97.0	.122	N		●	.0098-.0394

• Do not apply lubricant to the threaded connection.

⁽¹⁾ With a central coolant hole

⁽²⁾ Cannot be used for plunging application

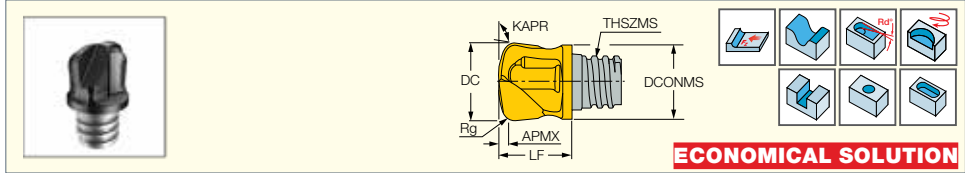
⁽³⁾ Radius for programming

MULTI^{FEED} MASTER

SOLID^{FEED} MILL

MM FF

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



Designation	Dimensions									Tough ← Hard		Recommended Machining Data fz (inch/t)
	DC	NOF	APMX	Rg ⁽¹⁾	THSZMS	DCONMS	LF	KAPR	RMPX	IC908	IC903	
MM FF375R06-L49-2T06	.375	2	.020	.059	T06	.360	.490	100.0	7.0	●		.0118-.0236
MM FF100R1.5-L12-2T06	.394	2	.024	.079	T06	.378	.492	97.0	7.0	●		.0118-.0236
MM FF120R2.0-2T08	.472	2	.027	.098	T08	.453	.437	97.0	7.0	●	●	.0197-.0394
MM FF500R08-L59-2T08	.500	2	.027	.098	T08	.453	.591	95.0	7.0	●		.0197-.0394
MM FF160R2.0-2T10	.630	2	.043	.118	T10	.598	.531	97.0	7.0	●		.0217-.0433
MM FF.750R.08-2T12	.750	2	.056	.079	T12	.726	.685	100.0	7.0	●		.0295-.0591
MM FF200R2.0-2T12	.787	2	.059	.134	T12	.726	.685	95.0	7.0	●		.0295-.0591

● Do not apply lubricant to the threaded connection.

⁽¹⁾ Radius for programming

Machining Recommendations

VDI 3323	Material Group ⁽¹⁾	Vc (SFM)	fz [ipt] vs Tool Diameter (Inch)							
			ap	ae	.314	.393	.472	.629	.787	.984
P	1	590	0.045xD	0.7xD	.0188	.0224	.0263	.0295	.0354	.0393
	2	525	0.045xD	0.7xD	.0188	.0224	.0263	.0295	.0354	.0393
	3	525	0.045xD	0.7xD	.0188	.0224	.0263	.0295	.0354	.0393
	4	525	0.045xD	0.7xD	.0188	.0224	.0263	.0295	.0295	.0393
	5	490	0.045xD	0.7xD	.0169	.0196	.0224	.0224	.0263	.0342
	6	490	0.045xD	0.7xD	.0129	.0157	.0188	.0188	.0263	.0307
	7	460	0.045xD	0.7xD	.0129	.0157	.0188	.0188	.0236	.0307
	8	460	0.045xD	0.7xD	.0118	.0137	.0169	.0169	.0236	.0275
	9	460	0.045xD	0.7xD	.0118	.0137	.0169	.0169	.0224	.0275
	10	425	0.04xD	0.6xD	.011	.0137	.0149	.0149	.0204	.0263
	11	390	0.04xD	0.6xD	.0098	.0118	.0137	.0137	.0236	.0244
K	15-16	590	Apmax	0.7xD	.0177	.020	.0236	.0236	.0275	.0354
	17-18	525	Apmax	0.7xD	.0149	.0177	.0204	.0204	.0188	.0314
H	38.1 ⁽²⁾	330	0.035xD	0.45xD	.0078	.0098	.0129	.0129	.0177	.0216
	38.2 ⁽³⁾	260	0.03xD	0.3xD	.0062	.0086	.0118	.0118	.0078	.0204
	39 ⁽⁴⁾	195	0.02xD	0.25xD	.0047	.0062	.0062	.0062	.0062	.0098

⁽¹⁾ ISCAR material group in accordance with VDI 3323 standard

⁽²⁾ 45-49 HRC

⁽³⁾ 50-55 HRC

⁽⁴⁾ 56-63 HRC

ap - Depth of cut

ae - Width of cut

Application Range of Carbide Grades for Solid Carbide Endmills and Multi-Master heads

P	P05	P10	P15	P20	P25	P30	P35	P40	P45	P50
	IC903									
	IC902									
M	M05	M10	M15	M20	M25	M30	M35	M40		
	IC902			IC903						
K	K05	K10	K15	K20	K25	K30	K35	K40		
	IC903									
	IC902									
S	S05	S10	S15	S20	S25	S30				
	IC902		IC903							
H	H05	H10	H15	H20	H25	H30				
	IC902									
	IC903									

Hardness ← → Toughness



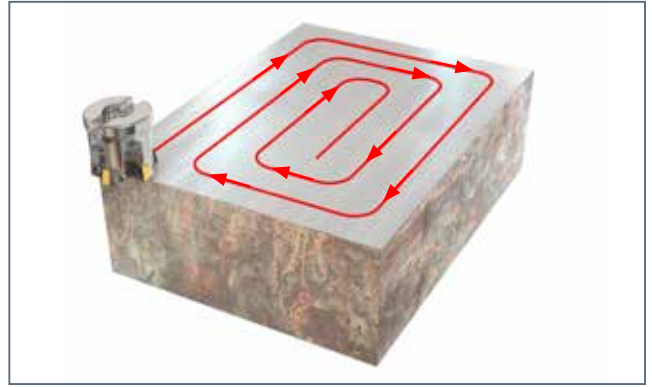
Recommended Cutting Speed Range for Fast Feed Solid & Multi-Master Endmills

ISO	Material	Condition	Material No.	Grade			
				IC902	IC903	IC908	
P	Non alloy steel and cast steel (less than 5% all elements)	< 0.25 %C	Annealed	1	820-980	820-990	850-920
		>= 0.25 %C	Annealed	2	660-820	660-750	660-750
		< 0.55 %C	Quenched and tempered	3	520-790	520-720	520-720
		>= 0.55 %C	Annealed	4	520-790	520-720	520-720
		>= 0.55%C	Quenched and tempered	5	460-660	460-180	460-590
	Low alloy steel and cast steel (less than 5% all elements)	Annealed	6	520-790	520-720	520-720	
		Quenched and tempered	7	400-660	400-590	400-590	
			8	430-660	430-660	430-590	
	High alloy steel, cast steel and tool steel	9	460-660	430-590	460-430		
		Annealed	10	430-660	430-180	430-590	
	Stainless steel and cast steel	Quenched and tempered	11	230-430	230-400	230-400	
		Ferritic/martensitic	12	260-570	260-520	260-520	
	Stainless steel and cast steel	Martensitic	13	200-540	200-490	200-490	
Stainless steel and cast steel		Austenitic180	14	200-430	200-400	200-400	
K	Gray cast iron	Ferritic/pearlitic	15	260-900	260-820	260-850	
		Pearlitic/martensitic	16	430-870	430-790	430-790	
	Ductile cast iron (nodular)	Ferritic	17	490-980	490-890	490-920	
		Pearlitic	18	300-980	300-890	300-920	
	Malleable cast iron	Ferritic	19	490-980	490-890	490-920	
		Pearlitic	20	460-870	460-790	460-790	
S	High temp. alloys	Fe based	Annealed	31	65-150	65-130	65-130
			Cured	32	65-115	65-100	65-130
		Ni or Co bases	Annealed	33	65-115	65-100	65-100
			Cured	34	65-115	65-100	65-100
			Cast	35	100-300	100-260	100-245
	Titanium and Ti alloys		36	100-300	100-260	100-245	
		Alpha+beta alloys cured	37	100-300	100-260	100-245	
H	Hardened steel	Hardened	38	100-210	100-200	100-165	
		Hardened	39	100-150	100-130	100-130	
	Chilled cast iron	Cast	40	230-330	230-300	200-260	
	Cast iron	Hardened	41	100-210	330-690	100-165	

Recommendations for Machining Methods

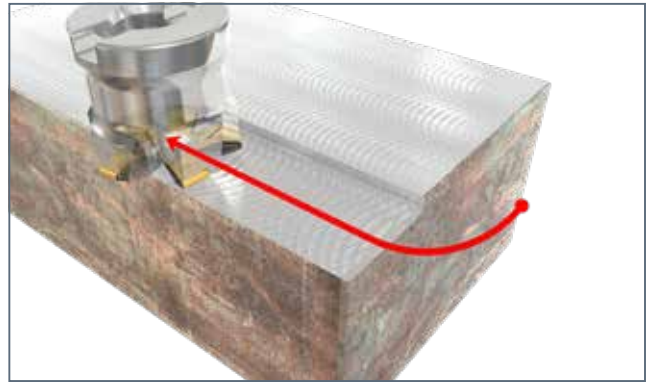
Face Milling Including Milling Next to Square Shoulder

- It is recommended that a 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 further 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, 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.

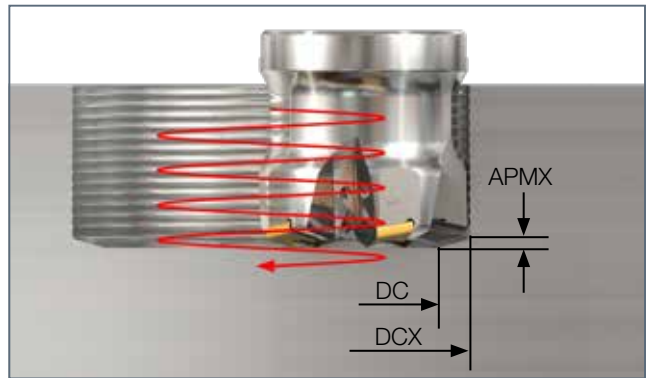


Milling Hole of Diameter D by Helical Interpolation

Maximum and minimum hole diameters
Dmax and Dmin correspondingly:

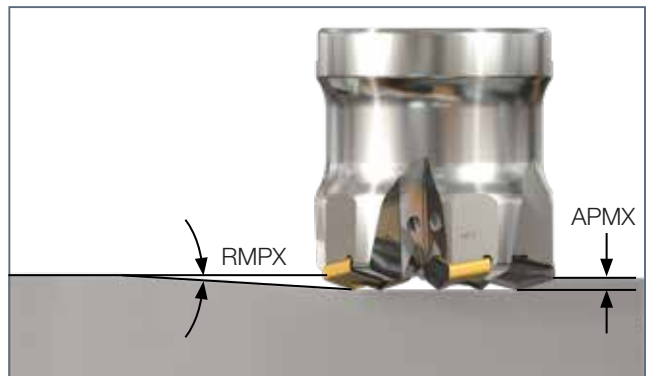
$$D_{max} = 2 \times DCX - 1, \quad D_{min} = DCX + DC$$

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



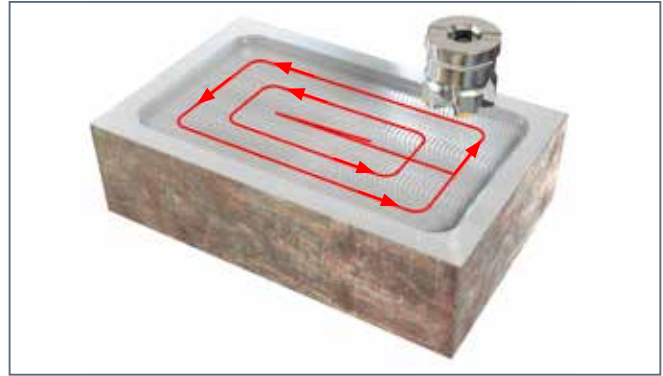
Milling by Ramping Down

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



Pocket Milling

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

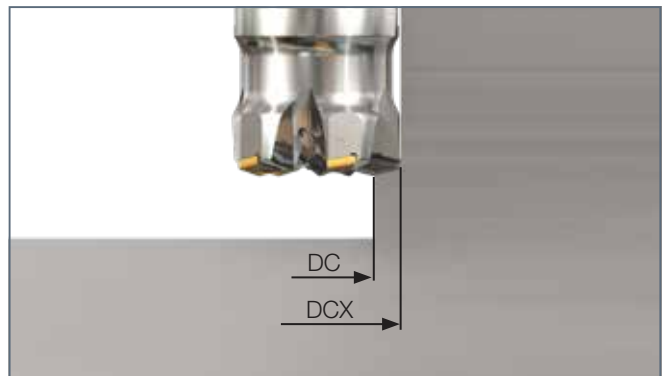
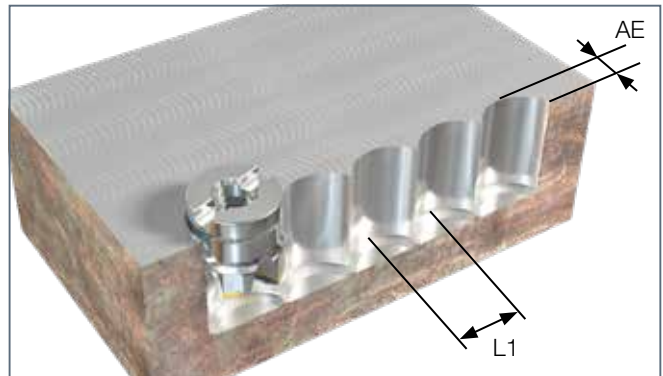


Side Plunge Milling

- The relationship between L1max and ae is given by the following formulas:

$$ae_{max} = (DCX - DC)/2$$

$$L1_{max} = 2 \times \sqrt{(DCX \times ae - ae^2)}$$
- 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



FAST FEED MILLING

