FAST FEED MILLING

Quick Tool Selector Guide

Metric Version

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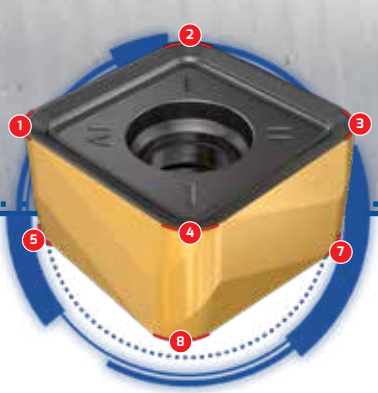
SCAN ME

Contents

NEOFEED
HIGH FEED LINE



8 Cutting Edges Perform
at Fast Feed and Moderate Rates

Highly Durable
Straight Cutting Edge

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.

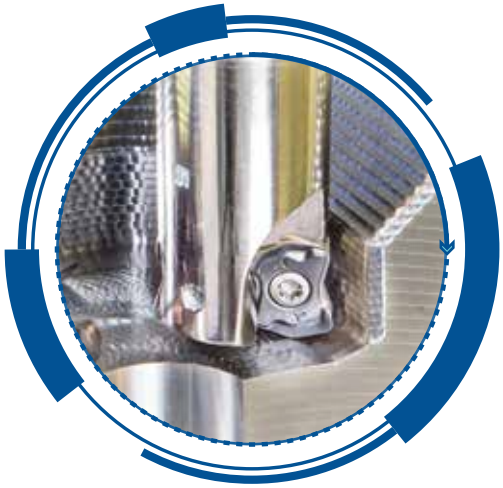
Another concept is based on using one or two straight edges that are chords of the arc. In both cases, the small cutting edge angle (usually 9-17°) meets the requirements of chip thinning and total cutting force. Ensuring the geometry of solid carbide fast feed endmills and replaceable milling heads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

Id 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 the required thickness. The same situation is observed in ball-nose milling tools, which explains why FF cutters run so fast.

NAN3FEED
NANO FEED MILL



LOGIQ4FEED
HIGH FEED MILLING

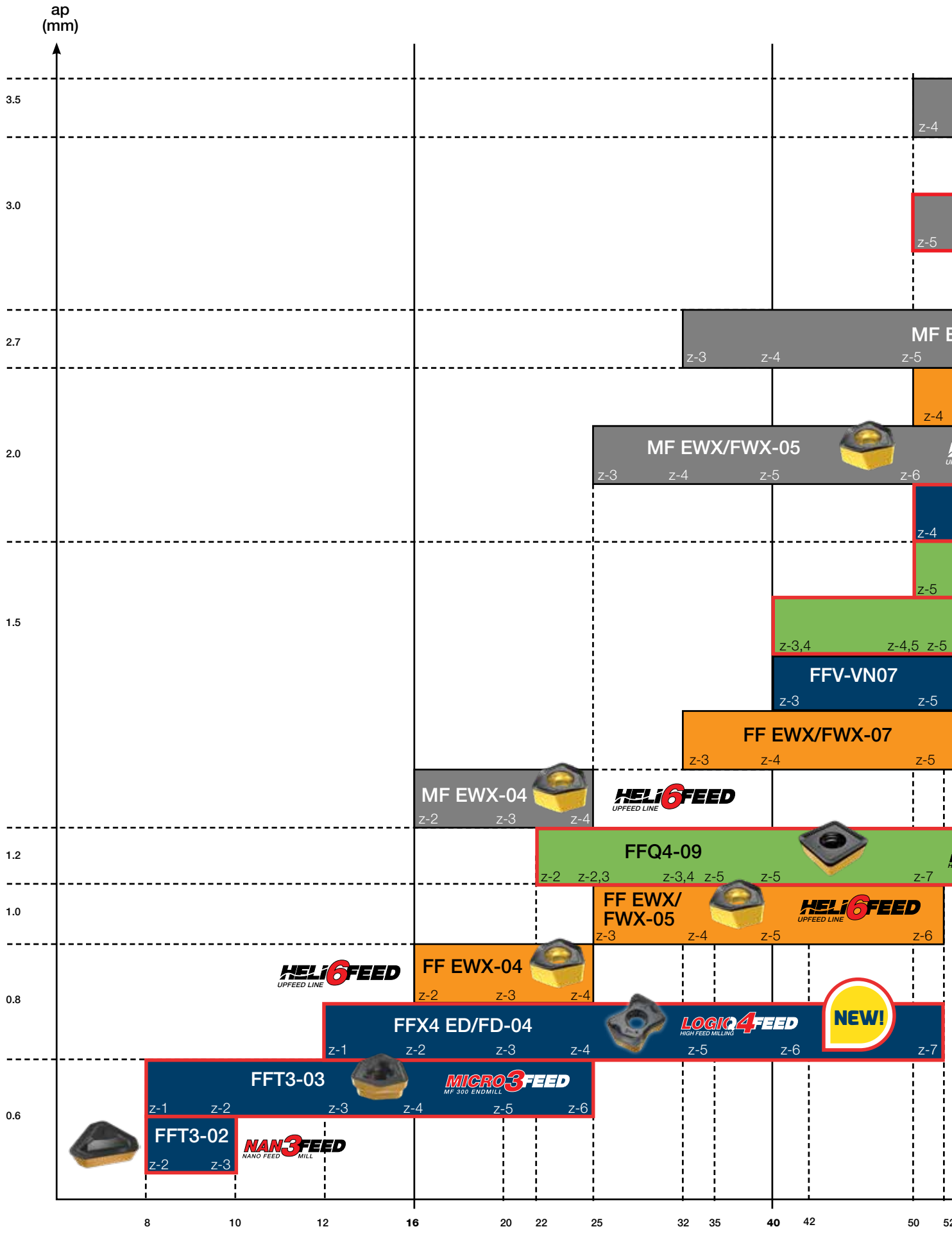
NEOFEED
HIGH FEED LINE

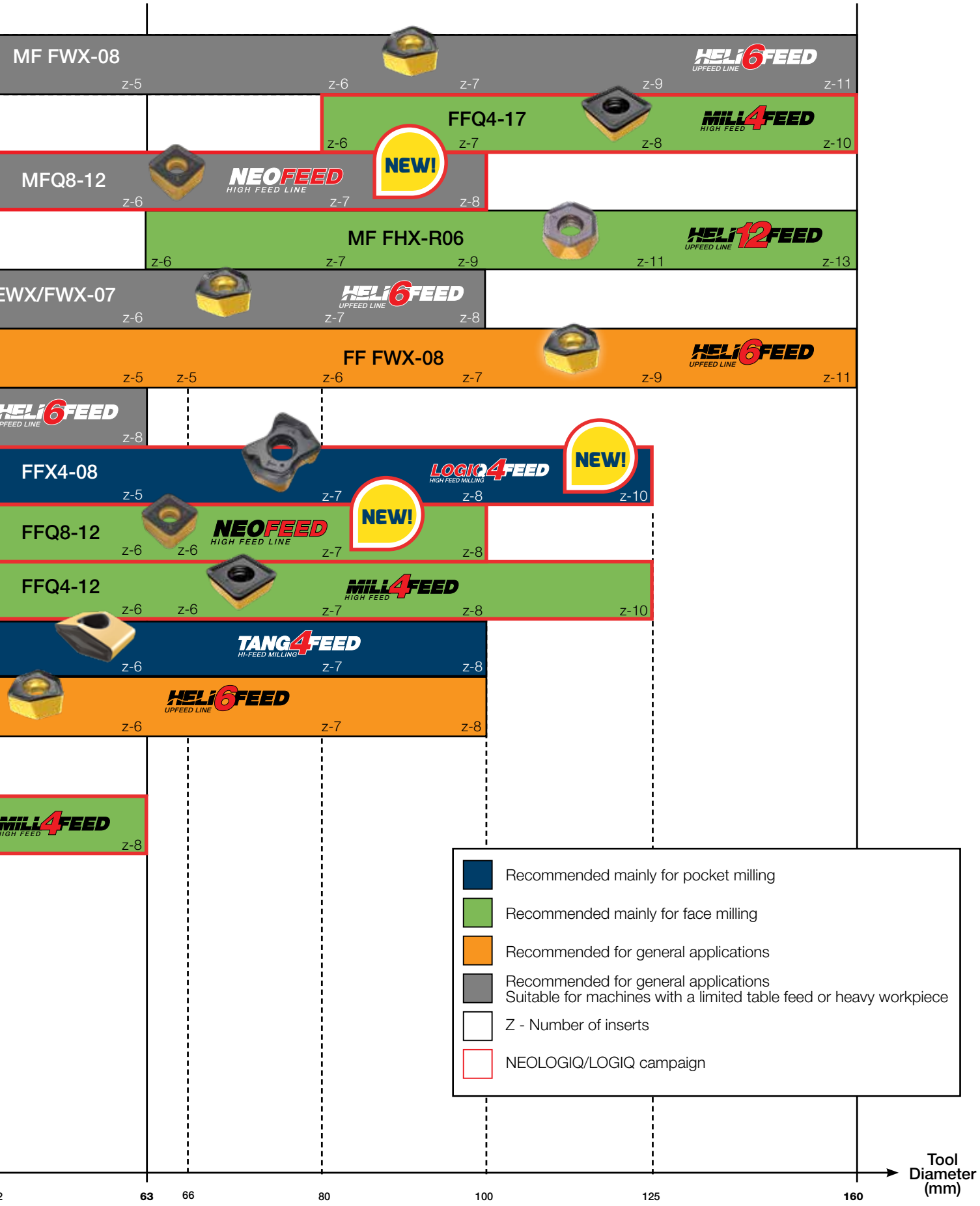
MICRO3FEED
MF 300 ENDMILL

FF milling requires machine tools with high-speed feed drive. Various powerful yet slow machines which are common in metalworking, are not suitable for fast feed milling. However, **ISCAR**'s 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 tradional 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.

ISCAR Fast Feed (High Feed) Indexable Milling Chart




MF FWX-08
z-5
z-6
z-7
z-9
z-11
HELI 6 FEED
UPFEED LINE
FFQ4-17
z-6
z-7
z-8
z-10
MILL 4 FEED
HIGH FEED
NEW!
MFQ8-12
z-6
z-7
z-8
NEOFEED
HIGH FEED LINE
MF FHX-R06
z-6
z-7
z-9
z-11
z-13
HELI 12 FEED
UPFEED LINE
EWX/FWX-07
z-6
z-7
z-8
HELI 6 FEED
UPFEED LINE
FF FWX-08
z-5
z-5
z-6
z-7
z-9
z-11
HELI 6 FEED
UPFEED LINE
z-8
FFX4-08
z-5
z-7
z-8
z-10
LOGIQ 4 FEED
HIGH FEED MILLING
NEW!
FFQ8-12
z-6
z-6
z-7
z-8
NEOFEED
HIGH FEED LINE
NEW!
FFQ4-12
z-6
z-6
z-7
z-8
z-10
MILL 4 FEED
HIGH FEED
TANG 4 FEED
HI-FEED MILLING
z-6
z-7
z-8
HELI 6 FEED
UPFEED LINE
z-6
z-7
z-8
MILL 4 FEED
HIGH FEED
z-8
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 - Number of inserts
NEOLOGIQ/LOGIQ campaign
63
66
80
100
125
160
Tool Diameter (mm)

Indexable Fast Feed Family Selector

Diameter range (mm)	Family	Description	APMX (mm)	Available diameters (mm) for configuration		Insert			
				Endmill	MM[1]	Description	Chip former	No. of sides	No. of edges
Ø8-16	NANFEED	FFT3 EFM-02	0.6	8-10	8-10	FFT3 TXMT 020105	T	1	3
	MICRO3FEED	FFT3 EFM-03	0.6	8-16	10-16	FFT3 WXMT 030206	T	1	3
	LOGIQ4FEED	FFX4 ED-04	0.8	12-16	16	FFX4 XNMU 040310	T, RM-T, HP, RM-HP	2	4
	HELI6FEED	FF EWX-04	0.8	16	16	H600 WXCU 040310	T, HP	2	6
	HELI6FEED	MF EWX-04	1.5	16		H600 WXCU 040310	T, HP	2	6

Diameter range (mm)	Family	Description	APMX (mm)	Available diameters (mm) for configuration				Insert			
				Endmill	MM[1]	FLEXFIT	Facemill	Description	Chip former	No. of sides	No. of edges
Ø20-40	MICRO3FEED	FFT3 EFM-03	0.6	20-25	20-25			FFT3 WXMT 030206	T	1	3
	LOGIQ4FEED	FFX4 ED/FD-04	0.8	20-32	20-25	20-42	32-40	FFX4 XNMU 040310	T, RM-T, HP, RM-HP	2	4
	HELI6FEED	FF EWX-04	0.8	20	20-25	20-25		H600 WXCU 040310	T, HP	2	6
	HELI6FEED	FF EWX/FWX-05	1.0	20-40	25	25-40	40	H600 WXCU 05T312	T, HP	2	6
	MILL4FEED	FFQ4-09	1.2	22-35		22-40	40	FFQ4 SOMT 0904	T, RM-T, HP, RM-HP	1	4
	MILL4FEED	FFQ4-09	1.0	22-35		22-40	40	FFQ4 SOMW 0904	SOMW	1	4
	HELI6FEED	MF EWX-04	1.5	20		20-25		H600 WXCU 040310	T, HP	2	6
	HELI6FEED	FF EWX/FWX-07	1.5	32-40		32-40	40	H600 WXCU 070515	T, HP	2	6
	TANG4FEED	FFV-D-R-07	1.5				40	FF VNMT 0706ZN	ER, ETR	2	4
	MILL4FEED	FFQ4-12	1.5				40	FFQ4 SOMT 1205	T, T20, RM-T, HP, RM-HP, HP-P	1	4
	HELI6FEED	MF EWX/FWX-05	2.0	25-32		25-32	40	H600 WXCU 05T312	T, HP	2	6
	HELI6FEED	MF EWX/FWX-07	2.7	32-40		32	40	H600 WXCU 070515	T, HP	2	6

Diameter range (mm)	Family	Description	APMX (mm)	Available diameters (mm) for configuration	Insert			
				Facemill	Description	Chip former	No. of sides	No. of edges
Ø50-63	LOGIQ4FEED	FFX4 ED/FD-04	0.8	50-52	FFX4 XNMU 040310	T, RM-T, HP, RM-HP	2	4
	HELI6FEED	FF FWX-05	1.0	50-52	H600 WXCU 05T312	T, HP	2	6
	MILL4FEED	FFQ4-09	1.2	50-63	FFQ4 SOMT 0904	T, RM-T, HP, RM-HP	1	4
	MILL4FEED	FFQ4-09	1.0	50-63	FFQ4 SOMW 0904	SOMW	1	4
	HELI6FEED	FF FWX-07	1.5	50-63	H600 WXCU 070515	T, HP	2	6
	TANG4FEED	FFV-D-R-VN07	1.5	50-63	FF VNMT 0706ZN	ER, ETR	2	4
	MILL4FEED	FFQ4-12	1.5	50-66	FFQ4 SOMT 1205	T, T20, RM-T, HP, RM-HP, HP-P	1	4
	MILL4FEED	FFQ4-12	1.2	50-66	FFQ4 SOMW 1205	SOMW	1	4
	NEOFEED	FFQ8 FD	1.5	50-63	FFQ8 SZMU 120520	T, HP	2	8
	LOGIQ4FEED	FFX4 FD-08	2.0	50-63	FFX4 XNMU 080620	T, HP	2	4
	HELI6FEED	MF FWX-05	2.0	50-63	H600 WXCU 05T312	T, HP	2	6
	HELI6FEED	FF FWX-08	2.0	50-63	H600 WXCU 0806	T, HP, RM	2	6
	HELI6FEED	MF FWX-07	2.7	50-63	H600 WXCU 070515	T, HP	2	6
	NEOFEED	MFQ8 FD	3.0	50-63	FFQ8 SZMU 120520	T, HP	2	8
	HELI12FEED	MF FHX-R06	3.0	63	H1200 HXCU 0606	TR, HPR	2	12
	HELI6FEED	MF FWX-08	3.5	50-63	H600 WXCU 0806	T, HP, RM	2	6

[1] MM - Multi-Master Heads

Range of f_z (mm/t)	Radius for Programming	Applictions							Material Groups				
									P	M	K	S	H
0.20-0.70	1.1	○	o	●	●	○	●	●	●				
0.20-0.80	1.1	○	●	●	●	○	●	●	●		o	●	○
0.20-1.20	1.8	o	●	●	●	o	●	●	●	●	●	●	○
0.20-0.70	1.9	o	o	o	o	o	o	o	●	●	o	●	o
0.20-0.50	2.6	o	o	o	o	o	o	o	●	●	o	●	o

Range of f_z (mm/t)	Radius for Programming	Applictions							Material				
									P	M	K	S	H
0.20-0.80	1.1	o	●	●	●	○	●	●	●		o	●	○
0.20-1.20	1.8	○	●	●	●	o	●	●	●	●	●	●	○
0.20-0.70	1.9	o	o	o	o	o	o	o	●	●	●	●	
0.30-1.00	2.3	o	o	o	o	o	o	o	●	●	●	●	●
0.40-1.50	2.5	●	○	o	o	o	●	o	●	●	●	●	
0.40-1.50	3.0	●	○	o	o	o	●	o	●		●		●
0.20-0.70	2.6	o	o	o	o	o	o	o	●	●	●	●	o
0.40-1.40	3.1	o	o	o	o	o	o	o	●	●	●	●	o
0.40-1.80	2.8	○	o	●	●	o	●	●	●	●	●	●	o
0.40-2.00	3.1	●	○	o	o	o	●	○	●	●	●	●	o
0.20-0.60	3.3	●	●	o	o	o	o	o	●	●	●	●	o
0.20-0.80	4.1	●	●	o	o	o	o	o	●	●	●	●	o

Range of f_z (mm/t)	Radius for Programming	Applictions							Material				
									P	M	K	S	H
0.20-1.20	1.8	●	●	●	●	o	●	●	●	●	●	●	○
0.30-1.00	2.3	●	●	●	●	o	o	o	●	●	●	●	●
0.40-1.50	2.5	●	o	o	o	o	o	○	●	●	●	●	o
0.40-1.50	3.0	●	o	o	o	o	o	o	●		●		●
0.40-1.40	3.1	o	o	o	o	o	o	o	●	●	●	●	o
0.40-1.80	2.8	○	●	●	●	o	●	●				●	o
0.40-2.00	3.1	●	○	o	o	o	o	○	●	●	●	●	o
0.40-2.00	4.0	●	o	o	o	o	o	o	●		●		●
0.20-1.50	3.6	●	●	●		●		o	●	●	●	●	o
0.20-1.20	4.0	●	●	●	●	o	●	●	●	●	●	●	○
0.20-0.60	3.3	o	o	o	o	o	o	o	●	●	●	●	o
0.40-1.50	3.3 & 3.7 for RM	o	o	o	o	o	o	o	●	●	●	●	o
0.20-0.80	4.1	o	o	o	o	o	o	o	●	●	●	●	o
0.20-1.00	5.0	●	o						●	●	●	●	o
0.10-0.65	5.4	●							●			●	o
0.20-0.80	4.8 & 5.2 for RM	●	●	o	o	o	o	o	●	●	●	●	o

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

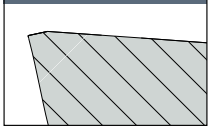
Indexable Fast Feed Family Selector

Diameter range (mm)	Family	Description	APMX (mm)	Available diameters (mm) for configuration	Insert			
				Facemill	Description	Chip former	No. of sideds	No. edges
Ø80-160	NEOFEED	FFQ8 FD	1.5	80-100	FFQ8 SZMU 120520	T, HP	2	8
	HELI6FEED	FF FWX-07	1.5	80-100	H600 WXCU 070515	T, HP	2	6
	TANG4FEED	FFV-D-R-VN07	1.5	80-100	FF VNMT 0706ZN	ER, ETR	2	4
	MILL4FEED	FFQ4-12	1.5	66-125	FFQ4 SOMT 1205	T, T20, RM-T, HP, RM-HP, HP-P	1	4
	MILL4FEED	FFQ4-12	1.2	66-125	FFQ4 SOMW 1205	SOMW	1	4
	LOGIQ4FEED	FFX4 FD-08	2.0	80-125	FFX4 XNMU 080620	T, HP	2	4
	HELI6FEED	FF FWX-08	2.0	66-160	H600 WXCU 0806	T, HP, RM	2	6
	HELI6FEED	MF FWX-07	2.7	80-100	H600 WXCU 070515	T, HP	2	6
	NEOFEED	MFQ8 FD	3.0	80-100	FFQ8 SZMU 120520	T, HP	2	8
	MILL4FEED	FFQ4-17	3.0	80-160	FFQ4 SOMT 1706	T, RM-T, HP, RM-HP	1	4
	MILL4FEED	FFQ4-17	2.5	80-160	FFQ4 SOMW 1706	SOMW	1	4
	HELI12FEED	MF FHX-R06	3.0	80-160	H1200 HXCU 0606	TR, HPR	2	12
	HELI6FEED	MF FWX-08	3.5	66-160	H600 WXCU 0806	T, HP, RM	2	6

(1) MM - Multi-Master Heads

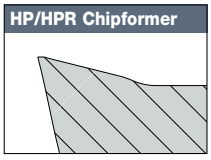
Insert Chipformer Types

T/TR Chipformer



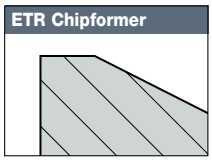
T / TR - For steel, ferritic and martensitic stainless steel, cast iron and hardened steel

HP/HPR Chipformer



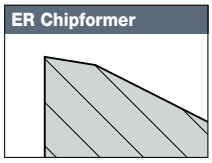
HP / HPR - For austenitic stainless steel and high temperature alloys

ETR Chipformer



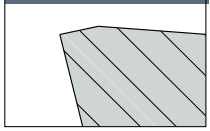
ETR - Tangential insert with reinforced cutting edges for interrupted cut and unfanorable conditions

ER Chipformer



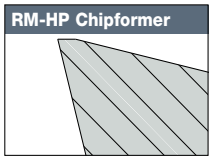
ER - Tangentinal insert for general applictions

RM/RM-T Chipformer



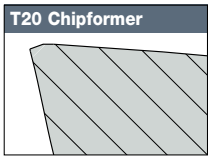
RM / RM-T - For interrupted cut and for machining near straight wall shoulders of steel, ferritic and martensitic stainless steel, cast iron and hardened steel

RM-HP Chipformer



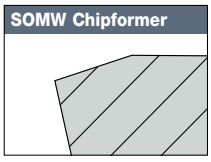
RM-HP - For interrupted cut and for machining near straight wall shoulders of austenitic stainless steel and high temperature alloys

T20 Chipformer



T20 - For gray and nodular cast iron

SOMW Chipformer



SOMW - T flat insert for interrupted and hard material up to 60 HRC

Range of f_z (mm/t)	Radius for Programming	Applictions							Material				
									P	M	K	S	H
0.20-1.50	3.6	●	●	●	o	●	o	o	●	●	●	●	o
0.40-1.40	3.1	●	o	o	o	o	●	o	●	●	●	●	o
0.40-1.80	2.8	●	●	●	●	o	●	●	o	o	o	●	o
0.40-2.00	3.1	●	○	o	o	o	●	o	●	●	●	●	o
0.40-2.00	4.0	●	○	o	o	o	●	o	●		●		●
0.20-1.20	4.0	●	●	●	●	o	●	●	●	●	●	●	○
0.40-1.50	3.3 & 3.7 for RM	o	o	o	o	o	o	o	●	●	●	●	o
0.20-0.80	4.1	●	o	●	o	o	●	●	●	●	●	●	o
0.20-1.00	5.0	●	o						●	●	●	●	o
0.40-2.00	5.5	●	○	o	o	o	●	o	●	●	●	●	o
0.40-2.00	6.4	●	○	○	○	o	○	○	●		●		●
0.10-0.65	5.4	●		o					●				o
0.20-0.80	4.8 & 5.2 for RM	o	o	o	o	o	o	o	●	●	●	●	o

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

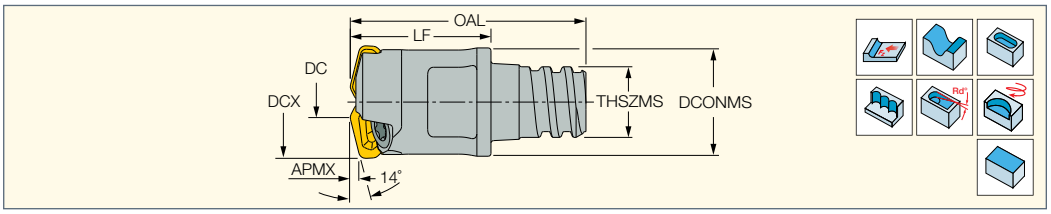
Single-Sided Small Trigon Inserts for Fast Feed Milling

NANO FEED MILL

MULTI-MASTER

FFT3 EFM-MM 02

Small Diameter Endmills with a MULTI-MASTER Threaded Adaptation Carrying 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(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 1.1 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
(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

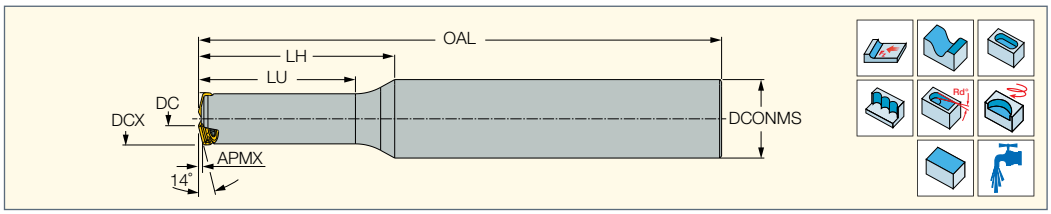
Spare Parts

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

NANO FEED MILL

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)	MIID(8)	TQ(9)	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	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	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	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	FFT3 TXMT 0201205T	0.5	0.06

• Radius for programming 1.1 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
(4) C-Cylindrical
(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

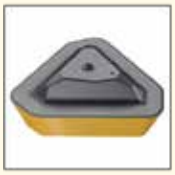
Spare Parts

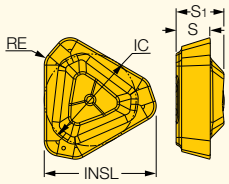
Designation		
FFT3 EFM-02	SR M2X0.4-2.9 T6-HG(a)	T-6/5 MAGNET 3X3

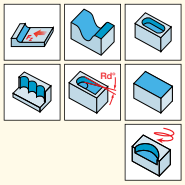
NANO FEED MILL

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	0.20-0.45

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

Recommended Machining Conditions for FFT3-02 Fast Feed Endmills

ISO class DIN/ ISO 513	Workpiece material: Description	ISCAR mat. group*	Hardness, HB	Typical representative: AISI/SAE/ASTM	Typical representative: DIN W.-Nr.	D.O.C. a_p (mm)	Cutting speed v_c, (m/min)	Feed f_z (mm/tooth)	Coolant
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

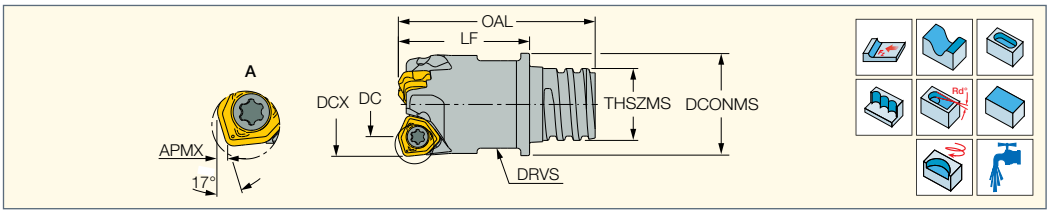
* ISCAR material group in accordance with VDI 3323 standard ** Quenched and tempered
For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

MICRO3FEED MF 300 ENDMILL

MULTI-MASTER

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)	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	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	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	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	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	0.00

• Radius for programming 1.1 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
(4) Torque key size
(5) Maximum ramping angle
(6) Machinable diameter minimum for interpolation
(7) Machinable diameter maximum for interpolation
(8) Master insert identification

Spare Parts

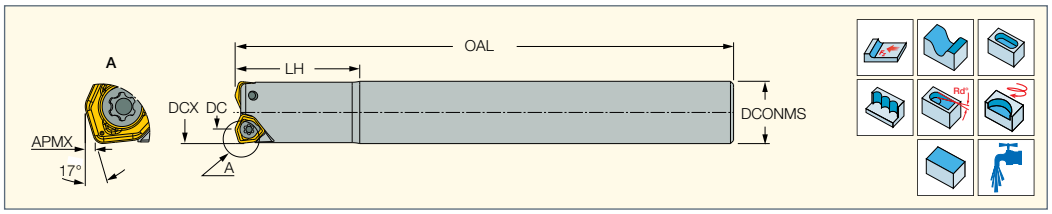
Designation			
FFT3 EFM-MM 03	TS 18041I/HG	TS 18041I/HG(a)	T-6IP/51

(a) Recommended tightening torque: 0.5 (Nm)

MICRO3FEED MF 300 ENDMILL

FFT3 EFM-03

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



Designation	DCX(1)	DC	APMX	AE(2)	CICT(3)	LH	OAL	DCONMS	Shank(4)	RMPX°(5)	MDN(6)	MDX(7)	MIID(8)	kg
FFT3 EFM D08-1-080-C12-03	8.00	3.60	0.60	2.2	1	20.0	80.00	12.00	C	1.1	11.60	15.00	FFT3 WXMT 030206T	0.00
FFT3 EFM D10-2-080-C10-03	10.00	5.60	0.60	2.2	2	20.0	80.00	10.00	C	6.9	15.60	19.00	FFT3 WXMT 030206T	0.11
FFT3 EFM D12-3-120-C12-03	12.00	7.60	0.60	2.2	3	25.0	120.00	12.00	C	4.7	19.60	23.00	FFT3 WXMT 030206T	0.14
FFT3 EFM D16-4-140-C16-03	16.00	11.60	0.60	2.2	4	35.0	140.00	16.00	C	2.9	27.60	31.00	FFT3 WXMT 030206T	0.18
FFT3 EFM D20-5-160-C20-03	20.00	15.60	0.60	2.2	5	43.0	160.00	20.00	C	2.0	35.60	39.00	FFT3 WXMT 030206T	0.37
FFT3 EFM D25-6-180-C25-03	25.00	20.60	0.60	2.2	6	53.0	180.00	25.00	C	1.5	45.60	49.00	FFT3 WXMT 030206T	0.62

• Radius for programming 1.1 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
(4) C-Cylindrical
(5) Maximum ramping angle
(6) Machinable diameter minimum for interpolation
(7) Machinable diameter maximum for interpolation
(8) Master insert identification

Spare Parts

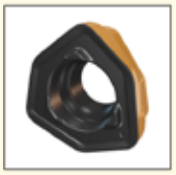
Designation		
FFT3 EFM-03	TS 18041I/HG(a)	T-6IP/51

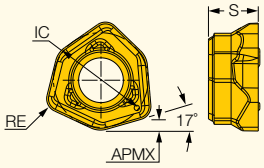
(a) Recommended tightening torque: 0.5 (Nm)

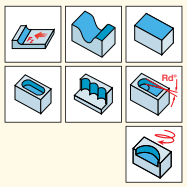
MICRO 3 FEED
MF 300 ENDMILL

FFT3 WXMT 03

Single-Sided Small Trigon
Inserts for Fast Feed Milling







Designation	Dimensions IC	S	RE	APMX	Tough ↔ Hard IC882	IC830	IC5820	IC808	Recommended Machining Data 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

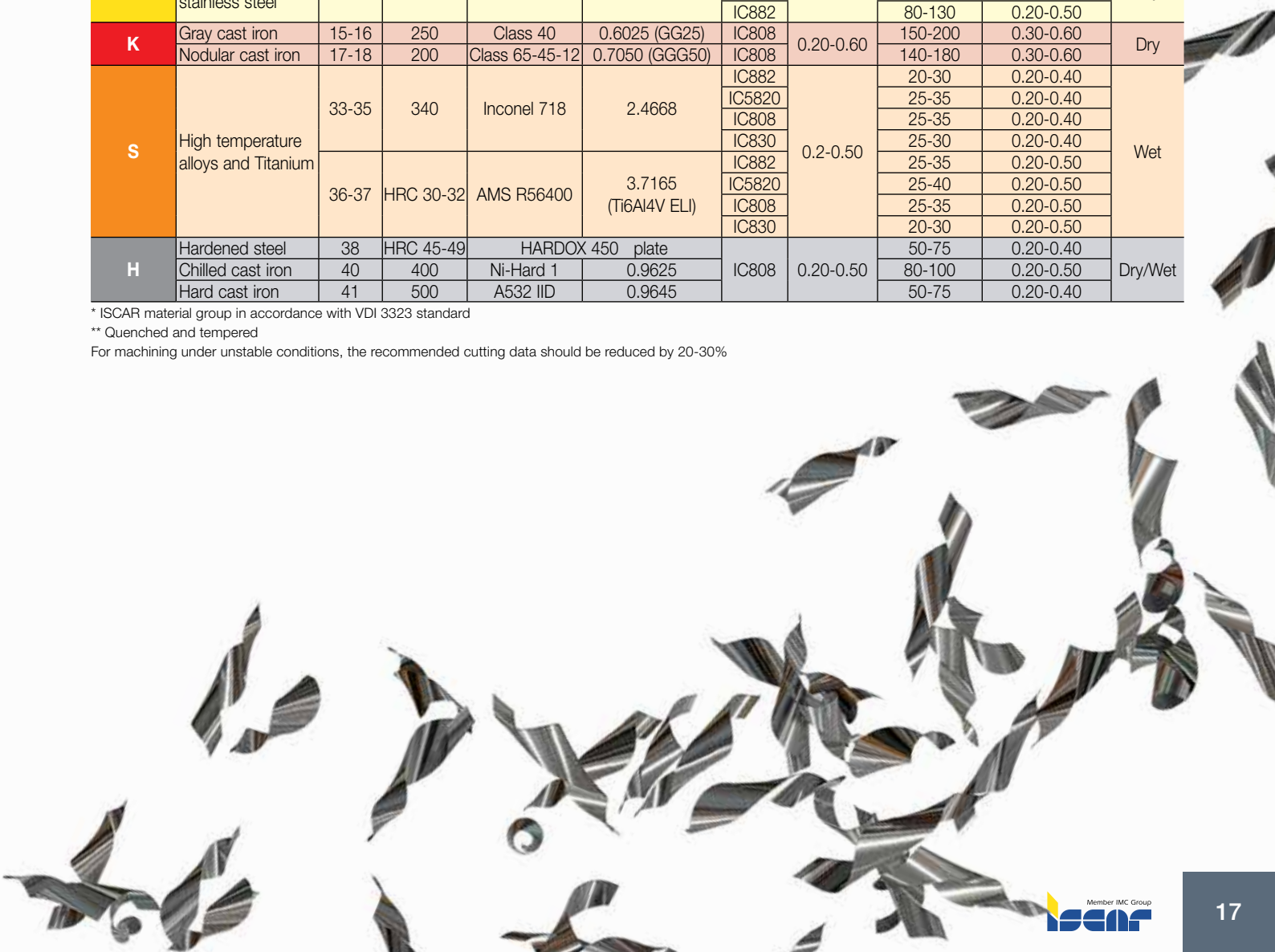
Recommended Machining Conditions for FFT3-03 Fast Feed Endmills

ISO class DIN/ISO 513	Workpiece material: Description	ISCAR mat. group*	Hardness, HB	Typical materials: AISI/SAE/ ASTM	DIN W.-Nr.	Carbide grade	D.O.C. a_p (mm)	Cutting speed v_c (m/min)	Feed f_z (mm/tooth)	Coolant
P	Non-alloy 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 steel	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 alloy steel	10-11	200-220	H13	1.2344	IC808		80-150	0.30-0.60	
						IC830		70-140	0.30-0.60	
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021	IC808		80-150	0.30-0.60	
						IC830		70-140	0.30-0.60	
M	Austenitic stainless 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	15-16	250	Class 40	0.6025 (GG25)	IC808	0.20-0.60	150-200	0.30-0.60	Dry
	Nodular cast iron	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	
	Hard cast iron	41	500	A532 IID	0.9645			50-75	0.20-0.40	

* ISCAR material group in accordance with VDI 3323 standard

** Quenched and tempered

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

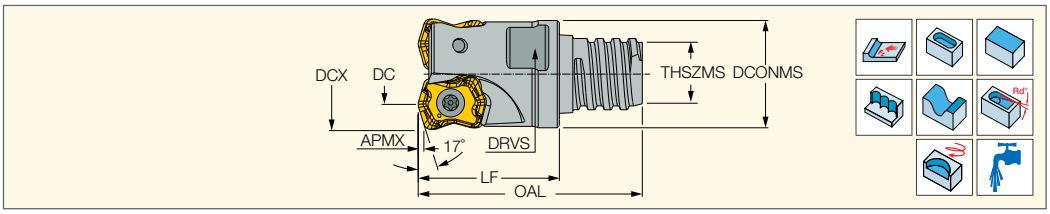


LOGIQ4FEED HIGH FEED MILLING

MULTI-MASTER

FFX4 ED-MM

Endmills with MULTI-MASTER 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(9)	Rg(10)	kg
FFX4 ED16/.63-2-MMT10-04	16.00	8.60	2	0.80	3.7	T10	20.00	31.75	15.20	4.3	24.60	31.00	13.0	FFX4 XNMU 040310T	0.9	1.80	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	1.80	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	1.80	0.14

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

(1) Cutting diameter maximum
(2) Number of inserts
(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) Radius for programming

Spare Parts

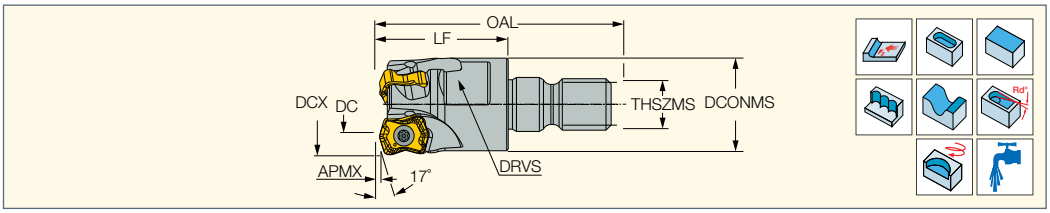
Designation		
FFX4 ED-MM	SR M2.5X6-T7-60	T-7/51

LOGIQ4FEED HIGH FEED MILLING

FLEXFIT

FFX4 ED-M

Endmills with FLEXFIT 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)	Rg(8)	MIID(9)	TQ(10)	TQ_3(11)	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	1.80	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	19.0	1.80	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	1.80	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	1.80	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	1.80	FFX4 XNMU 040310T	0.9	40	0.30

- To generate a straight surface without cusps, the width of cut must not exceed DC • When mounting items with FLEXFIT threaded adaptation to their holders, the mating surfaces and threaded areas must be thoroughly cleaned. Apply appropriate tightening torque to eliminate a gap between the mating faces. Estimated torque values are specified in the TQ_3 parameter

(1) Cutting diameter maximum
(2) Number of inserts
(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) Radius for programming
(9) Master insert identification
(10) Recommended tightening torque (Nm) for insert screw
(11) Tool tightening torque (Nm)

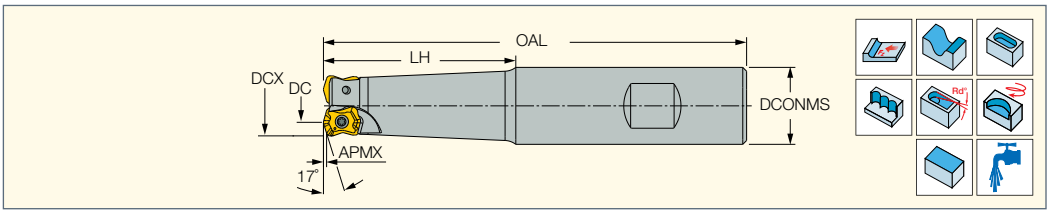
Spare Parts

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

LOGIQ4FEED
HIGH FEED MILLING

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]	LH	KAPR[4]	OAL	DCONMS	RMPX°[5]	MDN[6]	MDX[7]	Shank[8]	Rg[9]	MIID[10]	TQ[11]	kg
FFX4 ED12-1-030-C12-04	12.00	4.60	0.80	3.7	1	30.0	17.0	90.00	12.00	3.6	16.60	23.00	C	1.80	FFX4 XNMU 040310T	0.9	0.07
FFX4 ED16-2-030-C16-04	16.00	8.60	0.80	3.7	2	30.0	17.0	120.00	16.00	4.3	24.60	31.00	C	1.80	FFX4 XNMU 040310T	0.9	0.16
FFX4 ED16-2-050-W20-04	16.00	8.60	0.80	3.7	2	50.0	17.0	110.00	20.00	4.3	24.60	31.00	W	1.80	FFX4 XNMU 040310T	0.9	0.20
FFX4 ED20-3-050-C20-04	20.00	12.60	0.80	3.7	3	50.0	17.0	140.00	20.00	2.7	32.60	39.00	C	1.80	FFX4 XNMU 040310T	0.9	0.29
FFX4 ED20-3-060-W20-04	20.00	12.60	0.80	3.7	3	60.0	17.0	120.00	20.00	2.7	32.60	39.00	W	1.80	FFX4 XNMU 040310T	0.9	0.24
FFX4 ED25-4-060-C25-04	25.00	17.60	0.80	3.7	4	60.0	17.0	150.00	25.00	1.8	42.60	49.00	C	1.80	FFX4 XNMU 040310T	0.9	0.50
FFX4 ED25-4-080-W25-04	25.00	17.60	0.80	3.7	4	80.0	17.0	140.00	25.00	1.8	42.60	49.00	W	1.80	FFX4 XNMU 040310T	0.9	0.45
FFX4 ED32-5-080-W32-04	32.00	24.60	0.80	3.7	5	80.0	17.0	150.00	32.00	1.2	56.60	63.00	W	1.80	FFX4 XNMU 040310T	0.9	0.80
FFX4 ED32-5-120-C32-04	32.00	24.60	0.80	3.7	5	120.0	17.0	205.00	32.00	1.2	56.60	63.00	C	1.80	FFX4 XNMU 040310T	0.9	1.02

- 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
(4) Tool cutting edge angle
(5) Maximum ramping angle
(6) Machinable diameter minimum for interpolation
(7) Machinable diameter maximum for interpolation
(8) C-Cylindrical, W-Weldon
(9) Radius for programming
(10) Master insert identification
(11) Recommended tightening torque (Nm) for insert screw

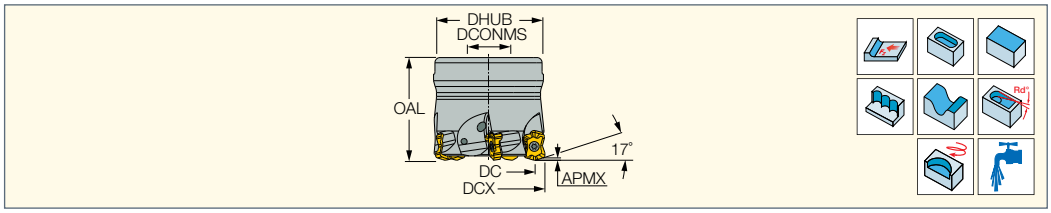
Spare Parts

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

LOGIQ4FEED
HIGH FEED MILLING

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	Rg[7]	MIID[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	1.80	FFX4 XNMU 040310T	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	1.80	FFX4 XNMU 040310T	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	1.80	FFX4 XNMU 040310T	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	1.80	FFX4 XNMU 040310T	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	1.80	FFX4 XNMU 040310T	0.44

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

(1) Cutting diameter maximum
(2) Number of inserts
(3) Maximum plunging width
(4) Maximum ramping angle
(5) Machinable diameter minimum for interpolation
(6) Machinable diameter maximum for interpolation
(7) Radius for programming
(8) Master insert identification

Spare Parts

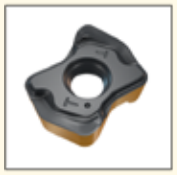
Designation			
FFX4 FD032-5-16-04	SR M2.5X6-T7-60	T-7/51	SR M8X25-D11.5
FFX4 FD040-6-16-04	SR M2.5X6-T7-60	T-7/51	SR M8X25DIN912
FFX4 FD042-6-16-04	SR M2.5X6-T7-60	T-7/51	SR M8X25DIN912
FFX4 FD050-7-22-04	SR M2.5X6-T7-60	T-7/51	SR M10X25 DIN912
FFX4 FD052-7-22-04	SR M2.5X6-T7-60	T-7/51	SR M10X25 DIN912

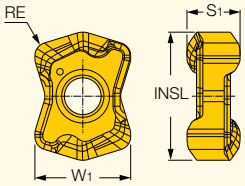
(a) Recommended tightening torque: 2.0 (Nm)

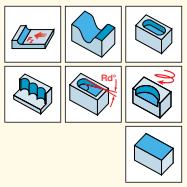
LOGIQ4FEED HIGH FEED MILLING

FFX4 XNMU-04

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

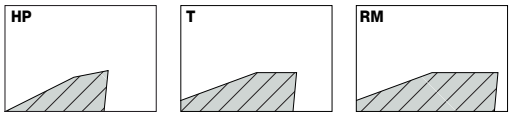






Designation	Dimensions INSL	S1	RE	W1	Tough ↔ Hard IC882	IC840	IC830	IC5820	IC808	IC810	Recommended Machining Data a_p (mm)	f_z (mm/t)
FFX4 XNMU 040310HP	9.58	3.97	1.00	7.16	●	●	●	●			0.20-0.80	0.20-0.80
FFX4 XNMU 040310RM-HP	9.58	3.97	1.00	7.16	●				●		0.20-0.80	0.20-0.80
FFX4 XNMU 040310T	9.58	3.95	1.00	7.16			●		●	●	0.20-0.80	0.40-1.20
FFX4 XNMU 040310RM-T	9.58	3.95	1.00	7.16					●		0.20-0.80	0.40-1.20

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



Average Cutting Data for FFX4 Fast Feed Cutters Size 04

ISO class DIN/ ISO 513	Description	Workpiece material ISCAR mat. group*	Hardness HB	Typical materials AISI/SAE/ ASTM	DIN W.-Nr.	Insert type	Carbide grade	D.O.C. a_p (mm)	Cutting Speed & Feed v_c (m/min)	f_z (mm/tooth)	Coolant
P	Non-alloy steel	1-5	130-180	1020	1.0402	T/ RM-T	IC808	0.2-0.8	150-220	0.2-1.0	Dry
							IC830		140-200	0.2-1.2	Dry/Wet
	Low alloy steel	6-8	260-300	4340	1.6582		IC808		140-200	0.2-0.9	Dry/Wet
							IC830		120-180	0.2-1.1	Dry/Wet
		9	HRC 35-42**	3135	1.5710		IC808		130-180	0.2-0.8	Dry
							IC830		120-160	0.2-1.0	Dry/Wet
	High alloy steel	10-11	200-220	H13	1.2344		IC808		120-170	0.2-0.8	Dry
							IC830		100-150	0.2-0.9	Dry/Wet
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021		IC808		110-160	0.2-0.8	Dry
							IC830		100-150	0.2-0.9	Dry/Wet
M	Austenitic stainless steel	14	200	304L	1.4306	HP/ RM-HP	IC830	0.2-0.8	80-120	0.2-0.9	Wet
							IC840		80-140	0.2-0.8	
							IC5820		100-160	0.2-0.7	
							IC882		80-130	0.2-0.8	
K	Gray cast iron	15-16	250	Class 40	0.6025 (GG25)	T/ RM-T	IC810	0.2-0.8	150-220	0.4-1.2	Dry
	Nodular cast iron	17-18	200	Class 65-45-12	0.7050 (GGG50)		IC810		120-200	0.4-1.2	
S	High temperature alloys and Titanium	33-35	340	Inconel 718	2.4668	HP/ RM-HP	IC882	0.2-0.8	20-30	0.2-0.7	Wet
							IC5820		25-35	0.2-0.6	
							IC840		25-35	0.2-0.6	
							IC830		25-30	0.2-0.7	
		36-37	HRC 30-32	AMS R56400	3.7165 (Ti6Al4V ELI)		IC882		25-35	0.2-0.7	
							IC5820		25-40	0.2-0.6	
							IC840		25-35	0.2-0.6	
							IC830		20-30	0.2-0.7	
H	Hardened steel	38	HRC 45-49	HARDOX 450 plate		T/ RM-T	IC808	0.2-0.8	50-75	0.2-0.5	Dry

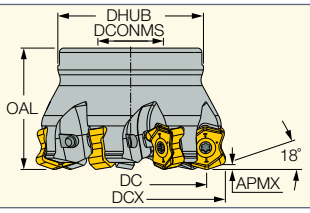
* ISCAR material group in accordance with VDI 3323 standard ** Quenched and tempered

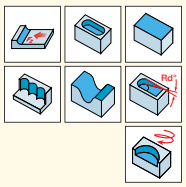
For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

LOGIQ4FEED
HIGH FEED MILLING

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	Rg(5)	MIID(6)	kg
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	4.00	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	4.00	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	4.00	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	4.00	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	4.00	FFX4 XNMU 080620T	2.40

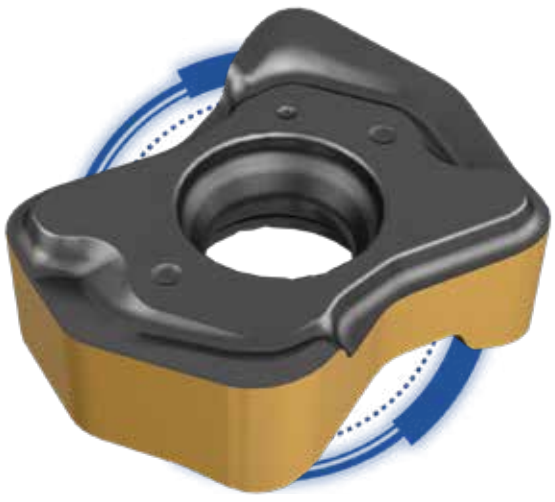
- To generate a straight surface without cusps, the width of cut must not exceed DC

(1) Cutting diameter maximum
(2) Number of inserts
(3) Machinable diameter minimum for interpolation
(4) Machinable diameter maximum for interpolation
(5) Radius for programming
(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	

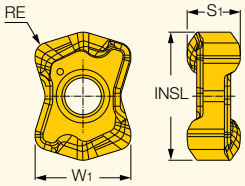
(a) Recommended tightening torque: 9.0 (Nm)

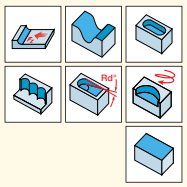


LOGIQ4FEED HIGH FEED MILLING

FFX4 XNMU-08

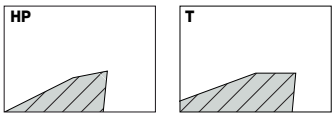
"Bone Shaped" Inserts with 4 Cutting Edges for Fast Feed Milling





Designation	Dimensions INSL	S1	RE	W1	Tough ↔ Hard IC882	IC830	IC808	IC810	Recommended Machining Data 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: ISO class DIN/ISO 513	Description	ISCAR mat. group*	Hardness HB	Typical representative: AISI/SAE/ASTM	DIN W.-Nr.	Insert type	Carbide grade	D.O.C. a_p (mm)	Cutting speed v_c (m/min)	Feed f_z (mm/tooth)	Coolant
P	Non-alloy steel	1-5	130-180	1020	1.0402	T	IC808	0.50-2.0	150-180	0.40-1.20	Dry
							IC830		150-180	0.40-1.20	Dry/Wet
	Low alloy steel	6-8	260-300	4340	1.6582		IC808		150-180	0.40-1.20	Dry/Wet
							IC830		120-180	0.40-1.10	Dry/Wet
		9	HRC 35-42**	3135	1.5710		IC808		130-180	0.40-1.10	Dry
							IC830		120-160	0.40-1.00	Dry/Wet
	High alloy steel	10-11	200-220	H13	1.2344		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	1.4021		IC808		110-160	0.40-0.80	Dry
							IC830		100-150	0.40-0.90	Dry/Wet
M	Austenitic stainless steel	14	200	304L	1.4306	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
							IC808		40-80	0.20-0.70	
							IC830		40-75	0.20-0.70	
		33-35	340	Inconel 718	2.4668		IC882		20-30	0.20-0.70	
							IC808		25-40	0.20-0.70	
							IC830		25-35	0.20-0.70	
		36-37	30-32	AMS R56400	3.7165 (Ti6Al4V ELI)		IC882		30-50	0.20-0.70	
							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

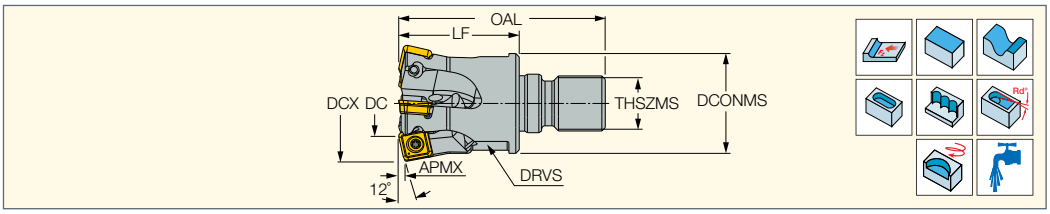
* ISCAR material group in accordance with VDI 3323 standard ** Quenched and tempered

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

MILL4FEED

FFQ4 D-M-09

Fast Feed Endmills with FLEXFIT 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(9)	TQ_3(10)	kg
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	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	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	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	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	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	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	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
(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 (Nm)

Spare Parts

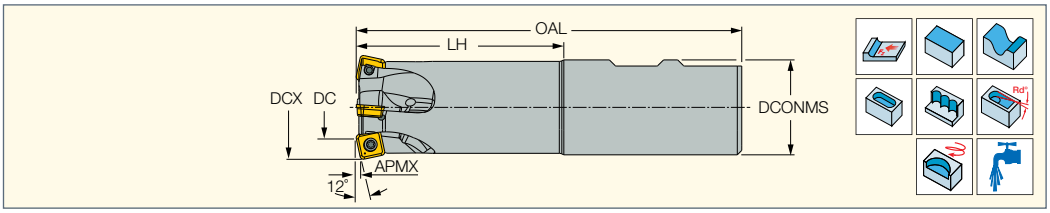
Designation		
FFQ4 D-M-09	SR M3X0.5-L7.4 IP9(a)	IP-9/151

(a) Recommended tightening torque: 2.0 (Nm)

MILL4FEED

FFQ4 D-W-09

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



Designation	DC	DCX(1)	APMX	AE(2)	CICT(3)	LU	LH	DCONMS	OAL	RMPX°(4)	MDN(5)	MDX(6)	MIID(7)	TQ(8)	kg
FFQ4 D022-2-044-W20-09	7.70	22.00	1.20	7.1	2	-	44.0	20.00	94.00	8.2	29.70	43.00	FFQ4 SOMT 090412T	2.0	0.19
FFQ4 D025-3-050-W25-09	10.70	25.00	1.20	7.1	3	-	50.0	25.00	110.00	5.5	35.70	49.00	FFQ4 SOMT 090412T	2.0	0.25
FFQ4 D032-4-064-W25-09	17.70	32.00	1.20	7.1	4	-	64.0	25.00	120.00	3.2	49.70	63.00	FFQ4 SOMT 090412T	2.0	0.50
FFQ4 D035-5-070-W32-09	20.70	35.00	1.20	7.1	5	68.50	70.0	32.00	130.00	2.7	55.70	69.00	FFQ4 SOMT 090412T	2.0	0.70

• 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
(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

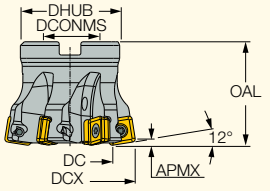
Spare Parts

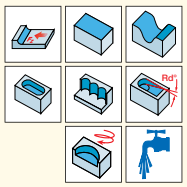
Designation		
FFQ4 D-W-09	SR M3X0.5-L7.4 IP9(a)	IP-9/151

MILL4FEED

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)	MDN(5)	MDX(6)	Arbor	kg	MIID(7)	TQ(8)
FFQ4 D40-05-16-09	25.70	40.00	1.20	7.1	5	35.00	16.00	38.00	2.0	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	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	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	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 • 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
(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

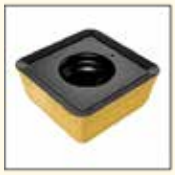
Spare Parts

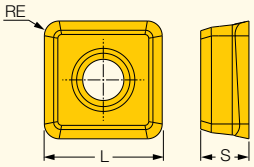
Designation			
FFQ4 D40-05-16-09	SR M3X0.5-L7.4 IP9(a)	IP-9/151	SR M8X25DIN912
FFQ4 D50-07-22-09	SR M3X0.5-L7.4 IP9(a)	IP-9/151	SR M10X25 DIN912
FFQ4 D52-07-22-09	SR M3X0.5-L7.4 IP9(a)	IP-9/151	SR M10X25 DIN912
FFQ4 D63-08-22-09	SR M3X0.5-L7.4 IP9(a)	IP-9/151	SR M10X30 DIN912

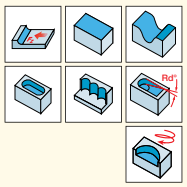
MILL4FEED

FFQ4 SOMT/W 0904

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

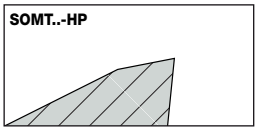


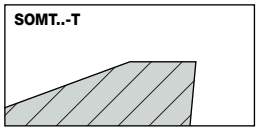


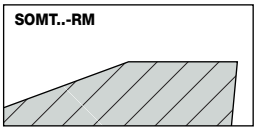


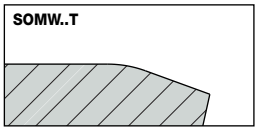
Designation	Dimensions L	S	RE	Tough ↔ Hard IC882	IC830	IC5820	IC808	IC810	Recommended Machining Data a_p (mm)	f_z (mm/t)
FFQ4 SOMT 090412T	8.50	3.90	1.20		●		●	●	0.50-1.20	0.40-1.50
FFQ4 SOMT 0904RM-T	8.60	3.80	1.20				●		0.50-1.20	0.40-1.50
FFQ4 SOMT 0904RM-HP	8.60	3.80	1.20	●					0.50-1.20	0.40-1.50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

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









Average Cutting Data for FFQ4 Size 09 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 AISI/SAE/ ASTM	Typical representative DIN W.-Nr.			Recom-mended	Range		Recom-mended	Range	
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
							IC830			140-200	1.3	0.5-1.5	Dry/Wet
	Low alloy steel	6-8	260-300	4340	1.6582		IC808			140-200	1.2	0.5-1.5	Dry
							IC830			120-180	1.3	0.5-1.5	Dry/Wet
		9	HRC 35-42	3135	1.5710		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
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021		IC808			110-160	1.2	0.5-1.4	Dry
							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	
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	
		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	
							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	

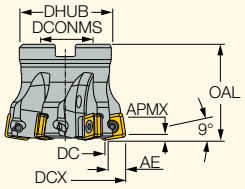
* ISCAR material group in accordance with VDI 3323 standard ** Quenched and tempered

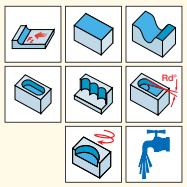
For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

MILL4FEED

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]	MIID[7]	TQ[8]	kg
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	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	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	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	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	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	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	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	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	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	FFQ4 SOMT 120516HP	4.8	2.17

• To generate a straight surface without cusps, the width of cut must not exceed DC • Radius for programming: for insert SOMT 3 mm, for insert SOMW 4 mm • When mounting insert SOMW, APMX=1.2 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
[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

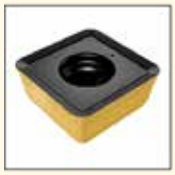
Spare Parts

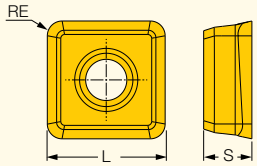
Designation					
FFQ4 D040-3-16-12	SR M4X0.7-L9.6 IP15	SW6-T	BLD IP15/S7		SR PS 118-0416
FFQ4 D040-4-16-12	SR M4X0.7-L9.6 IP15	SW6-T	BLD IP15/S7		SR PS 118-0416
FFQ4 D050-4-22-12	SR M4X0.7-L9.6 IP15	SW6-T	BLD IP15/S7	SR M10X35 DIN912	
FFQ4 D050-5-22-12	SR M4X0.7-L9.6 IP15	SW6-T-SH	BLD IP15/S7	SR M10X35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

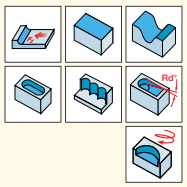
MILL4FEED

FFQ4 SOMT/W 1205

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

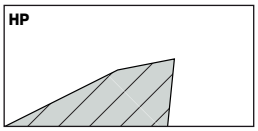


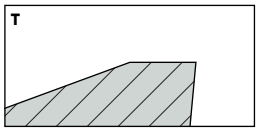


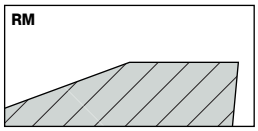


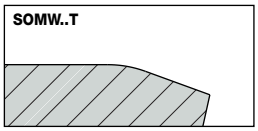
Designation	Dimensions L	S	RE	Tough ↔ Hard IC28	IC830	IC5820	IC808	IC810	IC882	Recommended Machining Data a_p (mm)	f_z (mm/t)
FFQ4 SOMT 1205RM-HP	12.70	5.20	1.60		●				●	0.50-1.50	0.40-1.80
FFQ4 SOMT 1205RM-T	12.70	5.20	1.60				●			0.50-1.50	0.40-2.00
FFQ4 SOMT 120516HP	12.70	5.20	1.60		●	●	●		●	0.50-1.50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

• For side plunging, the initial cutting feed is 0.1 mm/t • T- for steel, ferritic and martensitic stainless steel and cast iron • RM-.. type for interrupted cut and machining near straight shoulders wall • HP-for austenitic stainless steel and high temperature alloys • HP-P - Positive rake face, used for aluminum • T20- for grey and nodular cast iron • SOMW-T flat insert for interrupted and hard material up to 60 HRC









Average Cutting Data for FFQ4 Size 12 Fast Feed Cutters

ISO class DIN/ ISO 513	Workpiece Material: Description	ISCAR mat. group*	Hardness HB	Typical representative: AISI/SAE/ ASTM	DIN W.-Nr.	Insert type	Carbide grade	D.O.C. a_p (mm): Recom-mended	Range	Cutting speed v_c, (m/min)	Feed f_z (mm/tooth): Recom-mended	Range	Coolant
P	Non-alloy 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 steel	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 alloy 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
	Ferritic/martensitic stainless 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	Austenitic stainless 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	
							IC5820			100-160		0.5-1.6	
							IC882			80-130		0.5-1.8	
K	Gray cast iron	15-16	250	Class 40	0.6025 (GG25)	T20 / RM-T	IC810	1.5	0.4-1.5	150-220	1.5	0.5-2.0	Dry
	Nodular cast iron	17-18	200	Class 65-45-12	0.7050 (GGG50)		IC810			120-200		0.5-2.0	
S	High temperature alloys and Titanium	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		0.5-1.0	
							IC808			35-60	0.6	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	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	

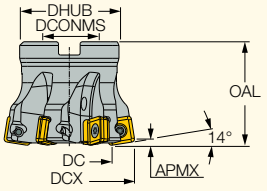
* ISCAR material group in accordance with VDI 3323 standard

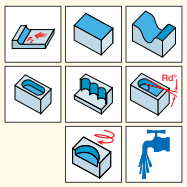
For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

MILL4FEED

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	Da	DHUB	RMPX°(4)	MDN(5)	MDX(6)	CSP(7)	Arbor	MIID(8)	TQ(9)	kg
FFQ4 D080-06-27-17	80.00	50.80	3.00	14.6	6	50.00	27.00	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	50.00	32.00	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	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	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
(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

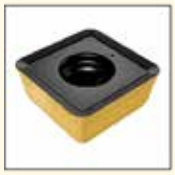
Spare Parts

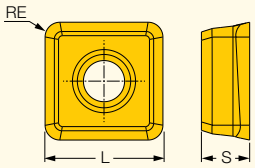
Designation				
FFQ4 D080-06-27-17	SR M5-14 IP20	SW6-T	BLD IP20/S7	SR M12X30DIN912
FFQ4 D100-07-32-17	SR M5-14 IP20	SW6-T	BLD IP20/S7	SR M16X30 DIN912
FFQ4 D125-08-40-17	SR M5-14 IP20	SW6-T	BLD IP20/S7	
FFQ4 D160-10-40-17	SR M5-14 IP20	SW6-T	BLD IP20/S7	

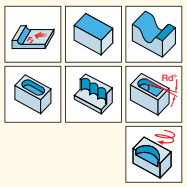
MILL4FEED

FFQ4 SOMT/W 1706

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

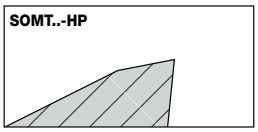


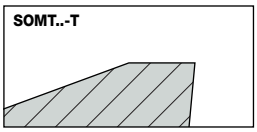


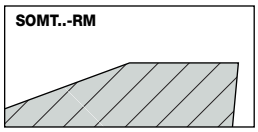


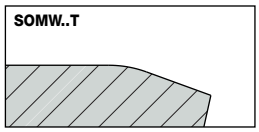
Designation	Dimensions L	S	RE	Tough ↔ Hard IC882	IC830	IC808	IC810	Recommended Machining Data a_p (mm)	f_z (mm/t)
FFQ4 SOMT 1706RM-HP	17.50	6.00	2.50		•			1.20-2.50	0.40-1.20
FFQ4 SOMT 1706RM-T	17.50	6.00	2.50			•		1.20-3.00	0.40-2.00
FFQ4 SOMT 170625HP	17.50	6.00	2.50	•	•	•		1.20-3.00	0.40-1.50
FFQ4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

• For side plunging, the initial cutting feed is 0.1 mm/t • T type for steel, ferritic and martensitic stainless steel, cast iron and hardened steel • RM-.. type for interrupted cut and machining near straight shoulders wall • HP type for austenitic stainless steel and high temperature alloys • SOMW-T flat insert for interrupted and hard material up to 60 HRC









Average Cutting Data for FFQ4 Size 17 Fast Feed Cutters

Workpiece Material: ISO class DIN/ ISO 513	Description	ISCAR mat. group*	Hardness HB	Typical representative: AISI/SAE/ ASTM	DIN W.-Nr.	Insert type	Carbide grade	D.O.C. a_p (mm): Recom-mended	Range	Cutting speed v_c, (m/min)	Feed f_z (mm/tooth): Recom-mended	Range	Coolant
P	Non-alloy 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 steel	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 alloy 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
	Ferritic/martensitic stainless 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	Austenitic stainless steel	14	200	304L	1.4306	HP/ RM-HP	IC830	2.0	0.4-3.0	80-120	1.0	0.5-1.5	Wet
							IC808			100-160		0.5-1.5	
							IC5820			100-160		0.5-1.6	
							IC882			80-130		0.5-1.8	
K	Gray cast iron	15-16	250	Class 40	0.6025 (GG25)	T/ RM-T	IC810	3.0	0.4-3.0	150-220	1.5	0.5-2.0	Dry
	Nodular cast iron	17-18	200	Class 65-45-12	0.7050 (GGG50)		IC810			120-200		0.5-2.0	
S	High temperature alloys and Titanium	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	
		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	
							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	

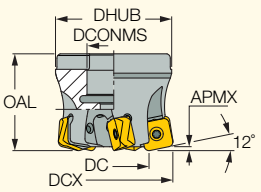
* ISCAR material group in accordance with VDI 3323 standard

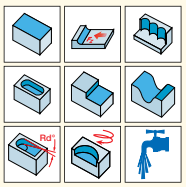
For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

NEOFEED HIGH FEED LINE

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)	TQ(6)	MIID(7)	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	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	4.8	FFQ8 SZMU 120520	0.94
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	4.8	FFQ8 SZMU 120520	1.00
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	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	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
(3) Maximum ramping angle
(4) Machinable diameter minimum for interpolation
(5) Machinable diameter maximum for interpolation
(6) Recommended tightening torque (Nm) for insert screw
(7) Master insert identification

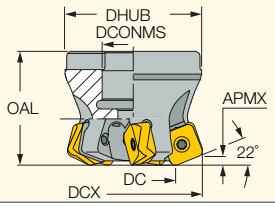
Spare Parts

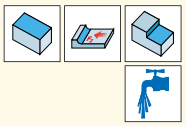
Designation				
FFQ8 D050-05-22-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M10X25 DIN912
FFQ8 D063-06-22-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M10X25 DIN912
FFQ8 D066-06-27-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M12X30DIN912
FFQ8 D080-07-27-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7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

NEOFEED HIGH FEED LINE

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	TQ(3)	MIID(4)	kg
MFQ8 D050-05-22-12	31.60	50.00	3.00	5	40.00	48.00	22.00	A	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	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	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	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
(3) Recommended tightening torque (Nm) for insert screw
(4) Master insert identification

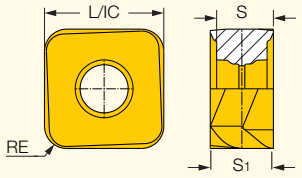
Spare Parts

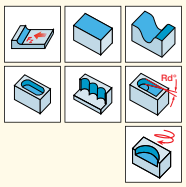
Designation				
MFQ8 D050-05-22-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M10X40-1638
MFQ8 D063-06-22-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M10X25 DIN912
MFQ8 D080-07-27-12	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M12X30DIN912
MFQ8 D100-08-32-12	SR M4X0.7-L11.5 IP15	BLD IP15/M7	SW6-T-SH	

NEOFEED
HIGH FEED LINE

FFQ8 SZMU

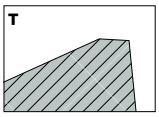
Double-Sided Square
Inserts with 8 Cutting Edges
for High Feed Milling

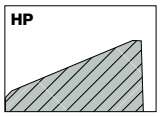




Designation	Dimensions L	S	S1	RE	Tough ↔ Hard IC882	IC830	IC808	IC810	Recommended Machining Data f_z (mm/t)
FFQ8 SZMU 120520HP	12.00	5.85	6.50	2.00	●	●	●		0.20-1.50
FFQ8 SZMU 120520T	12.00	5.85	6.50	2.00		●	●	●	0.40-1.50

• 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 ISO class DIN/ ISO 513	Description	ISCAR mat. group*	Hardness HB	Typical representative AISI/SAE/ ASTM	DIN W.-Nr.	Insert type	Carbide grade	Cutting speed v_c (m/min)	Fast feed (FF) D.O.C a_p (mm)	Feed f_z (mm/tooth)	Moderate feed (MF) D.O.C a_p (mm)	Feed f_z (mm/tooth)	Coolant
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
							IC830	140-200		0.40-1.5		0.20-1.0	Dry/Wet
	Low alloy steel	6-8	260-300	4340	1.6582		IC808	140-200		0.40-1.5		0.20-1.0	Dry/Wet
							IC830	120-180		0.40-1.5		0.20-1.0	Dry/Wet
		9	35-42** HRC	3135	1.5710		IC808	130-180		0.40-1.5		0.20-1.0	Dry
							IC830	120-160		0.40-1.5		0.20-1.0	Dry/Wet
	High alloy steel	10-11	200-220	H13	1.2344		IC808	120-170		0.40-1.5		0.20-1.0	Dry
							IC830	100-150		0.40-1.5		0.20-1.0	Dry/Wet
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021		IC808	110-160		0.40-1.5		0.20-1.0	Dry
							IC830	100-150		0.40-1.5		0.20-1.0	Dry/Wet
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
							IC808	40-80		0.20-0.8		0.20-0.5	
							IC830	40-75		0.20-0.8		0.20-0.5	
		33-35	340	Inconel 718	2.4668		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	
		36-37	30-32 HRC	AMS R56400	3.7165		IC882	30-50		0.20-0.8		0.20-0.5	
							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

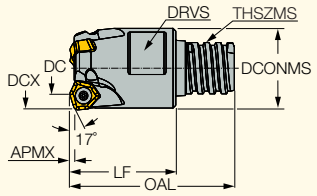
* ISCAR material group in accordance with VDI 3323 standard
** Quenched and tempered
For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

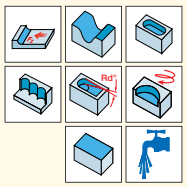
HELI6FEED UPFEED LINE

MULTI-MASTER

FF EWX-MM

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





Designation	DCX(1)	DC	APMX	CICT(2)	THSZMS	LF	OAL	DCONMS	DRVS(3)	TQ(4)	RMPX°(5)	MDN(6)	MDX(7)	MIID(8)	kg
FF EWX D16-2-MMT10-04	16.00	8.60	0.80	2	T10	19.50	31.25	15.20	12.0	0.9	5.0	24.60	31.00	H600 WXCU 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	0.9	4.8	32.60	39.00	H600 WXCU 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	0.9	3.3	42.60	49.00	H600 WXCU 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	2.0	5.0	40.00	49.00	H600 WXCU 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
(3) Width across flats (wrench should be ordered separately)
(4) Recommended tightening torque (Nm) for insert screw
(5) Maximum ramping angle
(6) Machinable diameter minimum for interpolation
(7) Machinable diameter maximum for interpolation
(8) Master insert identification

Spare Parts

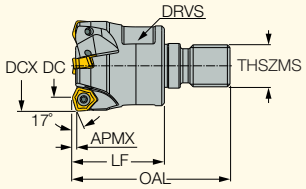
Designation		
FF EWX D16-2-MMT10-04	SR M2.5X6-T7-60	T-7/51
FF EWX D20-3-MMT12-04	SR M2.5X6-T7-60	T-7/51
FF EWX D25-4-MMT15-04	SR M2.5X6-T7-60	T-7/51
FF EWX D25-3-MMT15-05	SR 10508600	T-9/51

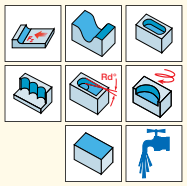
HELI6FEED UPFEED LINE

FLEXFIT

FF EWX-M

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





Designation	DCX(1)	DC	APMX	CICT(2)	LF	OAL	THSZMS	RMPX°(3)	MDN(4)	MDX(5)	DRVS(6)	MIID(7)	TQ(8)	TQ_3(9)	kg
FF EWX D20-3-M10-04	20.00	12.60	0.80	3	25.00	45.00	M10	4.8	32.60	39.00	15.0	H600 WXCU 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	42.60	49.00	19.0	H600 WXCU 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	40.00	49.00	19.0	H600 WXCU 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	54.00	63.00	25.0	H600 WXCU 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	60.00	69.00	25.0	H600 WXCU 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	70.00	79.00	25.0	H600 WXCU 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	51.00	63.00	25.0	H600 WXCU 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	67.00	79.00	25.0	H600 WXCU 070515HP	4.8	40	0.24

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

(1) Cutting diameter maximum
(2) Number of inserts
(3) Maximum ramping angle
(4) Machinable diameter minimum for interpolation
(5) Machinable diameter maximum for interpolation
(6) Clamping wrench size
(7) Master insert identification
(8) Recommended tightening torque (Nm) for insert screw
(9) Tool tightening torque (Nm)

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

HELI6FEED UPFEED LINE

FF EWX

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

Fig. 1

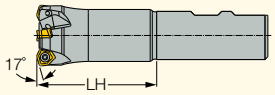
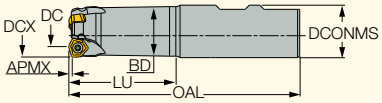
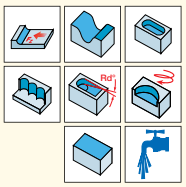


Fig. 2





Designation	DCX[1]	DC	APMX	CICT[2]	BD	LU	LH	OAL	DCONMS	Shank[3]	RMPX°[4]	MDN[5]	MDX[6]	Fig.	MIID[7]	TQ[8]	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	24.60	31.00	2	H600 WXCU 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	24.60	31.00	2	H600 WXCU 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	24.60	31.00	2	H600 WXCU 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	24.60	31.00	2	H600 WXCU 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	24.60	31.00	2	H600 WXCU 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	32.60	39.00	2	H600 WXCU 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	32.60	39.00	2	H600 WXCU 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	32.60	39.00	2	H600 WXCU 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	32.60	39.00	2	H600 WXCU 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	32.60	39.00	2	H600 WXCU 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	40.00	49.00	2	H600 WXCU 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	40.00	49.00	2	H600 WXCU 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	40.00	49.00	2	H600 WXCU 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	40.00	49.00	2	H600 WXCU 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	40.00	49.00	2	H600 WXCU 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	54.00	63.00	1	H600 WXCU 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	54.00	63.00	1	H600 WXCU 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	54.00	63.00	2	H600 WXCU 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	54.00	63.00	2	H600 WXCU 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	54.00	63.00	1	H600 WXCU 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	54.00	63.00	2	H600 WXCU 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	54.00	63.00	2	H600 WXCU 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	54.00	63.00	2	H600 WXCU 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	70.00	79.00	1	H600 WXCU 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	70.00	79.00	1	H600 WXCU 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	70.00	79.00	1	H600 WXCU 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	70.00	79.00	2	H600 WXCU 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	51.00	63.00	2	H600 WXCU 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	51.00	63.00	2	H600 WXCU 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	51.00	63.00	2	H600 WXCU 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	51.00	63.00	2	H600 WXCU 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	77.00	79.00	1	H600 WXCU 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
[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

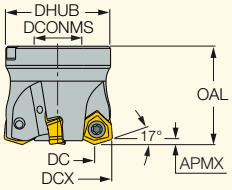
Spare Parts

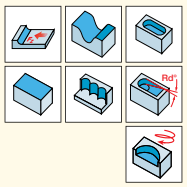
Designation				
FF EWX D...-04	SR M2.5X6-T7-60	T-7/51		
FF EWX D...-05	SR 10508600	T-9/51		
FF EWX D...-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH

HELI6FEED UPFEED LINE

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(3)	RMPX°(4)	MDN(5)	MDX(6)	CSP(7)	MIID(8)	TQ(9)	kg
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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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
(3) For adaptation options, see page
(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

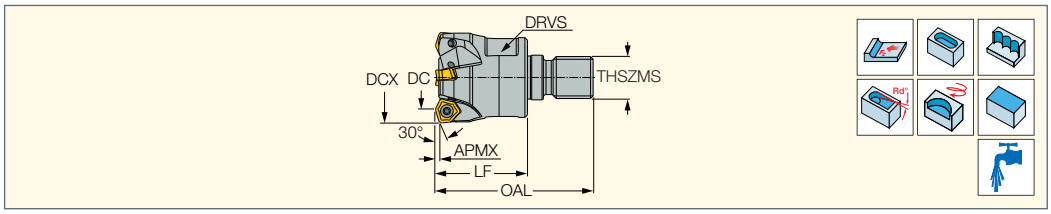
Designation					
FF FWX D040-05-16-05	SR 10508600	T-9/51			SR M8X25DIN912
FF FWX D050-06-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
FF FWX D052-06-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
FF FWX D040-04-16-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	SR M8X25-D11.5
FF FWX D050-05-22-07	SR 34-535-SN		BLD 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	

HELI 6 FEED UPFEED LINE

FLEXFIT

MF EWX-M

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



Designation	DCX[1]	DC	APMX	CICT[2]	LF	OAL	THSZMS	DRVS[3]	RMPX°[4]	MDN[5]	MDX[6]	MIID[7]	TQ[8]	TQ_3[9]	kg
MF EWX D20-3-M10-04	20.00	13.00	1.50	3	28.00	48.00	M10	14.0	2.4	33.00	39.00	H600 WXCU 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	43.00	49.00	H600 WXCU 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	40.50	49.00	H600 WXCU 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	54.50	63.00	H600 WXCU 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	51.70	63.00	H600 WXCU 070515HP	4.8	40	0.15

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

(1) Cutting diameter maximum
(2) Number of inserts
(3) Clamping wrench size
(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
(9) Tool tightening torque (Nm)

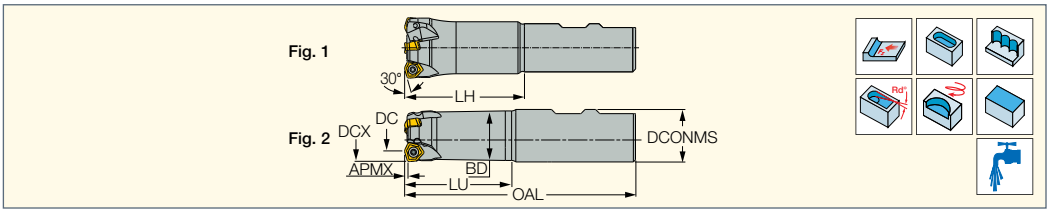
Spare Parts

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

HELI 6 FEED UPFEED LINE

MF EWX

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



Designation	DCX[1]	DC	APMX	CICT[2]	LU	LH	OAL	DCONMS	Shank[3]	BD	RMPX°[4]	MDN[5]	MDX[6]	Fig.	MIID[7]	TQ[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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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 WXCU 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
(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

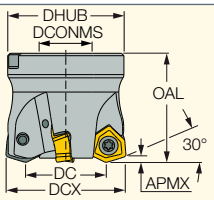
Spare Parts

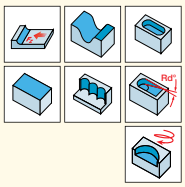
Designation				
MF EWX D16-2-040-W20-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D20-3-050-C20-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D20-3-050-W20-04	SR M2.5X6-T7-60	T-7/51		
MF EWX D25-3-060-W25-05	SR 10508600	T-9/51		
MF EWX D32-4-080-W32-05	SR 10508600	T-9/51		
MF EWX D32-3-080-C32-07	SR 34-535-SN		BLD T15/S7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

HELI6FEED UPFEED LINE

MF FWX

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





Designation	DC	DCX(1)	APMX	CICT(2)	OAL	DHUB	DCONMS	Arbor(3)	RMPX°(4)	MDN(5)	MDX(6)	CSP(7)	MIID(8)	TQ(9)	kg
MF FWX D040-05-16-05	30.60	40.00	2.00	5	35.00	38.00	16.00	A	1.4	70.60	79.00	1	H600 WXCU 05T312T	2.0	0.17
MF FWX D050-06-22-05	40.50	50.00	2.00	6	40.00	48.00	22.00	A	1.0	90.50	99.00	1	H600 WXCU 05T312T	2.0	0.30
MF FWX D052-06-22-05	42.50	52.00	2.00	6	40.00	48.00	22.00	A	1.0	94.50	103.00	1	H600 WXCU 05T312T	2.0	0.32
MF FWX D063-08-22-05	53.50	63.00	2.00	8	40.00	48.00	22.00	A	0.8	116.50	125.00	1	H600 WXCU 05T312T	2.0	0.41
MF FWX D040-04-16-07	27.70	40.00	2.70	4	35.00	38.00	16.00	A	2.0	67.70	79.00	1	H600 WXCU 070515HP	4.8	0.17
MF FWX D050-05-22-07	37.70	50.00	2.70	5	40.00	48.00	22.00	A	1.4	87.70	99.00	1	H600 WXCU 070515HP	4.8	0.31
MF FWX D052-05-22-07	39.70	52.00	2.70	5	40.00	48.00	22.00	A	1.3	91.70	103.00	1	H600 WXCU 070515HP	4.8	0.32
MF FWX D063-06-22-07	50.70	63.00	2.70	6	40.00	48.00	22.00	A	1.0	113.70	125.00	1	H600 WXCU 070515HP	4.8	0.42
MF FWX D080-07-32-07	67.70	80.00	2.70	7	55.00	76.00	32.00	A	0.8	147.70	159.00	1	H600 WXCU 070515HP	4.8	1.21
MF FWX D100-08-32-07	87.70	100.00	2.70	8	50.00	78.00	32.00	B	0.6	187.70	199.00	1	H600 WXCU 070515HP	4.8	1.46
MF FWX D050-04-22-08	34.70	50.00	3.50	4	45.00	48.00	22.00	A	2.5	84.70	99.00	1	H600 WXCU 080612T	9.0	0.32
MF FWX D063-05-27-08	47.70	63.00	3.50	5	50.00	61.00	27.00	A	1.7	110.70	125.00	1	H600 WXCU 080612T	9.0	0.63
MF FWX D066-05-27-08	50.70	66.00	3.50	5	50.00	61.00	27.00	A	1.7	116.70	131.00	1	H600 WXCU 080612T	9.0	0.64
MF FWX D080-06-32-08	64.70	80.00	3.50	6	55.00	76.00	32.00	A	1.2	144.70	159.00	1	H600 WXCU 080612T	9.0	1.13
MF FWX D100-07-32-08	84.70	100.00	3.50	7	50.00	78.00	32.00	B	0.9	184.70	199.00	1	H600 WXCU 080612T	9.0	1.37
MF FWX D125-09-40-08	109.70	125.00	3.50	9	55.00	90.00	40.00	B	0.7	234.70	249.00	1	H600 WXCU 080612T	9.0	2.36
MF FWX D160-11-40-08	144.70	160.00	3.50	11	55.00	95.00	40.00	C	0.5	304.70	319.00	0	H600 WXCU 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
(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

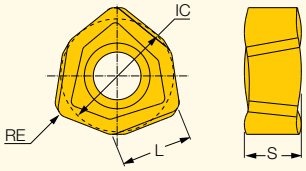
Designation					
MF FWX D040-05-16-05	SR 10508600	T-9/51			SR M8X25DIN912
MF FWX D050-06-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
MF FWX D052-06-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
MF FWX D063-08-22-05	SR 10508600	T-9/51			SR M10X25 DIN912
MF FWX D040-04-16-07	SR 34-535-SN		BLD T15/S7	SW6-T-SH	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 D066-05-27-08	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	

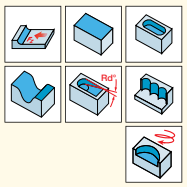
HELI6FEED UPFEED LINE

FEEDMILL

H600 WXCU

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

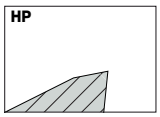


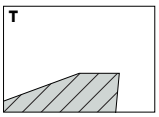


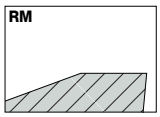
Designation	Dimensions IC	L	S	RE(1)	Tough ↔ Hard IC882	IC330	IC830	IC5820	IC380	IC808	IC810
H600 WXCU 040310HP	6.25	4.13	3.10	0.96	●	●	●				
H600 WXCU 040310T	6.25	4.13	3.10	0.96			●			●	
H600 WXCU 05T312HP	8.33	5.50	4.20	1.20	●	●	●	●			
H600 WXCU 05T312T	8.33	5.50	4.20	1.20			●			●	●
H600 WXCU 070515HP	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

(1) Radius for programming







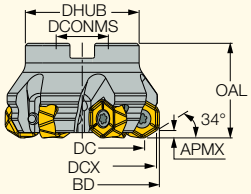
Inserts	Cutting Recommendations for FF Tools ap (mm)	fz (mm/t)	Radius for Programming on FF Tools	Cutting Recommendations for MF Tools ap (mm)	fz (mm/t)	Radius for Programming on MF Tools
H600 WXCU 040310HP	0.5-0.8	0.34-0.68	1.9	0.5-1.5	0.2-0.4	2.6
H600 WXCU 040310T	0.5-0.8	0.68-1.03	1.9	0.5-1.5	0.4-0.6	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

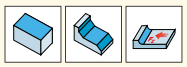
Inserts	Cutting Recommendations for FF Tools in plunging ae (mm)	fz (mm/t)	Radius for Programming on FF Tools	Cutting Recommendations for MF Tools in plunging ae (mm)	fz (mm/t)	Radius for Programming on MF Tools
H600 WXCU 040310HP	3.7	0.04-0.08	1.9	3.5	0.04-0.08	2.6
H600 WXCU 040310T	3.7	0.04-0.10	1.9	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

HELI 12 FEED 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(3)	CSP(4)	MIID(5)	TQ(6)	kg
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 according to D1 diameter 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

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

(4) Master insert identification

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

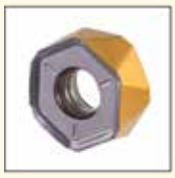
Spare Parts

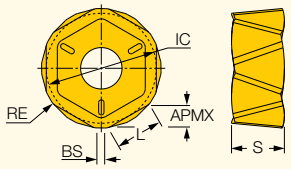
Designation				
MF FHX D063-06-22-R06	SR 14-591/H	BLD T20/S7	SW6-T	SR M10X25 DIN912
MF FHX D080-07-27-R06	SR 14-591/H	BLD T20/S7	SW6-T	SR M12X30DIN912
MF FHX D080-07-32-R06	SR 14-591/H	BLD T20/S7	SW6-T	SR M16X30 DIN912
MF FHX D100-09-32-R06	SR 14-591/H	BLD T20/M7	SW6-T	
MF FHX D125-11-40-R06	SR 14-591/H	BLD T20/M7	SW6-T	
MF FHX D160-13-40-R06	SR 14-591/H	BLD T20/M7	SW6-T	

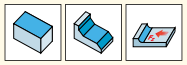
HELI 12 FEED UPFEED LINE

H1200 HXCU 0606

Double-Sided Hexagonal Inserts with 12 Cutting Edges



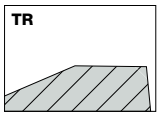


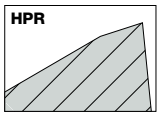


Designation	Dimensions APMX	L	BS	RE	IC	S	Tough ↔ Hard IC845	IC840	IC830	IC5500	IC808	IC810	Recommended Machining Data a_p (mm)	f_z (mm/t)
H1200 HXCU 0606-HPR (1)	3.00	6.43	1.06	1.60	14.88	7.15		●	●				0.20-3.00	0.08-0.40
H1200 HXCU 0606-TR (2)	3.00	6.43	1.06	1.60	14.88	7.15	●		●	●	●	●	0.20-3.00	0.25-0.65

(1) HPR - for stainless steel and high temperature alloys

(2) TR - for steel and cast iron

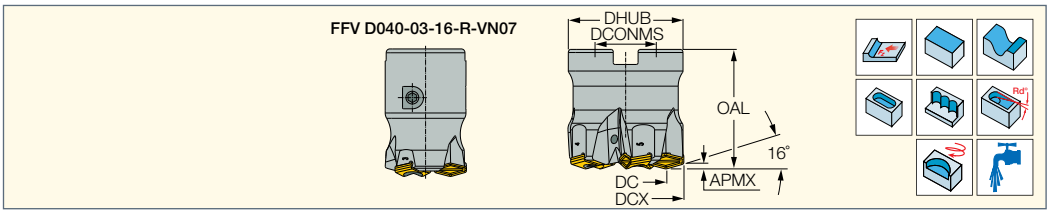




TANG4FEED
HI-FEED MILLING

FFV-D-R-VN07

Fast Feed Shell Mill Carrying Tangentially Clamped Inserts with 4 Cutting Edges



Designation	DCX[2]	DC	APMX	AE[3]	CICT[4]	OAL	DCONMS	DHUB	RMPX°[5]	MDN[6]	MDX[7]	Arbor	MIID[8]	TQ[9]	kg
FFV D040-03-16-R-VN07 [1]	40.00	25.00	1.50	7.5	3	60.00	16.00	25.00	3.0	65.00	79.00	Special	FF VNMT 0706ZN-ER	4.8	0.36
FFV D050-05-22-R-VN07	50.00	35.00	1.50	7.5	5	50.00	22.00	48.00	3.2	85.00	99.00	A	FF VNMT 0706ZN-ER	4.8	0.47
FFV D063-06-22-R-VN07	63.00	48.00	1.50	7.5	6	40.00	22.00	48.00	2.2	111.00	125.00	A	FF VNMT 0706ZN-ER	4.8	0.00
FFV D080-07-27-R-VN07	80.00	65.00	1.50	7.5	7	50.00	27.00	60.00	1.5	145.00	159.00	B	FF VNMT 0706ZN-ER	4.8	0.81
FFV D100-08-32-R-VN07	100.00	85.00	1.50	7.5	8	50.00	32.00	78.00	1.2	185.00	199.00	B	FF VNMT 0706ZN-ER	4.8	1.61

• Radius for programming 2.8 mm • To generate a straight surface without cusps, the width of cut must not exceed DC

(1) Use with the supplied retention screw this screw was designed to be used instead of the standard cutter's frontal screw

(2) Cutting diameter maximum

(3) Maximum plunging width

(4) Number of inserts

(5) Maximum ramping angle

(6) Machinable diameter minimum for interpolation

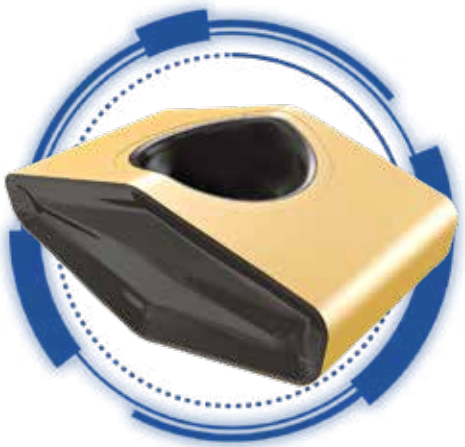
(7) Machinable diameter maximum for interpolation

(8) Master insert identification

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

Spare Parts

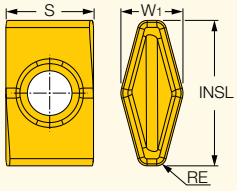
Designation						
FFV D040-03-16-R-VN07	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M8X17-13685		HW 4.0
FFV D050-05-22-R-VN07	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH		SR PS 118-0271C	
FFV D063-06-22-R-VN07	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH	SR M10X25 DIN912		
FFV D080-07-27-R-VN07	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH			
FFV D100-08-32-R-VN07	SR M4X0.7-L11.5 IP15	BLD IP15/S7	SW6-T-SH			

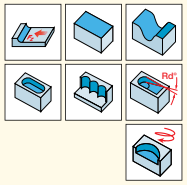


TANG4FEED HI-FEED MILLING

FF VNMT 0706

Tangentially Clamped
Inserts with 4 Cutting Edges
for Fast Feed Milling





Designation	Dimensions W1	INSL	RE	S	Tough ↔ Hard IC882	IC845	IC840	IC830	IC5820	IC5400	IC5500	IC808	IC810	Recommended Machining Data a_p (mm)	f_z (mm/t)
FF VNMT 0706ZN-ER (1)	6.40	15.00	1.00	9.05	•	•	•	•	•	•		•	•	0.50-1.50	0.40-1.80
FF VNMT 0706ZN-ETR (2)	6.40	15.00	1.00	9.05				•			•	•	•	0.50-1.50	0.40-1.80

• For side plunging, the initial cutting feed is 0.1 mm/t
(1) For general applications
(2) Reinforced cutting edges for interrupted cuts and unfavorable conditions

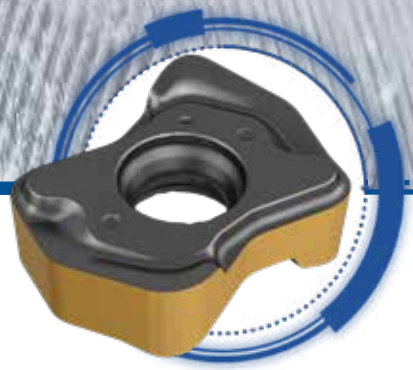
Average Cutting Data for FFV Size 07 Fast Feed Cutters

Workpiece material												
ISO class DIN/ ISO 513	Description	ISCAR mat. group*	Hardness HB	Typical material AISI/SAE/ ASTM	Typical material DIN W.-Nr.	Insert type	Carbide grade	D.O.C. a_p (mm)	Cutting speed v_c (m/min)	Feed f_z (mm/tooth)	Coolant
P	Non-alloy steel	1-5	130-180	1020	1.0402	ER / ETR	IC808	0.5-1.5	150-220	0.50-1.30	Dry
							IC830		140-200	0.60-1.60	Dry/Wet
							IC845		130-180	0.70-1.80	Dry/Wet
							IC5400		150-250	0.50-1.10	Dry
	Low alloy steel	6-8	260-300	4340	1.6582		IC808		140-200	0.50-1.20	Dry
							IC830		120-180	0.50-1.50	Dry/Wet
							IC845		100-160	0.60-1.60	Dry/Wet
							IC5400		140-220	0.50-1.30	Dry
		9	HRC 35-42**	3135	1.5710		IC808		130-180	0.50-1.20	Dry
							IC830		120-160	0.50-1.40	Dry/Wet
							IC845		100-150	0.50-1.50	Dry/Wet
							IC5400		130-190	0.50-1.10	Dry
	High alloy steel	10-11	200-220	H13	1.2344		IC808		120-170	0.50-1.20	Dry
							IC830		100-150	0.50-1.30	Dry/Wet
							IC845		90-140	0.50-1.40	Dry/Wet
							IC5400		120-180	0.50-1.10	Dry
	Ferritic/martensitic stainless steel	12-13	200	420	1.4021		IC808		110-160	0.50-1.20	Dry
							IC830		100-150	0.50-1.30	Dry/Wet
							IC845		100-140	0.50-1.40	Dry/Wet
							IC5400		110-160	0.50-1.10	Dry
M	Austenitic stainless steel	14	200	304L	1.4306	ER	IC840	0.5-1.5	80-140	0.40-0.60	Wet
							IC830		80-120	0.40-0.70	
							IC882		80-130	0.40-0.90	
							IC5820		100-160	0.40-0.80	
							IC808		100-160	0.40-0.70	
K	Gray cast iron	15-16	250	Class 40 Class	0.6025 (GG25)	ER / ETR	IC810	0.5-1.5	150-220	0.50-1.80	Dry
	Nodular cast iron	17-18	200	65-45-12	0.7050 (GGG50)		IC810		120-200	0.50-1.80	
S	High temperature alloys and Titanium	33-35	340	Inconel 718	2.4668	ER	IC808	0.5-1.5	25-40	0.40-0.60	Wet
							IC840		25-35	0.40-0.50	
							IC882		20-30	0.50-0.80	
							IC5820		25-35	0.50-0.70	
							IC830		20-30	0.40-0.60	
		36-37	HRC30-32	AMS R56400	3.7165 (Ti6Al4V ELI)		IC808		30-60	0.40-0.70	
							IC840		25-35	0.40-0.60	
							IC882		25-35	0.40-0.90	
							IC5820		20-30	0.40-0.80	
							IC830		20-30	0.40-0.70	
H	Hardened steel	38.1	HRC 45-49	HARDOX 450 plate		ETR	IC808	0.5-1.5	75-90	0.40-0.80	Dry

* ISCAR material group in accordance with VDI 3323 standard
** Quenched and tempered
For machining under unstable conditions, the recommended cutting data should be reduced by 20-30%

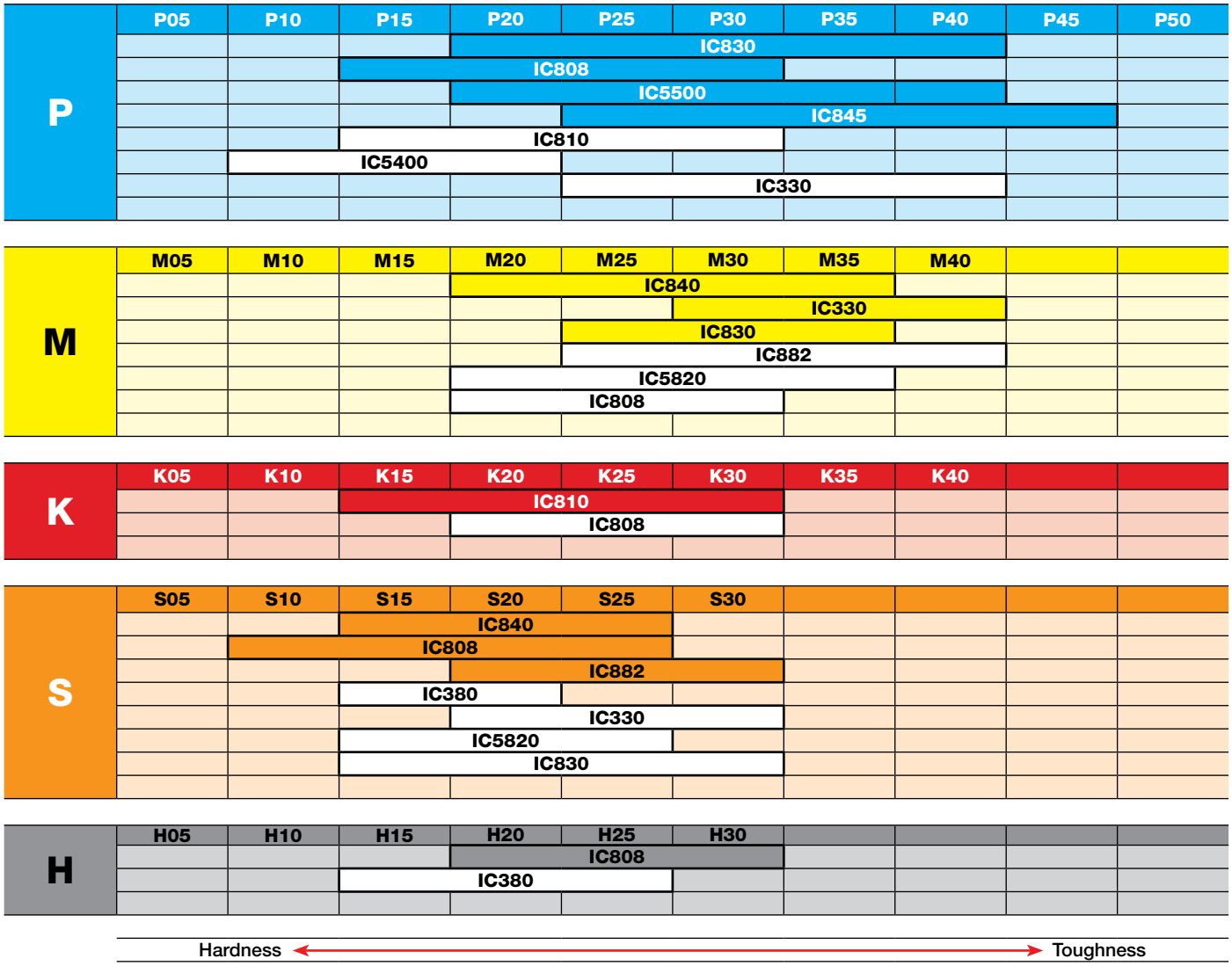
LOGIQ4FEED

HIGH FEED MILLING



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

Application Range of Carbide Grades for Indexable Lines



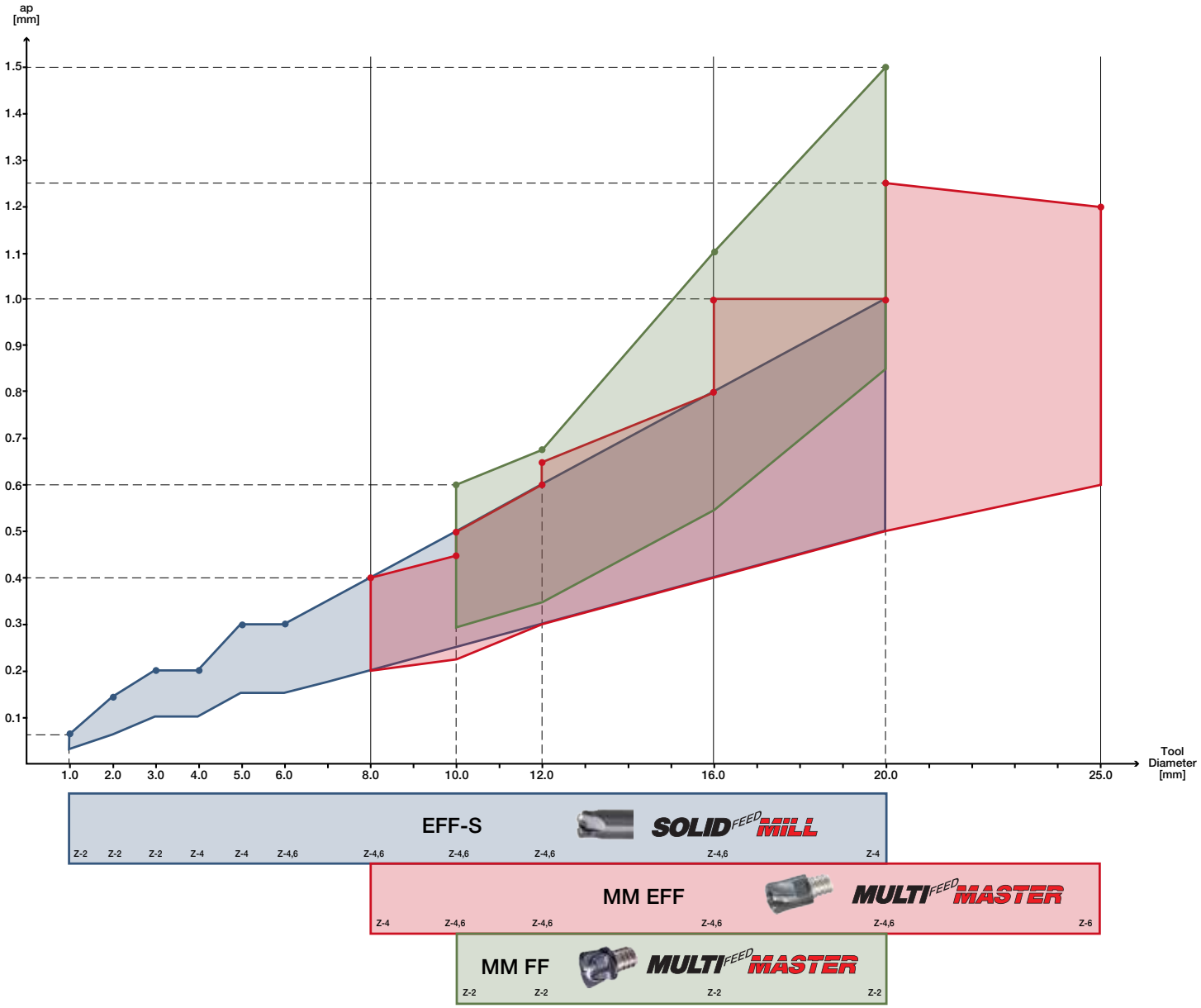
ICXX The marked area features the most suitable grade
ICXX The white area relates to a complementary grade

Recommended Cutting Speed Range for Indexable Fast Feed Milling Cutters

ISO	Material		Condition	Material No.	Cutting Speed (m/min) for 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	140-200			**130-220**		150-200		150-250	**150-210**	**150-220**	150-220
		>= 0.25 %C	Annealed	2	130-190			**120-200**		140-190		140-240	**140-210**	**150-220**	140-220
		< 0.55 %C	Quenched and tempered	3	130-190			**120-190**		140-190		140-230	**140-200**	**150-210**	140-210
		>= 0.55 %C	Annealed	4	120-180			**120-180**		130-180		140-220	**130-200**	**140-210**	130-210
		>= 0.55%C	Quenched and tempered	5	120-170			**110-180**		130-170		140-220	**130-190**	**140-210**	130-210
	Low alloy steel and cast steel (less than 5% all elements)		Annealed	6	120-160			**110-170**		120-160		140-210	**130-180**	**140-200**	130-200
			Quenched and tempered	7	110-150			**100-160**		120-140		130-200	**120-170**	**130-190**	120-190
				8	100-140			**100-150**		110-140		130-190	**110-160**	**130-180**	120-180
				9	90-150			**90-150**		100-130		130-180	**110-160**	**130-180**	120-180
	High alloy steel, cast steel and tool steel		Annealed	10	80-130			**80-140**		90-120		120-180	**110-150**	**120-170**	120-170
			Quenched and tempered	11	80-120			**80-130**		90-110		120-170	**100-140**	**120-160**	110-160
	Stainless steel and cast steel		Ferritic/martensitic	12	100-140			**110-160**		90-160		120-170	**90-160**	**110-170**	110-170
			Martensitic	13	90-130			**100-150**		80-150		110-160	**80-150**	**100-160**	100-150
M	Stainless steel and cast steel		Austenitic	14	**80-120**		70-140		**80-150**	**80-140**	100-160			100-160	
K	Gray cast iron		Ferritic/pearlitic	15										140-200	**150-220**
			Pearlitic/martensitic	16										130-190	**140-210**
	Ductile cast iron (nodular)		Ferritic	17										110-180	**120-200**
			Pearlitic	18										100-170	**110-180**
	Malleable cast iron		Ferritic	19										140-190	**140-210**
			Pearlitic	20										110-170	**110-200**
S	High temp. alloys	Fe based	Annealed	31	35-50	40-50	**35-50**		**30-45**	25-50	40-50			**40-50**	
			Hardened	32	30-40	35-45	**30-40**		**20-35**	20-40	30-40			**30-40**	
		Ni or Co bases	Annealed	33	25-35	30-45	**25-35**		**20-30**	20-40	30-40			**25-40**	
			Hardened	34	20-25	25-35	**20-25**		**20-25**	20-35	25-35			**25-35**	
			Cast	35	25-30	30-35	**25-30**		**25-30**	20-40	30-35			**30-40**	
	Titanium and Ti alloys		Pure Titanium	36	40-70	50-80	**45-70**		**40-60**	25-50	40-80			**45-90**	
			Alpha+beta alloys cured	37	30-60	30-60	**30-55**		**20-50**	30-45	25-60			**25-60**	
H	Hardened steel		Hardened	38		45-55								**45-65**	
			Hardened	39		40-50								**40-60**	
	Chilled cast iron		Cast	40		70-90								**70-85**	
	Cast iron		Hardened	41		45-55								**45-65**	

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

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

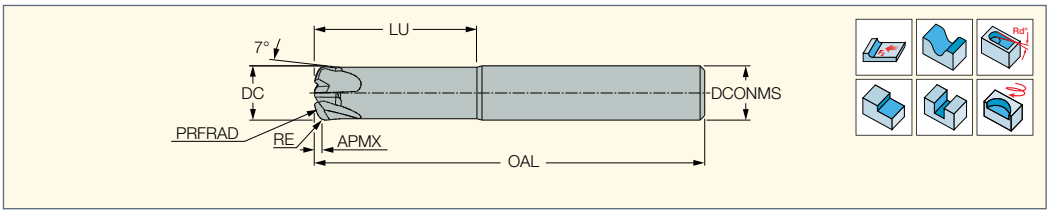
MULTI FEED MASTER

Interchangeable 2 flute
FEEDMILL solid carbide heads

SOLID FEED MILL

EFF-S2/S4/S6

Solid Carbide Endmills with Relieved Necks for Fast Feed High Productivity



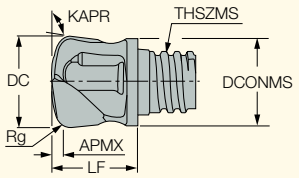
Designation	Dimensions									Tough ↔ Hard		Recommended Machining Data
	DC	DCONMS	OAL	NOF(1)	LU	RE(2)	PRFRAD	APMX	Shank(3)	IC903	IC902	f_z (mm/t)
EFF-S2 01-04/03C6RP.15M50	1.00	6.00	50.00	2	3.0	0.15	0.1	0.40	C		•	0.02-0.05
EFF-S2 02-07/06C6RP0.3M50	2.00	6.00	50.00	2	6.0	0.30	0.2	0.70	C		•	0.10-0.14
EFF-S2 03-1/09C06RP0.5M50	3.00	6.00	50.00	2	9.0	0.50	0.4	1.00	C		•	0.10-0.20
EFF-S4-04 020/14C06M57	4.00	6.00	57.00	4	14.0	0.70	0.5	2.00	C		•	0.10-0.25
EFF-S4-05 022/17C06M57	5.00	6.00	57.00	4	17.0	0.90	0.6	2.20	C		•	0.10-0.30
EFF-S4-06 030/20C06R1.0M	6.00	6.00	57.00	4	20.0	1.23	5.3	3.00	C	•		0.10-0.30
EFF-S6-06 025/20C06R0.7M	6.00	6.00	57.00	6	20.0	0.40	5.0	2.80	C		•	0.10-0.25
EFF-S4-08 035/26C08R1.3M	8.00	8.00	63.00	4	26.0	1.62	7.0	3.50	C	•		0.10-0.40
EFF-S6-08 025/26C08R0.86M	8.00	8.00	63.00	6	26.0	0.86	6.0	2.90	C		•	0.10-0.35
EFF-S4-10 040/30C10R1.6M	10.00	10.00	72.00	4	30.0	2.01	8.8	4.00	C	•		0.15-0.50
EFF-S6-10 025/30C10R1.0M	10.00	10.00	72.00	6	30.0	1.00	6.0	2.80	C		•	0.15-0.45
EFF-S4-12 045/34C12R2.0M	12.00	12.00	83.00	4	34.0	2.47	10.6	4.50	C	•		0.15-0.50
EFF-S6-12 030/34C12R1.2M	12.00	12.00	83.00	6	34.0	1.20	10.0	3.30	C		•	0.15-0.45
EFF-S4-16 055/42C16R2.6M	16.00	16.00	92.00	4	42.0	3.25	14.0	5.50	C	•		0.20-0.60
EFF-S6-16 045/42C16R2.0M	16.00	16.00	92.00	6	42.0	2.00	16.0	4.50	C		•	0.20-0.55
EFF-S4-20 060/46C20R3.2M	20.00	20.00	104.00	4	46.0	4.02	17.7	6.00	C	•		0.20-0.70

(1) Number of flutes
(2) To be used for programming
(3) C-Cylindrical

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.



Economical solution

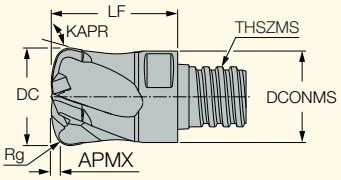
Designation	Dimensions									Tough ↔ Hard		Recommended Machining Data
	DC	NOF(1)	APMX	Rg(2)	THSZMS	DCONMS	LF	KAPR	RMPX(3)	IC908	IC903	f_z (mm/t)
MM FF100R1.5-L12-2T06	10.00	2	0.60	2.00	T06	9.60	12.50	97.0	7.0	•		0.30-0.60
MM FF120R2.0-2T08	12.00	2	0.68	2.50	T08	11.50	11.10	97.0	7.0	•	•	0.50-1.00
MM FF500R08-L59-2T08	12.70	2	0.68	2.50	T08	11.50	15.00	95.0	7.0	•		0.50-1.00
MM FF160R2.0-2T10	16.00	2	1.10	3.00	T10	15.20	13.50	97.0	7.0	•		0.55-1.10
MM FF200R2.0-2T12	20.00	2	1.50	3.40	T12	18.45	17.40	95.0	7.0	•		0.75-1.50

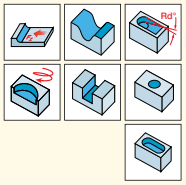
• Do not apply lubricant to the threaded connection.
(1) Number of flutes
(2) Radius for programming
(3) Maximum ramping angle

MULTI FEED MASTER

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[3]	APMX	THSZMS	DCONMS	LF	RMPX°[4]	KAPR[5]	Rg[6]	CSP[7]	IC908	IC903	f_z (mm/t)
MM EFF080T3R1.62-4T05	8.00	4	0.40	T05	7.50	10.00	5.0	97.0	1.62	0		•	0.12-0.48
MM EFF100T4R2.01-4T06	10.00	4	0.50	T06	9.50	13.00	5.0	97.0	2.01	0		•	0.16-0.57
MM EFF100T2R1.0-6T06H [1]	10.00	6	0.45	T06	9.50	10.00	3.0	97.0	1.00	1		•	0.16-0.47
MM EFF120T4R1.8-4T08H [1]	12.00	4	0.60	T08	11.50	16.50	5.0	97.0	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	2.47	0		•	0.16-0.67
MM EFF120T2R1.2-6T08H [1]	12.00	6	0.65	T08	11.50	12.50	3.0	97.0	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	2.59	0		•	0.16-0.67
MM EFF127T4R1.3-6T08H	12.70	6	0.70	T08	12.20	12.70	3.0	97.0	1.30	1		•	0.16-0.67
MM EFF160T5R2.2-4T10H [1]	16.00	4	0.80	T10	15.40	20.50	5.0	97.0	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	3.25	0		•	0.20-0.75
MM EFF160T4R2.0-6T10H [1]	16.00	6	1.05	T10	15.40	16.00	3.0	97.0	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	4.02	0		•	0.20-0.90
MM EFF200T5R2.2-6T12H [1]	20.00	6	1.25	T12	18.45	20.00	3.0	97.0	2.20	1		•	0.20-0.80
MM EFF250A7R3.1-6T15 [2]	25.00	6	1.20	T15	23.90	25.00	5.0	97.0	3.10	0		•	0.25-1.00
MM EFF254A7R3.1-6T15 [2]	25.40	6	1.20	T15	23.90	25.00	5.0	97.0	3.10	0		•	0.25-1.00

- Do not apply lubricant to the threaded connection.

[1] With a central coolant hole
[2] Cannot be used for plunging application
[3] Number of flutes
[4] Maximum ramping angle
[5] Tool cutting edge angle
[6] Radius for programming
[7] 0 - Without coolant supply, 1 - With coolant supply

Multi Master Machining Recommendations

VDI 3323	Material Group[1]	v_c (m/min)	a_p	a_e	f_z (mm/t) vs. Tool Diameter (mm)					
					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	apmax	0.7xD	0.45	0.52	0.60	0.70	0.80	0.90
	17-18	160	apmax	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 in accordance with VDI 3323 standard
[2] 45-49 HRC
[3] 50-55 HRC
[4] 56-63 HRC

a_p - maximum depth of cut
a_e - maximum 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

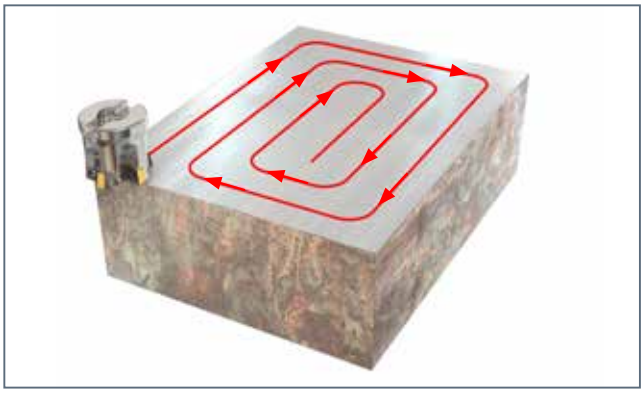
Recommended Cutting Speed Range for Fast Feed Solid Carbide Endmills and Multi-Master Heads

ISO	Material		Condition	Material No.	Cutting Speed (m/min) for Grade		
					IC902	IC903	IC908
P	Non alloy steel and cast steel (less than 5% all elements)	< 0.25 %C	Annealed	1	250-300	250-270	260-280
		>= 0.25 %C	Annealed	2	200-250	200-230	200-230
		< 0.55 %C	Quenched and tempered	3	160-240	160-220	160-220
		>= 0.55 %C	Annealed	4	160-240	160-220	160-220
		>= 0.55%C	Quenched and tempered	5	140-200	140-180	140-180
	Low alloy steel and cast steel (less than 5% all elements)		Annealed	6	160-240	160-220	160-220
			Quenched and tempered	7	120-200	120-180	120-18
				8	130-200	130-200	130-180
				9	140-200	130-180	140-180
	High alloy steel, cast steel and tool steel		Annealed	10	130-200	130-180	130-180
			Quenched and tempered	11	70-130	70-120	70-120
	Stainless steel and cast steel		Ferritic/martensitic	12	80-175	80-160	80-160
			Martensitic	13	60-165	60-150	60-150
M	Stainless steel and cast steel		Austenitic	14	60-130	60-120	60-120
K	Gray cast iron		Ferritic/pearlitic	15	80-275	80-250	80-260
			Pearlitic/martensitic	16	130-265	130-240	130-240
	Ductile cast iron (nodular)		Ferritic	17	150-300	150-270	150-280
			Pearlitic	18	90-300	90-270	90-280
	Malleable cast iron		Ferritic	19	150-300	150-270	150-280
			Pearlitic	20	140-265	140-240	140-240
S	High temp. alloys	Fe based	Annealed	31	20-45	20-40	20-40
			Hardened	32	20-35	20-30	20-40
		Ni or Co bases	Annealed	33	20-35	20-30	20-30
			Hardened	34	20-35	20-30	20-30
			Cast	35	30-90	30-80	30-70
	Titanium and Ti alloys		Pure Titanium	36	30-90	30-80	30-70
			Alpha+beta alloys cured	37	30-90	30-80	30-70
H	Hardened steel		Hardened	38	30-65	30-60	30-50
			Hardened	39	30-45	30-40	30-40
	Chilled cast iron		Cast	40	70-100	70-90	60-80
	Cast iron		Hardened	41	30-65	30-60	30-50

Recommendations for Machining Methods

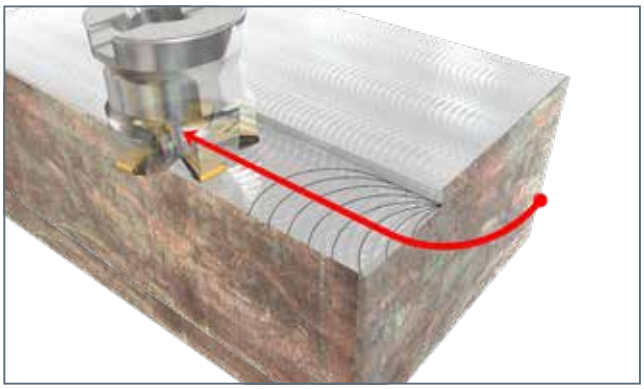
Face Milling
Including Milling Next to Square Shoulder

- 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 additonal passes after stepdown
- Down (climb) milling is preferable



Cutting into material

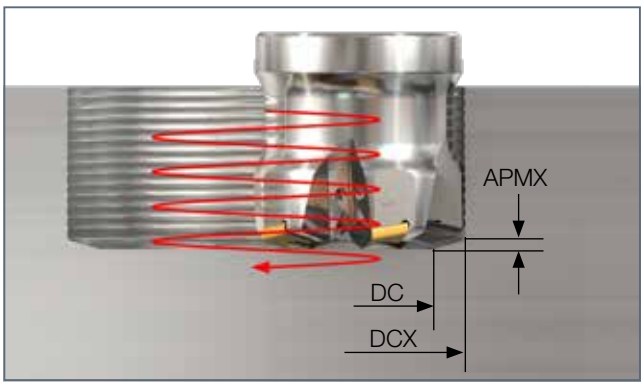
In milling, an approach cut by arc ("rolling in") is preferable. When a milling cutter enters a machined material by arc, the chip thickness (and therefore, loading the cutting edge) grows to a maximum value progressively and then gradually diminishes to zero. It significantly contributes to machining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



Milling Hole of Diameter D
by Helical Interpolation

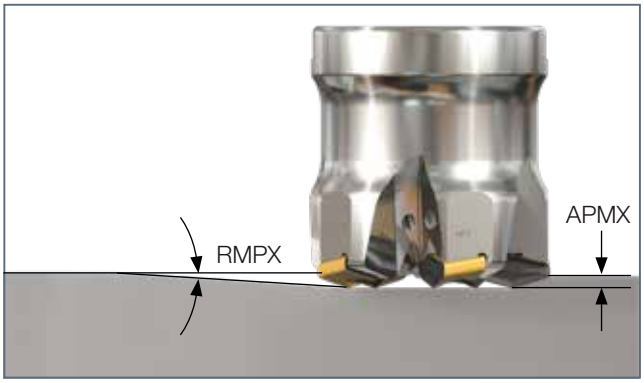
Maximum and minimum hole diameters
Dmax and Dmin correspondingly:
Dmax = 2 x DCX – 1, Dmin = DCX + DC

- 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 fz by 30-40%



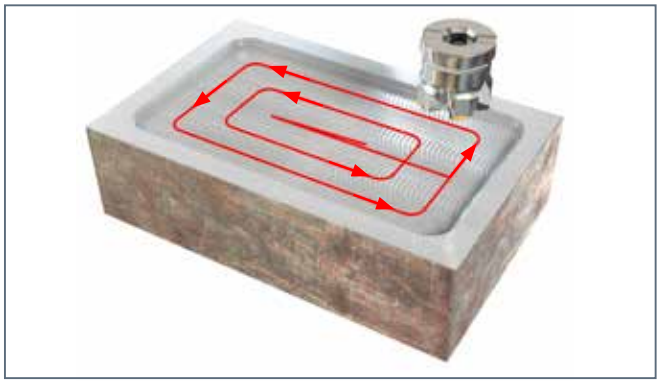
Milling by Ramping Down

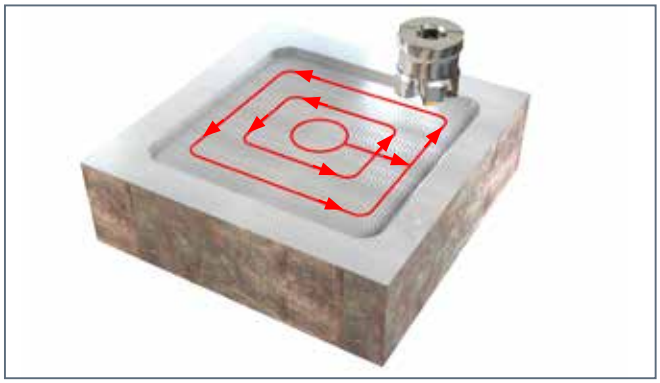
- Depth of ramping per pass should not exceed maximum depth of cut APMX
- Ramping angle should not exceed maximum ramping angle RMPX
- Down (climb) milling is preferable
- It is recommended to reduce feed per tooth fz by 30-40%



Pocket Milling

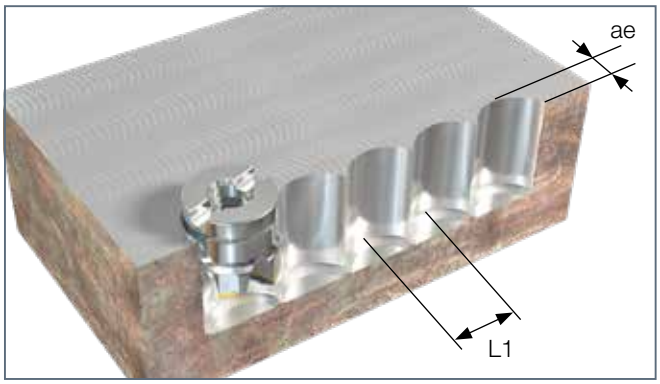
- In pocket milling, machining from the center to outside contour is preferable
- In ramping down by line or helix, depth of ramping per pass should not exceed the maximum depth of cut APMX and the ramping angle should not exceed the maximum ramping angle RMPX
- In ramping down passes, it is recommended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

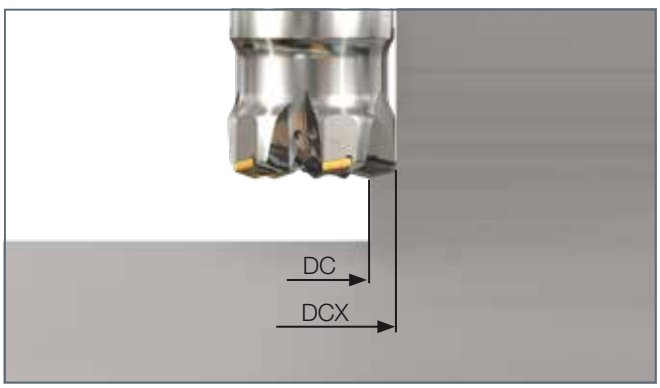




Side Plunge Milling

- The relationship between L1 max 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

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