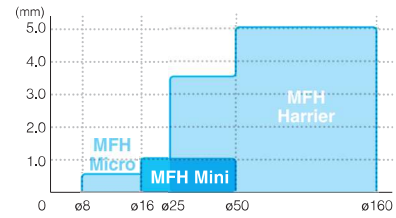


MFH Mini

Cutter Dia. : $\phi 16 \sim \phi 50$

NEW GH Chipbreaker
Now Available



- Economical Double-sided 4-edge Insert
- High efficiency and high feed machining at small dia. machining and small machining center

POINT.1 Excellent chip evacuation

(Internal evaluation)

MFH Mini
Good chip evacuation
Chips are easily cut off

High quality surface finish

Conventional high feed cutter
Poor chip evacuation
Chips clings to the insert

Chip biting in the workpiece

MFH Mini controls chip biting with 3D convex cutting edge

Cutting Conditions : Workpiece Material SS400 Cutter Dia. $\phi 16$ $V_c=150\text{m/min}$ $a_{pxae}=10\text{mm}(0.5\text{mm} \times 20 \text{ passes}) \times 16\text{mm}$ $f_z=0.6\text{mm/t}$ Dry

POINT.2 Multi edge design enables high efficiency machining

· Cutter Dia. $\phi 25$

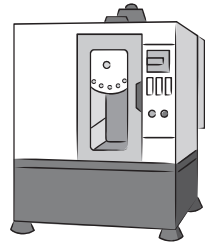
MFH Mini

5 flutes
MFH25-S25-03-5T

MFH Harrier

2 flutes
MFH25-S25-10-2T

POINT.3 High efficiency and high feed machining at small machining center (BT30/BT40)

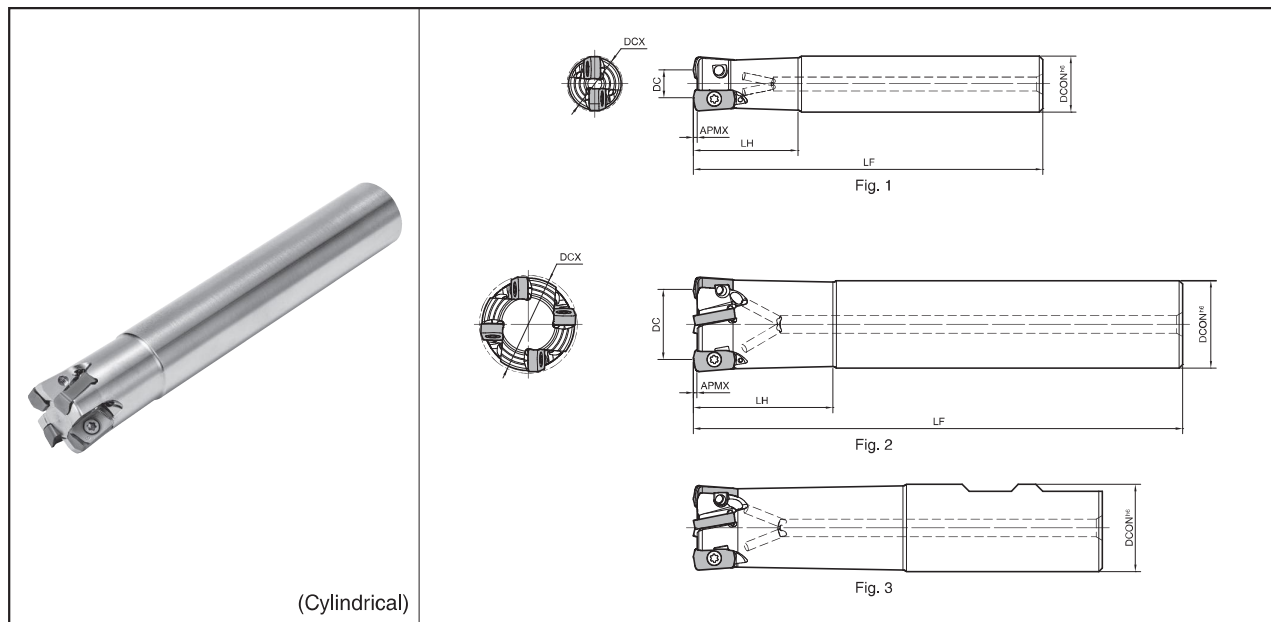


Suitable for roughing of mold

Insert Grades	A
Turning Indexable Inserts	B
CN & PCD Tools	C
External	D
Small Parts Machining	E
Boring	F
Grooving	G
Cut-off	H
Threading	J
Drilling	K
Milling	M
Tools for Turning Mill	N
Spare Parts	P
Technical Information	R
Index	T

MFH High Feed Cutter

MFH Mini End Mill



Toolholder Dimensions

Description	Stock	No. of Inserts	Dimension (mm)							Rake Angle	Coolant Hole	Drawing	Weight (kg)	Max. Revolution (min ⁻¹)			
			DCX	DC	DCON	LF	LH	APMX	A.R.								
Standard Shank	MFH 16-S16-03-2T	●	2	16	8	16	100	30	1	-10°	Yes	Fig. 1	0.1	18,800			
	20-S20-03-3T	●	3	20	12	20	130	50					0.3	15,700			
	20-S20-03-4T	●	4	25	17	25	140	60					0.5	13,400			
	25-S25-03-5T	●	5	32	24	32	150	70					0.8	11,400			
	32-S32-03-5T	●	6	17	9	16	100	20					0.1	17,900			
	32-S32-03-6T	●	6	18	10	16	100	20					0.1	17,000			
Over Size (Straight)	MFH 17-S16-03-2T	●	2	17	9	16	100	20				1	-10°	Yes	Fig. 2	0.1	17,900
	18-S16-03-2T	●	2	18	10	16	100	20								0.1	17,000
	22-S20-03-3T	●	3	22	14	20	130	30								0.3	14,700
	22-S20-03-4T	●	4	28	20	25	140	40								0.5	12,400
	28-S25-03-4T	●	4	28	20	25	140	40								0.5	12,400
Weldon	MFH 16-W16-03-2T	●	2	16	8	16	79	30				1	-10°	Yes	Fig. 3	0.1	18,800
	20-W20-03-3T	●	3	20	12	20	101	50								0.2	15,700
	20-W20-03-4T	●	4	25	17	25	117	60								0.4	13,400
	25-W25-03-4T	●	4	25	17	25	117	60								0.4	13,400
	25-W25-03-5T	●	5	32	24	32	131	70								0.7	11,400
	32-W32-03-5T	●	5	32	24	32	131	70								0.7	11,400
Long Shank	MFH 16-S16-03-2T-150	●	2	16	8	16	150	50				1	-10°	Yes	Fig. 1	0.2	18,800
	20-S20-03-3T-160	●	3	20	12	20	160	80	0.3	15,700							
	25-S25-03-4T-180	●	4	25	17	25	180	100	0.6	13,400							
	32-S32-03-5T-200	●	5	32	24	32	200	120	1.1	11,400							

Coat Anti-seize Compound thinly on portion of taper and thread when insert is fixed.

Recommended Cutting Conditions **M160**

Max. Revolution

Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare Parts

Description	Spare Parts		
	Clamp Screw	Wrench	Anti-seize Compound
MFH ...-03-...	SB-3065TRP	DTPM-8	P-37
Recommended tightening torque for Insert Clamp 1.2N·m			

● : Std. Item

M

Milling

Insert

Lead Angle

45°-20°

Lead Angle

15°

Lead Angle

0°/2°

High Feed

Cutter

Cutter for

Finishing

Multi-

Function

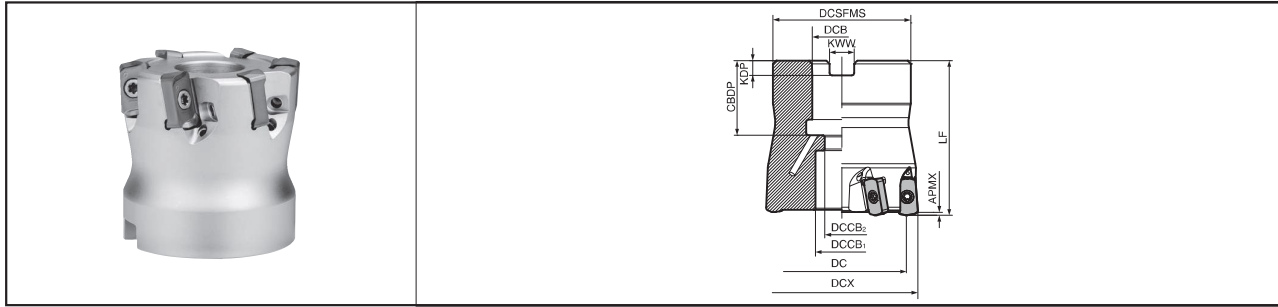
Slot Mill

Ball-nose

Radius

Others

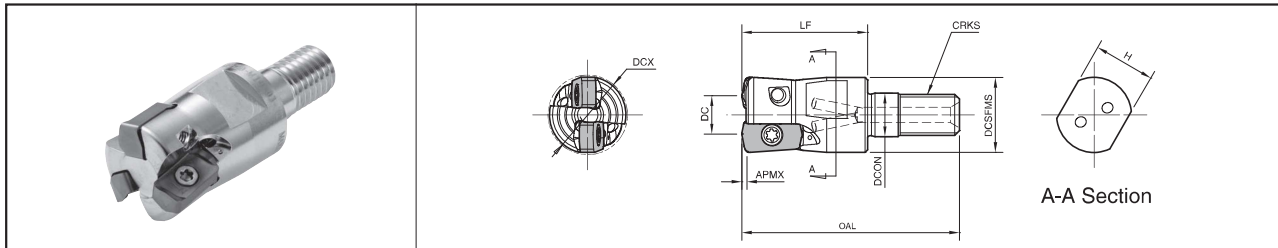
MFH Mini Face Mill



Toolholder Dimensions

Bore Dia.	Description	Stock	No. of Inserts	Dimension (mm)										Rake Angle	Coolant Hole	Weight (kg)	Max. Revolution (min ⁻¹)	
				DCX	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX				A.R.
Metric	MFH 040R-03-5T-M	●	5	40	32	38	16	15	9	40	19	5.6	8.4	1	-10°	Yes	0.2	9,900
	040R-03-6T-M	●	6	40	32	38	16	15	9	40	19	5.6	8.4					
	050R-03-8T-M	●	8	50	42	47	22	19	11	50	21	6.3	10.4					

MFH Mini Head



Toolholder Dimensions

Description	Stock	No. of Inserts	Dimension (mm)								Rake Angle	Coolant Hole	Max. Revolution (min ⁻¹)	
			DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX			A.R.
MFH 16-M08-03-2T	●	2	16	8	14.7	8.5	42	25	M8xP1.25	12	1	-10°	Yes	18,880
17-M08-03-2T	●		17	9										17,900
18-M08-03-2T	●		18	10										17,000
MFH 20-M10-03-3T	●	3	20	12	18.7	10.5	48	30	M10xP1.5	15	1	-10°	Yes	15,700
20-M10-03-4T	●													4
22-M10-03-3T	●	3	22	14	18.7	10.5	48	30	M10xP1.5	15	1	-10°	Yes	14,700
22-M10-03-4T	●													4
MFH 25-M12-03-4T	●	4	25	17	23	12.5	56	35	M12xP1.75	19	1	-10°	Yes	13,400
25-M12-03-5T	●													5
28-M12-03-4T	●	4	28	20	23	12.5	56	35	M12xP1.75	19	1	-10°	Yes	12,400
28-M12-03-5T	●													5
MFH 32-M16-03-5T	●	5	32	24	30	17	62	40	M16xP2.0	24	1	-10°	Yes	11,400
32-M16-03-6T	●													6

Coat Anti-seize Compound thinly on portion of taper and thread when insert is fixed.

Recommended Cutting Conditions **M160**

Max. Revolution

Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

See page **M60** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Applicable Inserts **M15**

Insert	Description	Dimension (mm)					MEGACOAT NANO			MEGACOAT HARD	CVD Coated Carbide
		W1	S	D1	INSL	RE	PR1535	PR1525	PR1510	PR015S	CA6535
General purpose	LOGU 030310ER-GM	6.2	3.96	3.45	11.9	1.0	●	●	●		●
NEW Tough Edge	LOGU 030310ER-GH	6.2	3.96	3.45	11.9	1.0	●	●	●	●	

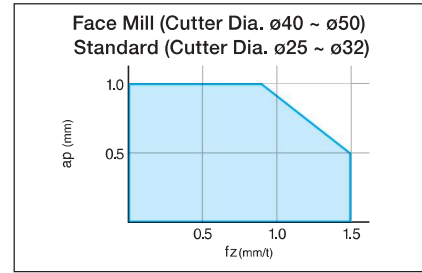
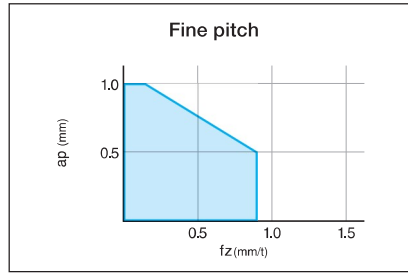
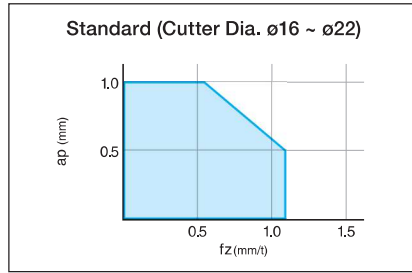
● : Std. Item

Insert Grades
Turning
Indexable Inserts
CNC & PCD Tools
External
Small Parts
Machining
Boring
Grooving
Cut-off
Threading
Drilling
Milling
Tools for
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MFH High Feed Cutter

Cutting Performance



MFH16-...-2T, MFH17-...-2T, MFH18-...-2T
MFH20-...-3T, MFH22-...-3T

MFH20-...-4T, MFH22-...-4T, MFH25-...-5T
MFH28-...-5T, MFH32-...-6T

MFH25-...-4T, MFH28-...-4T, MFH32-...-5T
MFH040R-..., MFH050R-...

When using fine pitch type, reduce the cutting conditions compared with standard type.

Recommended Cutting Conditions

Insert Type	Workpiece Material	Toolholder Description and Feed Rate (fz : mm/t) * Recommended feed rate (Reference value) : ap=0.5mm								Recommended Insert Grades (Cutting Speed Vc: m/min)				
		MFH16 -...-2T	MFH20 -...-3T	MFH20 -...-4T	MFH25 -...-4T	MFH25 -...-5T	MFH32 -...-5T	MFH32 -...-6T	MFH -...-R-03	MEGACOAT NANO			MEGACOAT HARD	CVD Coated Carbide
										PR1535	PR1525	PR1510	PR015S	CA6535
GM GH	Carbon Steel	0.2-0.7-1.2		0.2-0.5-0.8	0.2-0.8-1.5	0.2-0.5-0.8	0.2-0.8-1.5	0.2-0.5-0.8	0.2-0.8-1.5	☆ 120-180-250	★ 120-180-250	-	-	-
	Alloy Steel									☆ 100-160-220	★ 100-160-220	-	-	-
	Mold Steel (~40HRC)	0.2-0.5-0.9		0.2-0.4-0.6	0.2-0.6-1.2	0.2-0.4-0.6	0.2-0.6-1.2	0.2-0.4-0.6	0.2-0.6-1.2	☆ 80-140-180	☆ 80-140-180	-	GH★ 80-140-180	-
	Mold Steel (40-50HRC)	0.2-0.3-0.5		0.2-0.25-0.3	0.2-0.3-0.6	0.2-0.25-0.3	0.2-0.3-0.6	0.2-0.25-0.3	0.2-0.3-0.6	-	☆ 60-100-130	-	GH★ 60-100-130	-
	Mold Steel (50-55HRC)	0.1-0.3-0.5		0.1-0.2-0.3	0.1-0.3-0.5	0.1-0.2-0.3	0.1-0.3-0.5	0.1-0.2-0.3	0.1-0.3-0.5	-	☆ 50-70-100	-	GH★ 50-70-100	-
	Mold Steel (55-60HRC)	0.03-0.06-0.1(* Recommended only for GH chipbreaker)								-	-	-	GH☆ 50-60-70	-
	Stainless Steel (Austenitic related)									GM★ 100-160-200	GM☆ 100-160-200	-	-	-
	Stainless Steel (Martensitic related)	0.2-0.5-0.9		0.2-0.4-0.6	0.2-0.6-1.2	0.2-0.4-0.6	0.2-0.6-1.2	0.2-0.4-0.6	0.2-0.6-1.2	☆ 150-200-250	-	-	-	★ 180-240-300
	Stainless Steel (Precipitation Hardening)									★ 90-120-150	-	-	-	-
	Gray Cast Iron	0.2-0.7-1.2		0.2-0.5-0.8	0.2-0.8-1.5	0.2-0.5-0.8	0.2-0.8-1.5	0.2-0.5-0.8	0.2-0.8-1.5	-	-	★ 120-180-250	-	-
Nodular Cast Iron	0.2-0.5-0.9		0.2-0.4-0.6	0.2-0.6-1.2	0.2-0.4-0.6	0.2-0.6-1.2	0.2-0.4-0.6	0.2-0.6-1.2	-	-	★ 100-150-200	-	-	
Ni-base heat-resistant alloys									☆ 20-30-50	-	-	-	★ 20-30-50	
Titanium Alloys	0.2-0.3-0.6		0.2-0.25-0.4	0.2-0.4-0.8	0.2-0.25-0.4	0.2-0.4-0.8	0.2-0.25-0.4	0.2-0.4-0.8	GM★ 40-60-80	-	GM☆ 30-50-70	-	-	

Standard Fine pitch ★ : 1st Recommendation ☆ : 2nd Recommendation

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.

For slotting, internal coolant or center through coolant is recommended.

Slotting and pocketing are not recommended for face mill type.

Note for Machining Program (Approx. R)

Shape	Approx. R (mm)	Max. over machining of radius (mm)	Max. unmachined portion (mm)
	R1.0	0	0.51
	R1.5	0	0.41
	R1.6 (Recommended)	0	0.39
	R2.0	0.09	0.31

Cutting Edge Angle : 12°

M

Milling

Insert

Lead Angle

45°-20°

Lead Angle

15°

Lead Angle

0°/2°

High Feed

Cutter

Cutter for

Finishing

Multi-

Function

Slot Mill

Ball-nose

Radius

Others

Reference data for Ramping

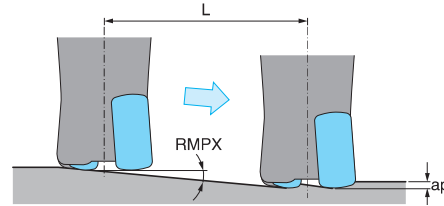
Description	Cutter Dia, DCX (mm)	16	17	18	20	22	25	28	32	40	50
MFH ...-03-...	Max. ramping angle RMPX	2.8°	2.5°	2.1°	1.7°	1.4°	1.2°	1°	0.8°	0.5°	0.4°
	tan RMPX	0.049	0.042	0.037	0.03	0.024	0.021	0.017	0.014	0.009	0.007

Guide for Ramping (Slant Milling)

- Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
- Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at Max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$

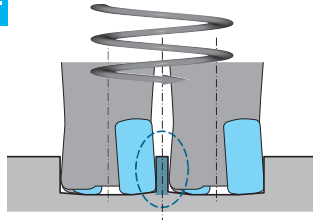


Guide for Helical milling

- For helical milling, use between Min. cutting dia. and Max. cutting dia.

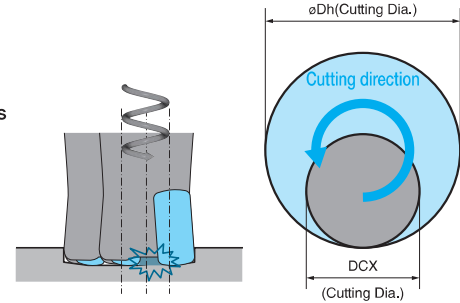
Over Max. Cutting Dia.

Center core part remains after machining



Under Min. Cutting Dia.

Center core part interferes with toolholder

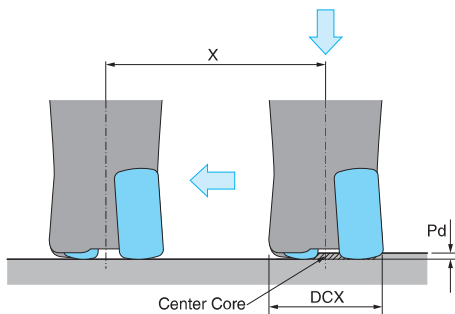


Description	Min. Cutting Dia.	Max. Cutting Dia.
MFH...-03-...	2×DCX-8	2×DCX-2

Unit : mm

- Sinking depth at helical milling should be Max. ap (1mm) or under.
- Down-cut milling is recommended. (refer to the figure above)
- Feed rate should be under 50% of the recommended cutting conditions.
- Be careful to machine in a safe environment to avoid accident caused by long chips.

Guide for Drilling



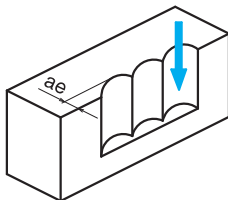
Description	GM type / GH type	
	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MFH...-03-...	1.0	DCX-9

Unit : mm

- * When traversing directly after drilling, set the table feed at up to 25% of the recommended cutting conditions.
- * When drilling, reduce feed rate per revolution to f=0.2mm/rev or under.

Vertical milling (Plunging)

Vertical milling (Plunging)



- Available for vertical milling (plunging).

Insert Description	Max. Width of Cut (ae)
LOGU03 type	3.5mm

- For vertical milling (plunging), reduce feed rate to fz=0.2mm/t or less.

Insert Grades	A
Turning	B
Indexable Inserts	C
CBN & PCBN Tools	D
External	E
Small Parts Machining	F
Boring	G
Grooving	H
Cut-off	J
Threading	K
Drilling	M
Milling	N
Tools for Turning Mill	P
Spare Parts	R
Technical Information	T