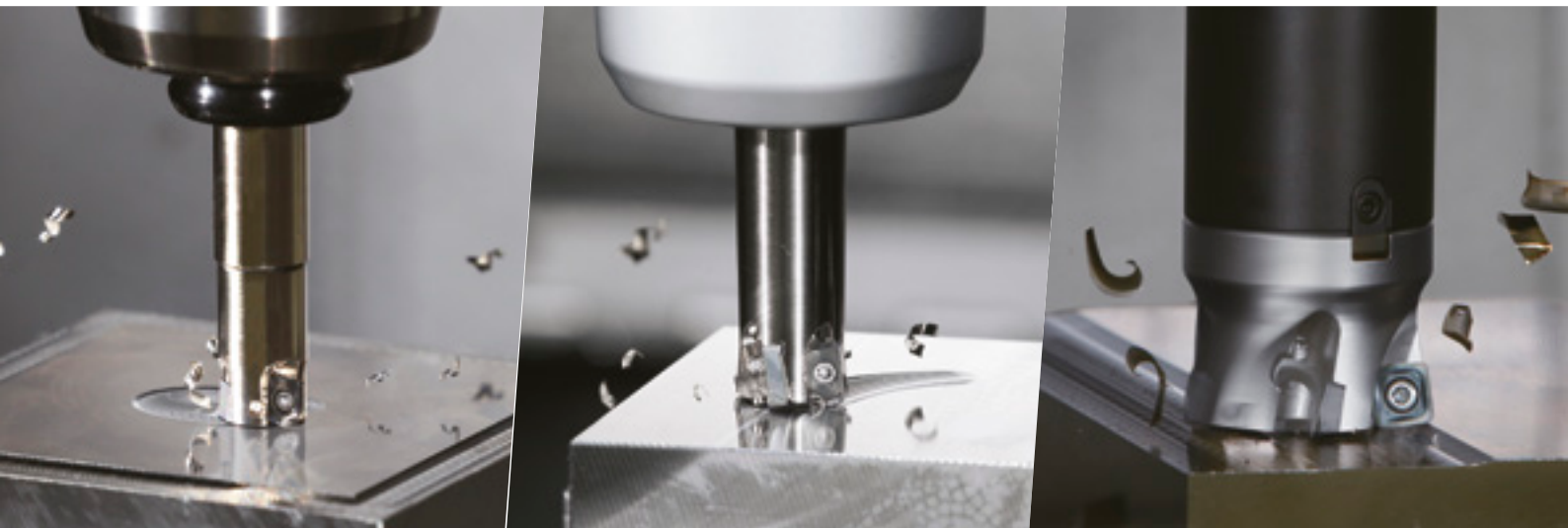


MFH Series



Stable machining with greater chatter resistance

Cutting diameters starting at Ø8 mm

Reduce cycle time during
roughing applications

MFH Mini / Micro high feed
mills for small machining
centers

New PR18 series grades are
now available

NEW

PR1810 / PR1825 / PR1835



MFH Micro
Ø8 – 16 mm

MFH Mini
Ø16 – 50 mm

MFH Harrier
Ø25 – 160 mm



High efficiency and high feed cutter

MFH Series

Convex cutting edge design reduces chatter for high-efficiency rough machining
Large tooling lineup from Ø8 to Ø160 to cover a wide application range for multiple metalworking processes.

MFH Micro

Replaces solid end mills to reduce machining costs



Cutter diameter (mm)

- End Mill Ø8 – 16
- Modular Ø8 – 16

MFH Mini

Economical inserts with 4 cutting edges



Cutter diameter (mm)

- End Mill Ø16 – 32
- Face Mill Ø40, Ø50
- Modular Ø16 – 32

MFH Harrier

4 Different insert designs offer a variety of machining options



Cutter diameter (mm)

- End Mill (SOMT10 Type) Ø25 – 40
(SOMT14 Type) Ø50, Ø63, Ø80
- Face Mill (SOMT10 Type) Ø50, Ø63, Ø80
(SOMT14 Type) Ø50 – 160
- Modular (SOMT10 Type) Ø25 – 40

1

Stable machining with excellent chattering resistance

Reduces cutting forces at initial impact with a convex helical edge design

Convex helical edge design



MFH Micro

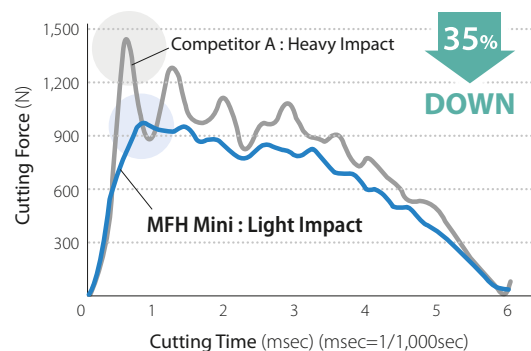


MFH Mini



MFH Harrier

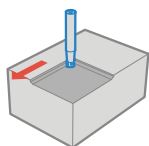
Cutting force and vibration when approaching the workpiece (internal evaluation)
Ae: Half of cutter diameter



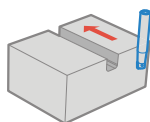
Cutting Conditions: $V_c = 150$ m/min, $f_z = 1.0$ mm/t, $a_p \times a_e = 0.5 \times 8$ mm, Dry
Cutter Dia. DC = Ø16 mm Workpiece: S50C

2

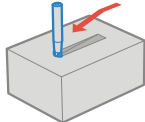
Wide application range for multiple metalworking processes



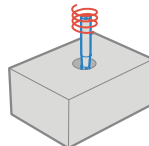
Face milling & shouldering



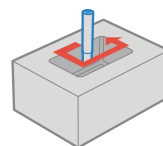
Slotting



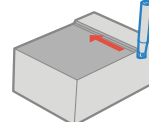
Ramping



Helical milling



Pocketing



Contouring

For using MFH Harrier:

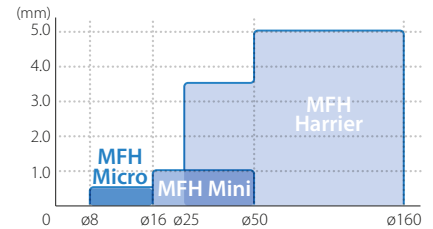
GM / GH chipbreaker are available for all the above applications. LD and FL chipbreakers are not available for helical milling, plunging and contouring of rising wall. Please refer to back cover.

Micro diameter cutter for high feed machining

MFH Micro Cutter dia. Ø8 – 16 mm

Low resistance and durable against chatter for highly efficient machining.

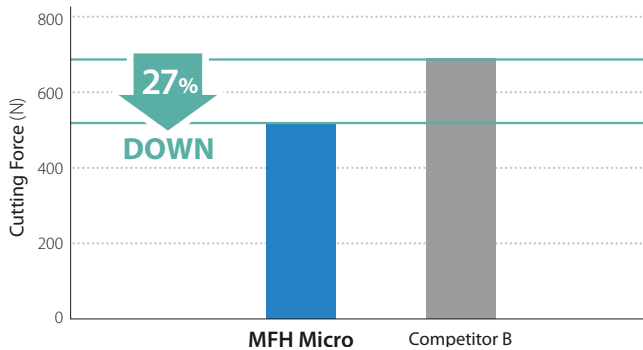
Maximum ap 0.5 mm. Stable high feed machining on a wide range of applications.



1 Low resistance and durable against chatter

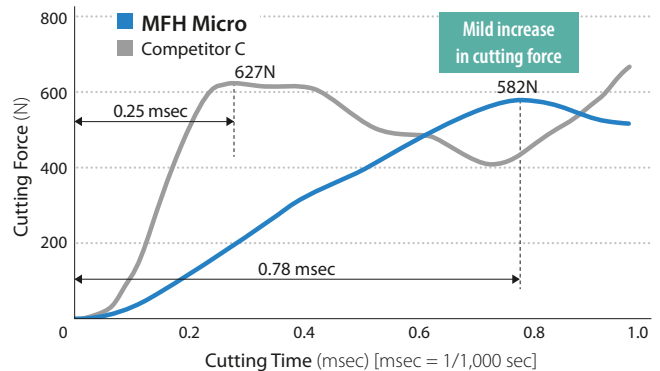
Molded convex cutting edge controls initial impact when entering the workpiece

Cutting force comparison (internal evaluation)



Cutting conditions: $V_c = 120$ m/min, $f_z = 0.6$ mm/t, $a_p = 0.4$ mm
Cutter dia. DC = Ø10 mm, slotting, dry, workpiece: S50C

Cutting force when entering workpiece comparison (internal evaluation)



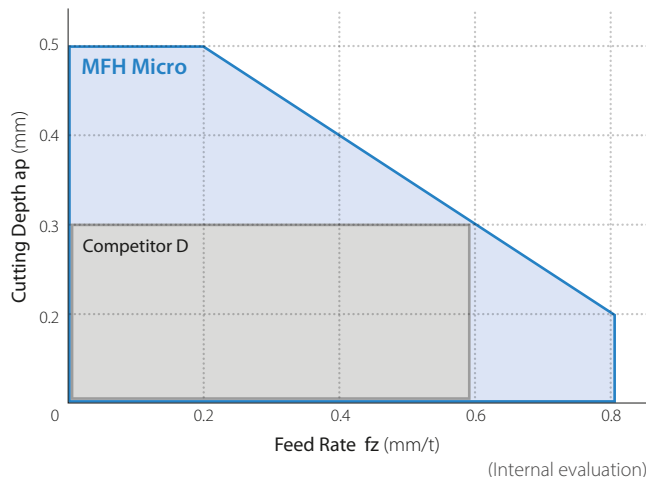
Cutting conditions: $V_c = 120$ m/min, $f_z = 0.6$ mm/t, $a_p \times a_e = 0.4 \times 5$ mm
Cutter dia. DC = Ø10 mm, dry, workpiece: S50C

2 Wide range of machining applications

Wide range of machining applications at a maximum depth of cut of 0.5 mm

Stable machining even with small machining center (BT30)

Cutting performance map (cutter diameter Ø10 mm)

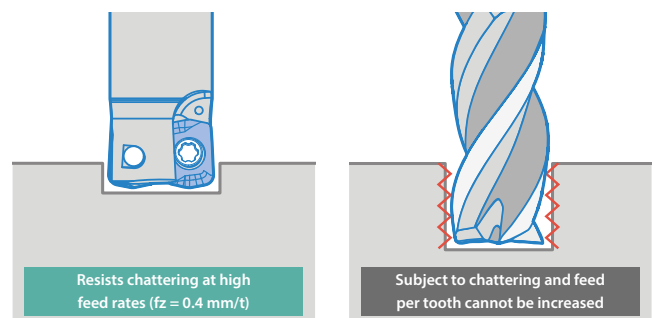


3 Replaces solid end mills to reduce machining costs

Suppresses chattering and increases milling efficiency

MFH micro compared to solid end mills (mechanical parts, slotting, workpiece S50C)

MFH Micro $Q = 15.3$ cc/min $V_c = 150$ m/min, $f_z = 0.4$ mm/t $a_p \times a_e = 0.4 \times 10$ mm, dry MFH10-S10-01-2T (2 inserts) LPGT010210ER-GM	 Efficiency	Solid end mill $Q = 12.2$ cc/min $V_c = 80$ m/min, $f_z = 0.04$ mm/t $a_p \times a_e = 3 \times 10$ mm, dry Ø10 (4 flutes)
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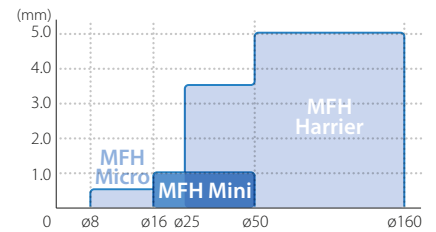


Small diameter cutter for high feed machining

MFH Mini

Cutter diameter $\varnothing 16 - 50$ mm

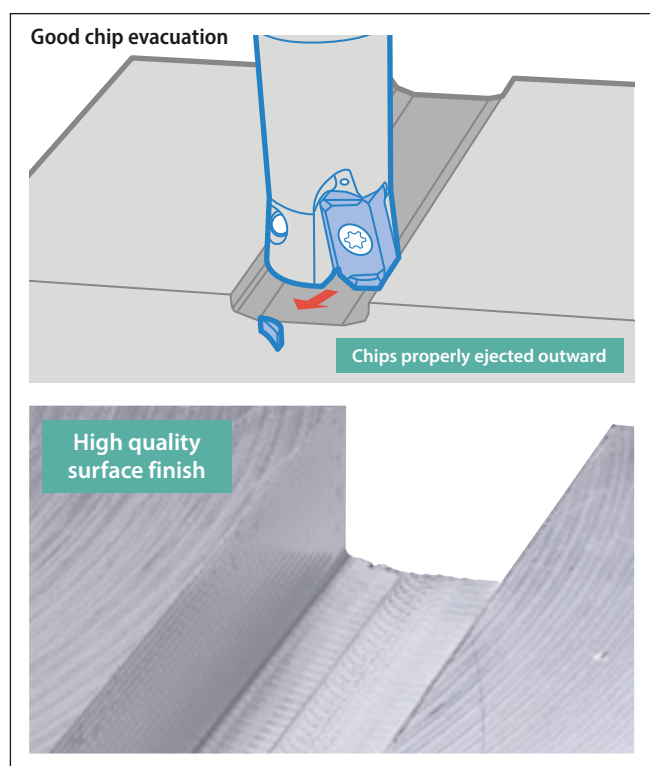
Economical inserts with 4 cutting edges. Small diameter fine pitch type for high efficiency and high feed machining.



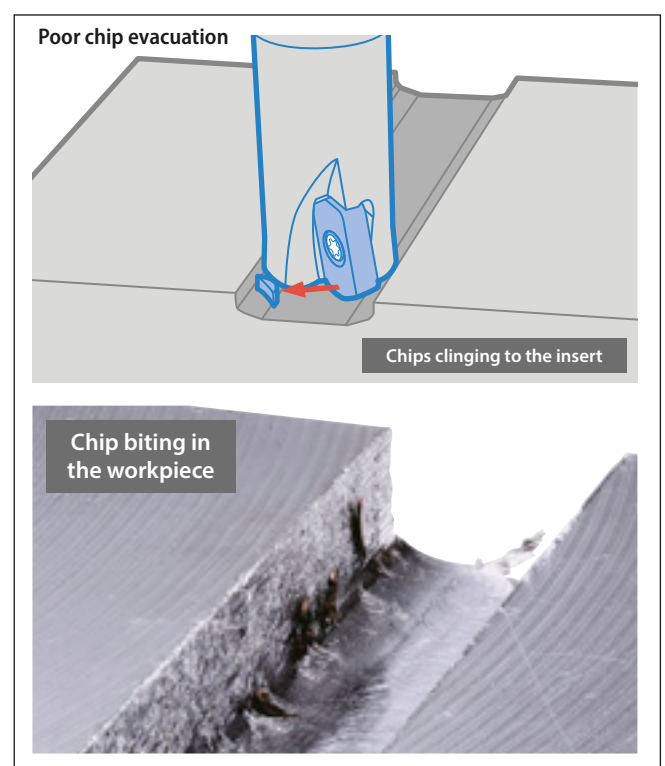
1 Good chip evacuation

MFH mini controls chip biting with convex cutting edge

MFH Mini



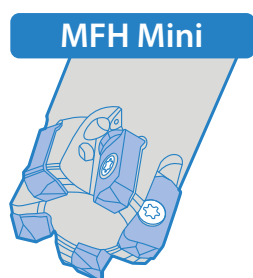
Competitor high feed cutter



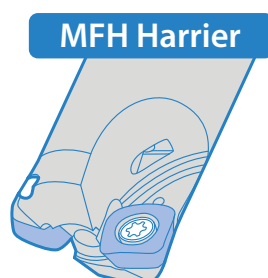
Cutting conditions: Cutter dia. DC = $\varnothing 16$ mm (2 inserts), $V_c = 150$ m/min, $f_z = 0.6$ mm/t, $a_p = 0.5$ mm (20 pass): Total 10 mm $\times$ 16 mm, dry, workpiece: SS400

2 Fine pitch for efficient machining

Cutter diameter 25 mm type



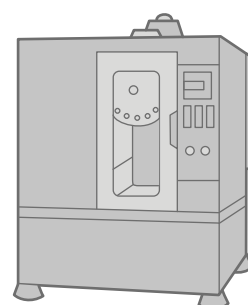
5 inserts MFH25-S25-03-5T



2 inserts MFH25-S25-10-2T

3 Suitable for roughing of molds

High feed machining in small machining centers



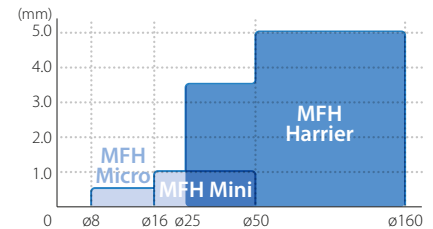
Applicable for BT30/ BT40

Highly efficiency and high feed cutter

MFH Harrier

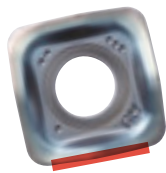
Cutter dia. Ø25 – 160 mm

Wide range of products for high feed machining
Large depths of cut and low cutting forces.



1 Large insert line-up for various applications

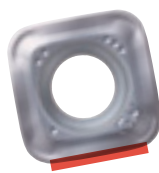
GM (general purpose)



First recommendation
for general machining

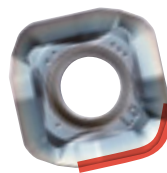
Multiple metalworking processes

GH (tough edge)



Excellent fracture resistance

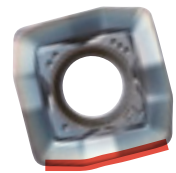
LD (large ap)



MAX. ap = 5 mm

Available for scale removal as
well as high feed cutting

FL (wiper edge)



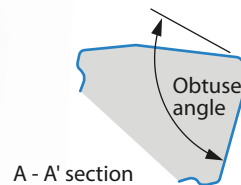
Wiper edge with low cutting forces

Excellent surface finish and
reduced chattering

GH chipbreaker with excellent fracture resistance

Convex cutting edge design

Reduces impact force when entering
workpiece
Suppresses chattering and fracturing



Tough edge design

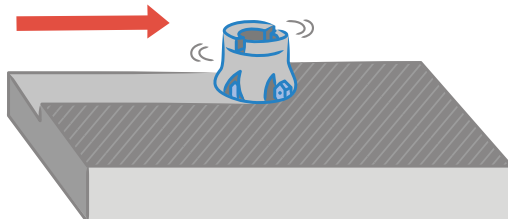
Combining with PR015S is suitable
for machining hardened material
Improved fracture resistance

Feature

LD chipbreaker can be used for both large ap and high feed machining

Large ap for scale removal

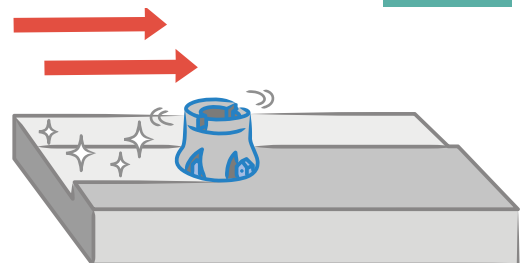
ap = 4.0 mm



(fz = 0.25 mm/t, ap = 4 mm)

High feed rates after scale removal

fz = 1.5 mm/t



(fz = 1.5 mm/t, ap = 2 mm)

MFH Harrier

MFH063R-14-5T-22M
(Cutter dia. 63 mm, 5 inserts)

Roughing for scale removal (2 passes): Large ap

Vc = 200 m/min, fz = 0.25 mm/t
ap × ae = 4 × 40 mm, Vf = 1,264 mm/min

Roughing (2 passes) after scale removal: High feed rate

Vc = 200 m/min, fz = 1.5 mm/t
ap × ae = 2 × 40 mm, Vf = 7,583 mm/min
Workpiece: SS400

Conventional 45° cutter Cutter dia. 63 mm, 5 inserts

Roughing (4 passes): Constant D.O.C. and feed rate

Vc = 200 m/min, fz = 0.25 mm/t
ap × ae = 3 × 40 mm, Vf = 1,264 mm/min
Workpiece: SS400

Chip Evacuation

MFH

404 cc/min

Conventional Cutter

151 cc/min

Efficiency

x2.6

NEW PR18 Series

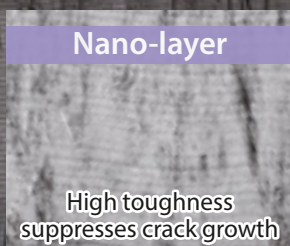
Double lamination technology with special nano layer
MEGACOAT NANO EX provides longer tool life
Features 3 grades: PR1825/PR1835/PR1810



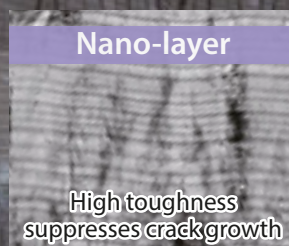
Double lamination technology maintains longer tool Life

Multi-layer structure with two unique nano layers
Superior abrasion resistance and fracture resistance

Special nano layer × multilayer lamination



AlCr-based coating
with excellent abrasion resistance



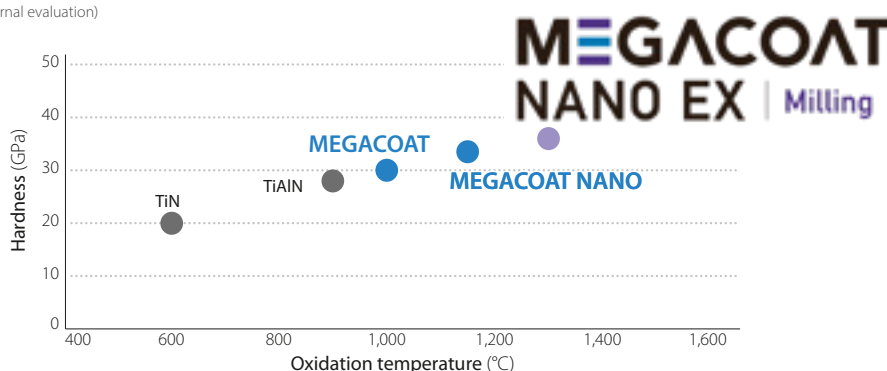
AlTi-based coating
with excellent heat resistance

Multi-layering of high-performance nano layers

Increases toughness with the suppression of crack growth and optimization of internal stress

CG Image

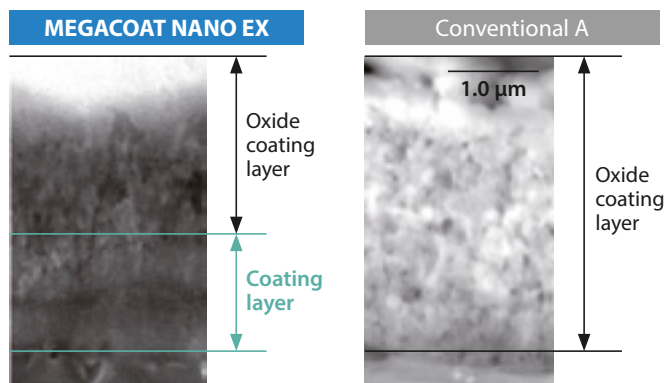
Coating characteristics (Internal evaluation)



Excellent oxidation resistance

Oxidation progression comparison (Internal evaluation)

Suppresses oxidation progression with excellent oxidation resistance

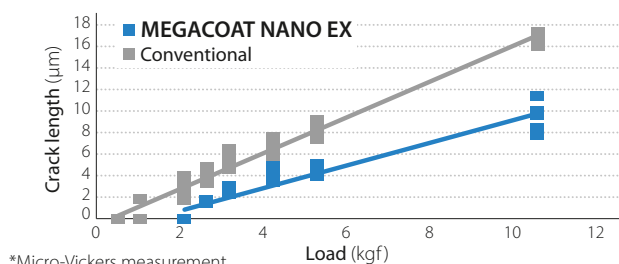
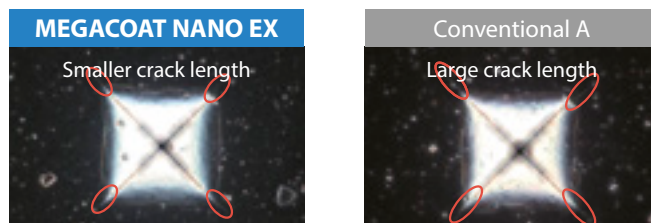


*Section after holding at 1,200 degrees for 30 minutes in air

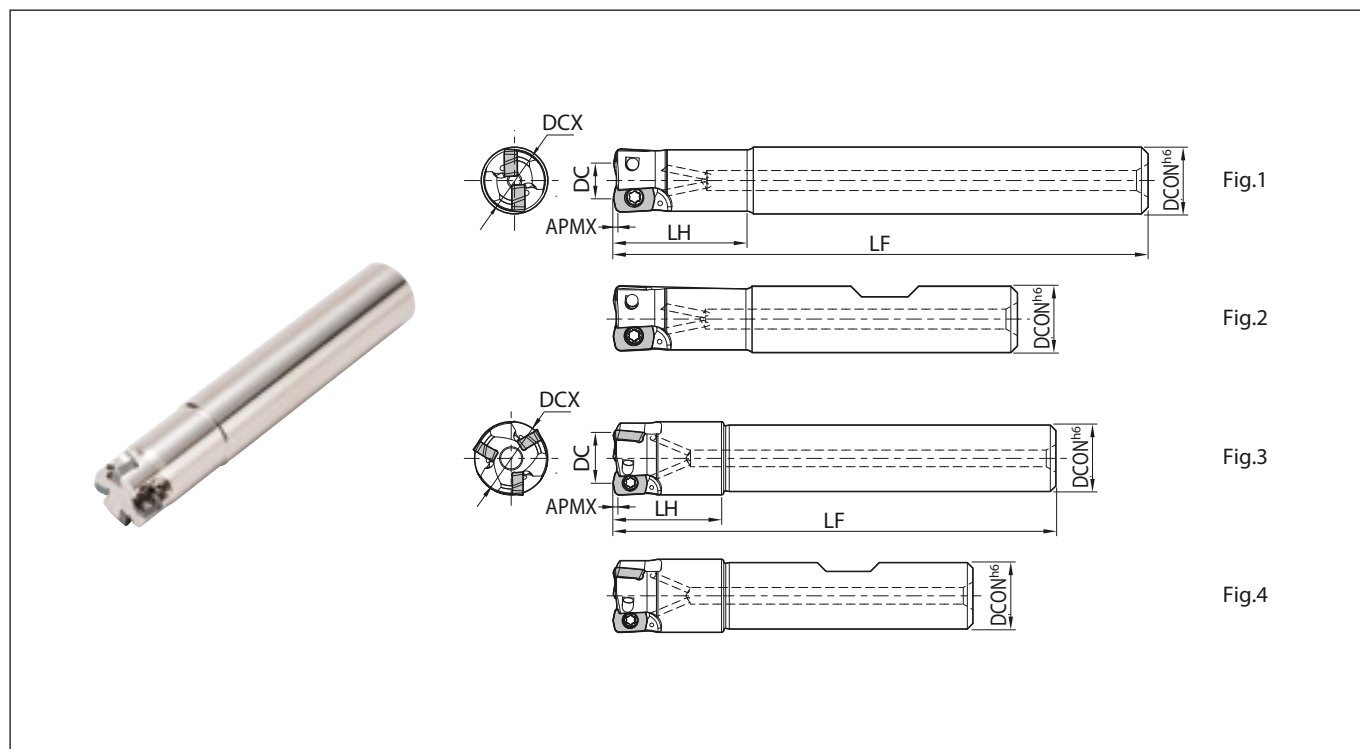
High coating toughness

Coating layer toughness evaluation (Internal evaluation)

Excellent coating toughness with small crack length



*Micro-Vickers measurement



Toolholder dimensions (Shank type)

Shank	Description	Avail-ability	No. of inserts	Dimensions (mm)						Max. ramping angle	Rake angle	Coolant hole	Drawing	Weight (kg)	Max. revolution (min ⁻¹)
				DCX	DC	DCON	LF	LH	APMX		A.R.				
Standard (Straight)	MFH08-S10-01-1T	●	1	8	4.2	10	75	16	0.5	4°	+5°	Yes	Fig.1	0.04	20,000
	MFH10-S10-01-2T	●	2	10	6.2	10	80	20		3°				0.04	16,200
	MFH12-S12-01-3T	●	3	12	8.2	12	80	20		2°				0.06	14,000
	MFH16-S16-01-4T	●	4	16	12.2	16	90	25		1.2°				0.12	11,400
Over size (Straight)	MFH14-S12-01-3T	●	3	14	10.2	12	80	20	0.5	1.5°	+5°	Yes	Fig.3	0.07	12,500
Standard (Weldon)	MFH08-W10-01-1T	●	1	8	4.2	10	58	16	0.5	4°	+5°	Yes	Fig.2	0.03	20,000
	MFH10-W10-01-2T	●	2	10	6.2	10	60	20		3°				0.03	16,200
	MFH12-W12-01-3T	●	3	12	8.2	12	65	20		2°				0.05	14,000
	MFH16-W16-01-4T	●	4	16	12.2	16	73	25		1.2°				0.1	11,400
Over size (Weldon)	MFH14-W12-01-3T	●	3	14	10.2	12	65	20	0.5	1.5°	+5°	Yes	Fig.4	0.05	12,500

Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 8. Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.

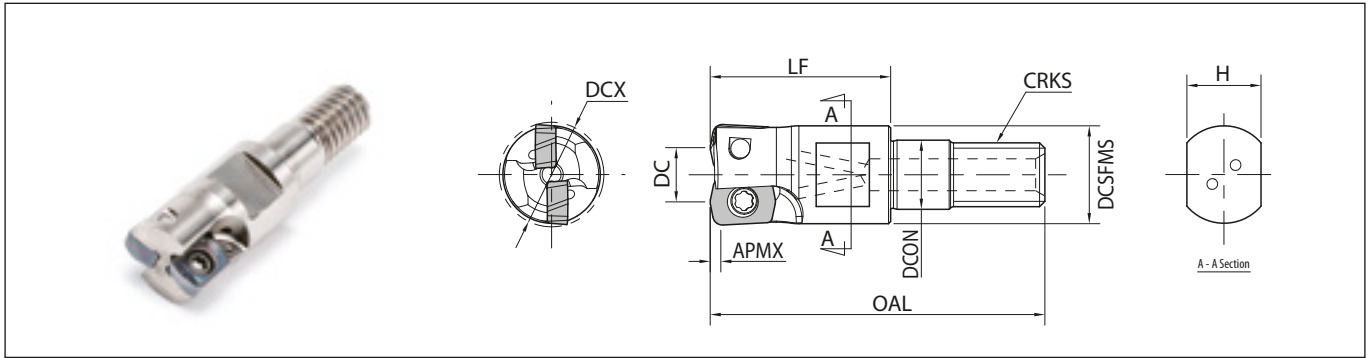
● : Available

Spare parts and applicable inserts

Description	Spare parts			Applicable inserts
	Clamp screw	Wrench	Anti-Seize compound	
MFH...-01-...	SB-1840TRP	FTP-6	P-37	LPGT010210ER-GM
	Recommended torque for insert clamp 0.5 nm			

Coat anti-seize compound (P-37) thinly on portion of taper and thread prior to installation.

MFH Micro | Screw on type



Toolholder dimensions

Description	Avail- ability	No. of inserts	Dimensions (mm)									Max. ramping angle	Rake angle A.R.	Coolant hole	Max. revolution (min ⁻¹)						
			DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX										
MFH08-M06-01-1T	●	1	8	4.2	9.2	6.5	30.5	17	M6×P1.0	7	0.5	4°	+5°	Yes	20,000						
MFH10-M06-01-2T	●	2	10	6.2								3°			16,200						
MFH12-M06-01-3T	●	3	12	8.2	11.2							2°			14,000						
MFH14-M06-01-3T	●	3	14	10.2								1.5°			12,500						
MFH16-M08-01-4T	●	4	16	12.2	14.7	8.5	39	22	M8×P1.25	12		1.2°					11,400				

Industry standard threads for adapting to common toolholders (For Ø8 – 14 mm screw size: M6 x P1.0).
Check screw specifications for the shank in use.

● : Available

Spare parts and applicable inserts

Description	Spare Parts			Applicable Inserts
	Clamp Screw	Wrench	Anti-Seize Compound	
MFH...-01-...	SB-1840TRP	FTP-6	P-37	LPGT010210ER-GM
Recommended torque for insert clamp 0.5 nm				

Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 8.

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

Coat anti-seize compound (P-37) thinly on portion of taper and thread prior to installation.

Actual end mill depth (MFH16-M08-01-4T)

	Arbor description	Applicable end mill (head)			Actual end mill depth (mm)
		Description	Cutter dia.	Dimensions	
			DC	LF	LUX
	BT30K-M08-45	MFH16-M08-01...	16	22	28.8
	BT40K-M08-55	MFH16-M08-01...	16	22	28.7

For BT type arbor, see page 21

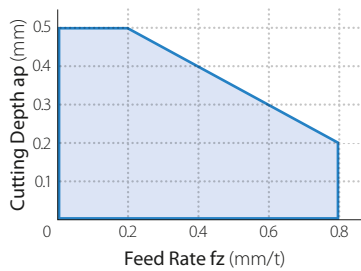
MFH Micro | Applicable inserts

Insert	Description	Dimensions (mm)					MEGACOAT NANO		CVD coated carbide
		W1	S	D1	INSL	RE	PR1835	PR1825	CA6535
 General purpose	 LPGT 010210ER-GM	4.19	2.19	2.1	6.26	1.0	●	●	●

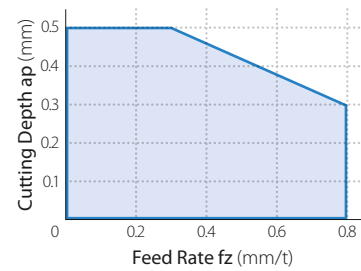
● : Availability

MFH Micro | Cutting performance

Cutting diameter: Ø8 – 12 mm



Cutting diameter: Ø14 – 16 mm



MFH Micro | Recommended cutting conditions ★ 1st recommendation ☆ 2nd recommendation

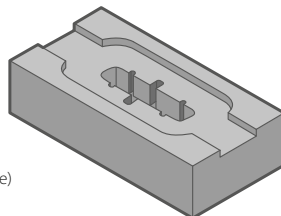
Insert	Workpiece	Holder description and feed rate (fz: mm/t) Recommended feed ap = 0.3 mm (reference value)					Recommended insert grade (Vc: m/min)		
		MFH08-... -1T	MFH10-... -2T	MFH12-... -3T	MFH14-... -3T	MFH16-... -4T	MEGACOAT NANO		CVD coated carbide
							PR1825	PR1835	CA6535
GM	Carbon steel	0.2 – 0.4 – 0.6			0.2 – 0.5 – 0.8		★ 120 – 180 – 250	☆ 120 – 180 – 250	–
	Alloy steel						★ 100 – 160 – 220	☆ 100 – 160 – 220	–
	Die steel ~40 HRC	0.2 – 0.3 – 0.5			0.2 – 0.4 – 0.6		★ 80 – 140 – 180	☆ 80 – 140 – 180	–
	Die steel 40~50 HRC	0.2 – 0.25 – 0.3			0.2 – 0.25 – 0.4		☆ 60 – 100 – 130	–	–
	Austenitic stainless steel	0.2 – 0.3 – 0.5			0.2 – 0.4 – 0.6		☆ 100 – 160 – 200	★ 100 – 160 – 200	–
	Martensitic stainless steel						–	☆ 150 – 200 – 250	★ 180 – 240 – 300
	Precipitation hardened stainless steel						–	★ 90 – 120 – 150	–
	Gray cast iron	0.2 – 0.4 – 0.6			0.2 – 0.5 – 0.8		★ 120 – 180 – 250	–	–
	Nodular cast iron	0.2 – 0.3 – 0.5			0.2 – 0.4 – 0.6		★ 100 – 150 – 200	–	–
	Ni-base heat-resistant alloy	0.2 – 0.25 – 0.3			0.2 – 0.25 – 0.4		–	☆ 20 – 30 – 50	★ 20 – 30 – 50
	Titanium alloy						–	★ 40 – 60 – 80	–

Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloy. The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation. Internal coolant is recommended for slotting applications.

Case studies

Mold SKD61

Vc = 90 m/min (n = 2,400 min⁻¹)
 ap × ae = 0.3 × ~ 0.7 mm
 fz = 0.27 mm/t (Vf = 1,930 mm/min)
 Dry
 MFH12-S12-01-3T (3 inserts)
 LPGT010210ER-GM PR1535 (Conventional grade)



Chip evacuation

PR1535 Ø12-3T **4.5 cc/min**

Efficiency
↑
x1.3

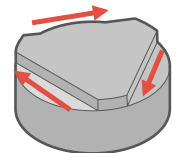
Competitor F Ø12-3T **3.4 cc/min**

PR1535 shows 1.3 times machining efficiency compared to Competitor F.
 Good cutting edge condition after machining almost doubling the tool life.

User evaluation

Industrial machine parts SUS440C

Vc = 180 m/min (n = 3,580 min⁻¹)
 ap × ae = 0.4 × 8 mm
 fz = 0.4 mm/t (Vf = 5,730 mm/min)
 Wet
 MFH16-S16-01-4T (4 inserts)
 LPGT010210ER-GM PR1535 (Conventional grade)



Cutting time

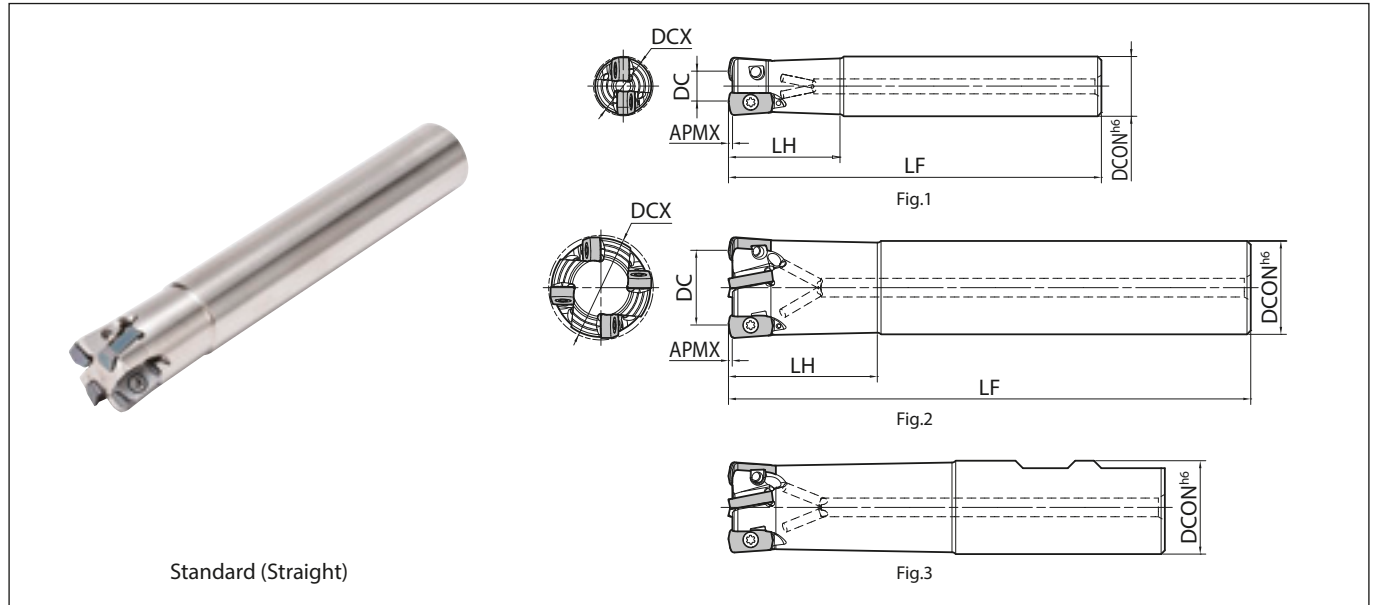
PR1535 **7 min**

35%
↓
Cutting time

Competitor G **11 min**

PR1535 shows 30% faster cycle time compared to competitor G.

User evaluation



Toolholder dimensions

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

● : Available

Spare parts and applicable inserts

Description	Spare parts				Applicable inserts
	Clamp screw	Wrench	Anti-seize compound	Arbor clamp bolt	
MFH...-03-...	SB-3065TRP	DTPM-8	P-37	—	LOGU030310ER-GM LOGU030310ER-GH
MFH040R-03-...-M	Recommended torque for insert clamp 1.2 nm			HH8×25	
MFH050R-03-8T-M				HH10×30	

Caution with max. revolution

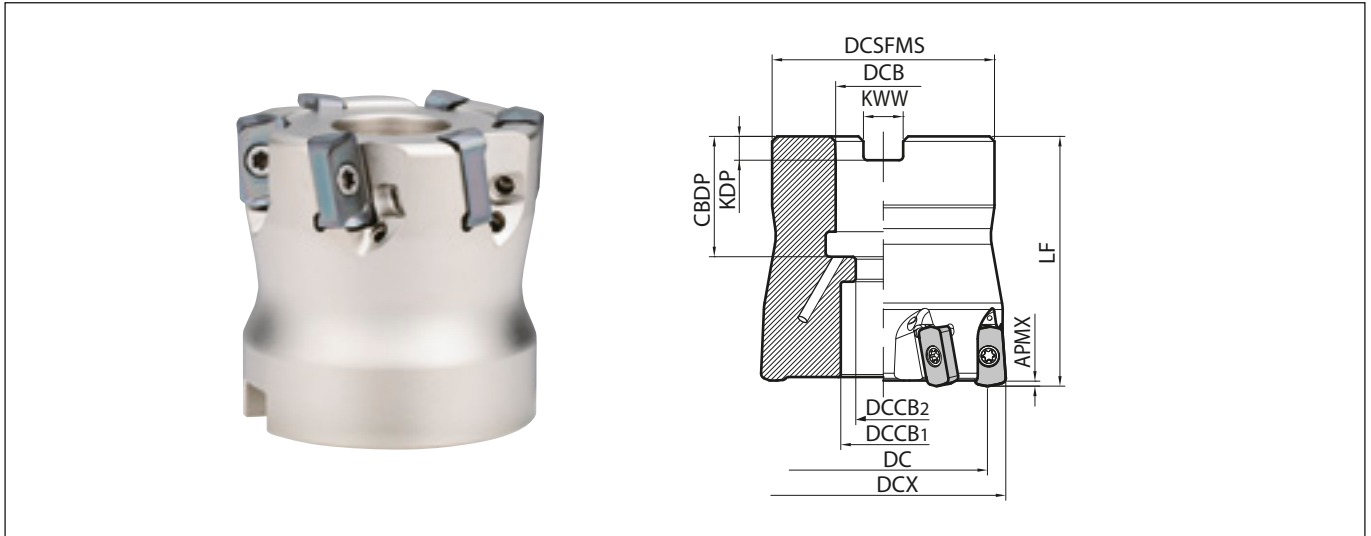
Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 12.

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

Coat anti-seize compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended cutting conditions → P12

MFH Mini | Face mill



Toolholder dimensions

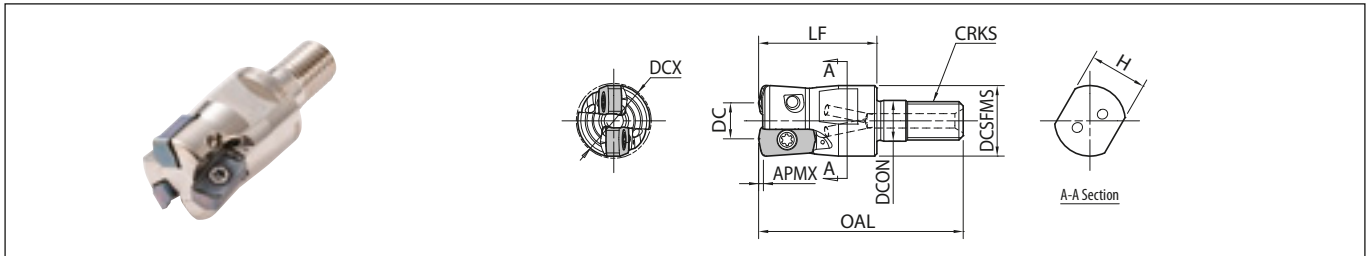
Description	Availability	No. of Inserts	Dimensions (mm)											Rake Angle	Coolant Hole	Weight (kg)	Max. Revolution (min ⁻¹)
			DCX	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R.			
MFH 040R-03-5T-M	●	5	40	32	38	16	15	9	40	19	5.6	8.4	1	—10°	Yes	0.2	9,900
040R-03-6T-M	●	6	40	32	38	16	15	9	40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

Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 12.
Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.

● : Available

MFH Mini | Screw on type



Toolholder dimensions

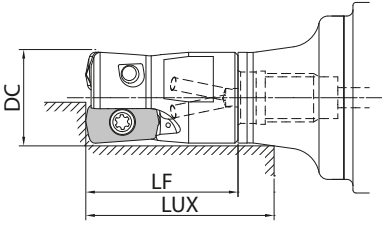
Description	Avail- ability	No. of Inserts	Dimensions (mm)									Rake Angle	Coolant Hole	Max. Revolution (min ⁻¹)
			DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R.		
MFH 16-M08-03-2T	●	2	16	8	14.7	8.5	42	25	M8×P1.25	12	1	−10°	Yes	18,880
MFH 17-M08-03-2T	●	2	17	9	14.7	8.5	42	25	M8×P1.25	12				17,900
MFH 18-M08-03-2T	●	2	18	10	14.7	8.5	42	25	M8×P1.25	12				17,000
MFH 20-M10-03-3T	●	3	20	12	18.7	10.5	48	30	M10×P1.5	15				15,700
20-M10-03-4T	●	4	20	12	18.7	10.5	48	30	M10×P1.5	15				15,700
MFH 22-M10-03-3T	●	3	22	14	18.7	10.5	48	30	M10×P1.5	15				14,700
22-M10-03-4T	●	4	22	14	18.7	10.5	48	30	M10×P1.5	15				14,700
MFH 25-M12-03-4T	●	4	25	17	23	12.5	56	35	M12×P1.75	19				13,400
25-M12-03-5T	●	5	25	17	23	12.5	56	35	M12×P1.75	19				13,400
MFH 28-M12-03-4T	●	4	28	20	23	12.5	56	35	M12×P1.75	19				12,400
28-M12-03-5T	●	5	28	20	23	12.5	56	35	M12×P1.75	19				12,400
MFH 32-M16-03-5T	●	5	32	24	30	17	62	40	M16×P2.0	24				11,400
32-M16-03-6T	●	6	32	24	30	17	62	40	M16×P2.0	24				11,400

Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 12.
Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.

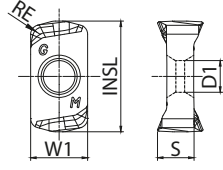
● : Available

Effective depth of assembled tool

	Arbor description	Applicable screw on type			Effective depth of assembled tool (mm)
		Description	Cutting diameter	Dimension	
			DC	LF	
BT30K-M08-45		MFH16-M08-03...	16	25	31.8
		MFH17-M08-03...	17	25	33.2
		MFH18-M08-03...	18	25	34.2
BT30K-M10-45		MFH20-M10-03...	20	30	36.8
		MFH22-M10-03...	22	30	39.2
BT30K-M12-45		MFH25-M12-03...	25	35	42.8
		MFH28-M12-03...	28	35	45.5
BT40K-M08-55		MFH16-M08-03...	16	25	31.7
		MFH17-M08-03...	17	25	33.2
		MFH18-M08-03...	18	25	34.3
BT40K-M10-60		MFH20-M10-03...	20	30	38.7
		MFH22-M10-03...	22	30	44.5
BT40K-M12-55		MFH25-M12-03...	25	35	44.6
		MFH28-M12-03...	28	35	47.6
BT40K-M16-65		MFH32-M16-03...	32	40	51.2

For BT type arbor, see page 21

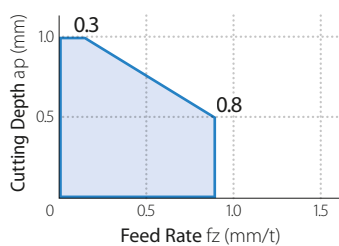
MFH Mini | Applicable inserts

Insert		Description	Dimensions (mm)					MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide
			W1	S	D1	INSL	RE	PR1835	PR1825	PR1810	PR0155	CA6535
 General purpose		LOGU030310ER-GM	6.2	3.96	3.45	11.9	1.0	●	●	●	—	●
	 Tough edge	LOGU030310ER-GH	6.2	3.96	3.45	11.9	1.0	●	●	●	●	—

● : Available

MFH Mini | Cutting performance

Fine pitch

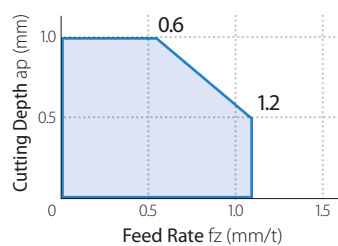


MFH20-...-4T, MFH22-...-4T,
MFH25-...-5T, MFH28-...-5T,
MF32-...-6T

Caution:

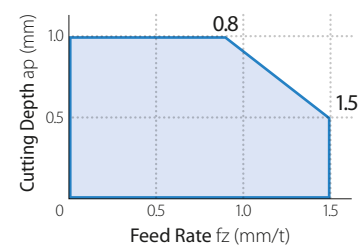
When using fine pitch, reduce the cutting conditions compared with standard type.

Standard pitch (cutter dia. 16 – 22 mm)



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

Face mill (cutter dia. 40 – 50 mm) Standard pitch (cutter dia. 25 – 32 mm)



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

Insert	Workpiece	Holder description and feed rate (fz: mm/t) Recommended feed ap = 0.5 mm (reference value)								Recommended insert grade (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
										PR1835	PR1825	PR1810	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 - 0.5 - 0.8	0.2 - 0.5 - 0.8	☆ 120 - 180 - 250	★ 120 - 180 - 250	-	-	-
	Alloy steel									☆ 100 - 160 - 220	★ 100 - 160 - 220	-	-	-
	Die steel	~40HRC	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 - 0.4 - 0.6	0.2 - 0.4 - 0.6	☆ 80 - 140 - 180	☆ 80 - 140 - 180	-	GH ★ 80 - 140 - 180	-
		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 - 0.25 - 0.3	-	☆ 60 - 100 - 130	-	GH ★ 60 - 100 - 130	-
		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 - 0.2 - 0.3	-	☆ 50 - 70 - 100	-	GH ★ 50 - 70 - 100	-
		55~60HRC	0.03 - 0.06 - 0.1 (* Recommended only for GH chipbreaker)							-	-	-	GH ☆ 50 - 60 - 70	-
	Austenitic stainless steel	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 - 0.4 - 0.6	0.2 - 0.4 - 0.6	GM ★ 100 - 160 - 200	GM ☆ 100 - 160 - 200	-	-	-
	Martensitic stainless steel									☆ 150 - 200 - 250	-	-	-	★ 180 - 240 - 300
	Precipitation hardened stainless steel									★ 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 - 0.5 - 0.8	0.2 - 0.5 - 0.8	-	-	★ 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 - 0.4 - 0.6	0.2 - 0.4 - 0.6	-	-	★ 100 - 150 - 200	-	-
	Ni-base heat-resistant alloy	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 - 0.25 - 0.4	0.2 - 0.25 - 0.4	☆ 20 - 30 - 50	-	-	-	★ 20 - 30 - 50
	Titanium alloy									GM ★ 40 - 60 - 80	-	GM ☆ 30 - 50 - 70	-	-

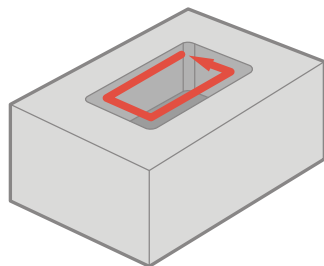
Standard pitch Fine pitch

- The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation
- Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloy
- Machining with BT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions
- Internal coolant is recommended for slotting applications
- Slotting and pocketing are not recommended for face mill type.

Case studies

Mold Parts / Pre-hardened steel

Vc = 220 m/min (n = 3,500 min⁻¹)
ap x ae = 0.5 x 14 mm
fz = 0.05 mm/t (Vf = 700 mm/min)
Dry
MFH20-S20-03-4T (4 inserts)
LOGU030310ER-GM PR1535
(Conventional grade)



Tool life

PR1535

2.0_H



Competitor H
(4 Inserts)

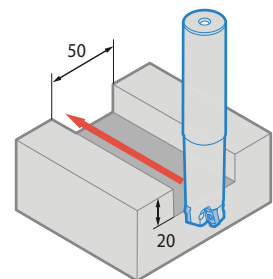
1.0~1.5_H

PR1535 shows lower cutting load compared to competitor H and can extend the machining time.

User evaluation

Airplane parts / Precipitation hardened stainless steel

Vc = 120 m/min (n = 1,530 min⁻¹)
ap x ae = 0.7 x ~ 25 mm
fz = 0.6 mm/t (Vf = 3,670 mm/min)
Dry
MFH25-S25-03-4T (4 inserts)
LOGU030310ER-GM PR1535
(Conventional grade)



Number of workpieces

PR1535

100 pcs

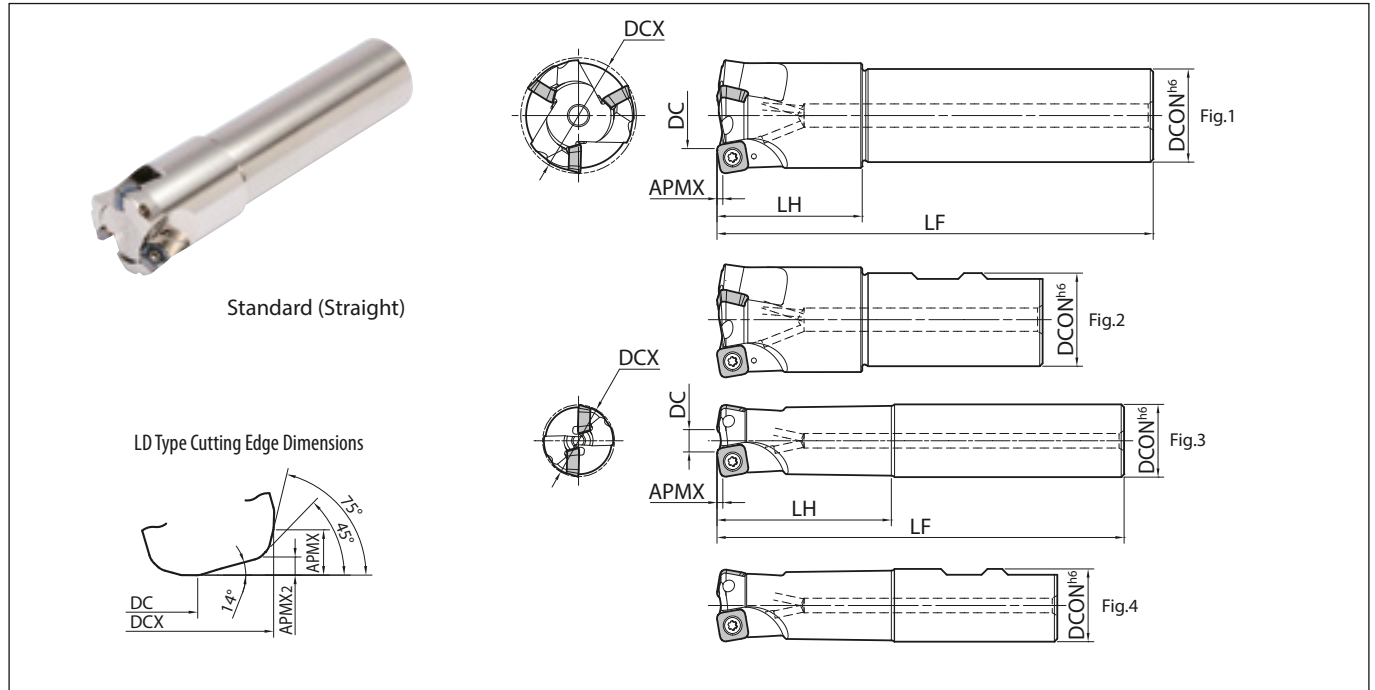


Competitor I
(5 Inserts)

55 pcs

PR1535 maintains good cutting edge condition after machining 100 pcs with stable machining.

User evaluation



Toolholder dimensions (SOMT10 type)

Shank	Description	Avail-ability	No. of inserts	Dimensions (mm)								Rake angle	Coolant hole	Drawing	Weight (kg)	Max. revolution (min-1)	
				DCX	DC			DCON	LF	LH	APMX	APMX ₂					A.R.
					GM-GH	LD	FL										
Standard (Straight)	MFH 25-S25-10-2T	●	2	25	8	12.5	11.5	25	140	60	1.5 (3.5) *	1.2	+10°	Yes	Fig.3	0.4	17,000
	MFH 28-S25-10-2T	●	2	28	11	15.5	14.5	25	140	40					Fig.1	0.5	15,500
	MFH 32-S32-10-2T	●	2	32	15	19.5	18.5	32	150	70					Fig.3	0.8	14,000
	32-S32-10-3T	●	3	32	15	19.5	18.5	32	150	70					Fig.1	0.8	14,000
	MFH 35-S32-10-2T	●	2	35	18	22.5	21.5	32	150	50						0.8	13,000
	35-S32-10-3T	●	3	35	18	22.5	21.5	32	150	50						0.8	13,000
	MFH 40-S32-10-3T	●	3	40	23	27.5	26.5	32	150	50						0.9	11,500
	40-S32-10-4T	●	4	40	23	27.5	26.5	32	150	50						0.9	11,500
Standard (Weldon)	MFH 25-W25-10-2T	●	2	25	8	12.5	11.5	25	117	60	1.5 (3.5) *	1.2	+10°	Yes	Fig.4	0.4	17,000
	MFH 32-W32-10-3T	●	3	32	15	19.5	18.5	32	131	70					0.7	14,000	
	MFH 40-W32-10-3T	●	3	40	23	27.5	26.5	32	112	50					Fig.2	0.7	11,500
	40-W32-10-4T	●	4	40	23	27.5	26.5	32	112	50					0.7	11,500	
Long shank (Straight)	MFH 25-S25-10-2T-200	●	2	25	8	12.5	11.5	25	200	120	1.5 (3.5) *	1.2	+10°	Yes	Fig.3	0.6	17,000
	MFH 28-S25-10-2T-200	●	2	28	11	15.5	14.5	25	200	40					Fig.1	0.7	15,500
	MFH 32-S32-10-2T-200	●	2	32	15	19.5	18.5	32	200	120					Fig.3	1.0	14,000
	MFH 35-S32-10-2T-200	●	2	35	18	22.5	21.5	32	200	50					Fig.1	1.4	13,000
	MFH 40-S32-10-4T-250	●	4	40	23	27.5	26.5	32	250	50						1.5	11,500
Extra song Shank (Straight)	MFH 25-S25-10-2T-300	●	2	25	8	12.5	11.5	25	300	180	1.5 (3.5) *	1.2	+10°	Yes	Fig.3	1.0	17,000
	MFH 28-S25-10-2T-300	●	2	28	11	15.5	14.5	25	300	40					Fig.1	1.1	15,500
	MFH 32-S32-10-2T-300	●	2	32	15	19.5	18.5	32	300	180					Fig.3	1.6	14,000
	MFH 35-S32-10-2T-300	●	2	35	18	22.5	21.5	32	300	50					Fig.1	1.7	13,000
	MFH 40-S32-10-4T-300	●	4	40	23	27.5	26.5	32	300	50						1.8	11,500

* Dimension in () is when mounting LD type ● : Available

Spare parts and applicable inserts

Description	Spare parts			Applicable inserts
	Clamp screw	Wrench	Anti-Seize compound	
				
MFH...-10-...	SB-4075TRP	DTPM-15	P-37	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
	Recommended Torque for Insert Clamp 3.5 nm			

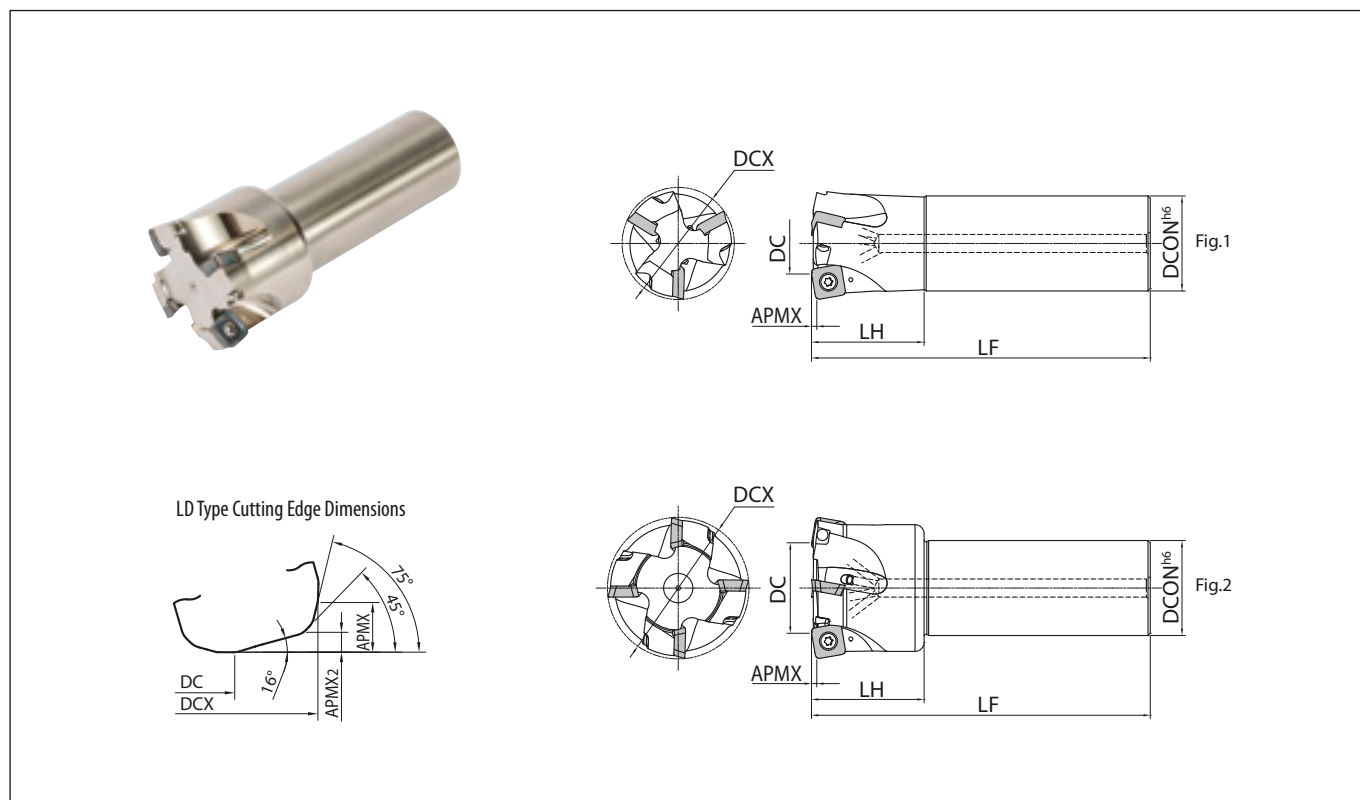
Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 19-20.

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

Coat anti-seize compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended cutting conditions → P19, P20



Toolholder dimensions (SOMT14 type)

Description	Avail-ability	No. of inserts	Dimensions (mm)									Rake angle	Coolant hole	Drawing	Weight (kg)	Max. revolution (min-1)
			DCX	DC			DCON	LF	LH	APMX	APMX ₂	A.R.				
				GM-GH	LD	FL										
MFH50-S42-14-3T	●	3	50	27	33	32	42	150	50	2 * (5)	2	+10°	Yes	Fig. 1	1.4	8,800
MFH63-S42-14-4T	●	4	63	40	46	45	42	150	50					Fig. 2	1.7	7,400
MFH80-S42-14-5T	●	5	80	57	63	62	42	150	50						2.3	6,400

* Dimension in () is when mounting LD type ● : Available

Spare parts and applicable inserts

Description	Spare parts			Applicable inserts
	Clamp screw	Wrench	Anti-Seize compound	
MFH...-14-...	SB-S0120TRP	TTP-20	P-37	SOMT140520ER-GM SOMT140520ER-GH SOMT140520ER-LD SOMT140514ER-FL
	Recommended torque for insert clamp 4.5 nm			

Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 19-20.

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

Coat anti-seize compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended cutting conditions → P19, P20

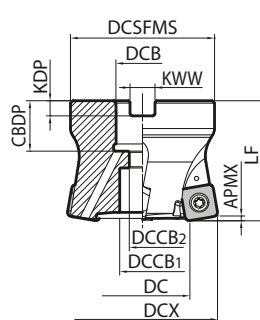


Fig.1

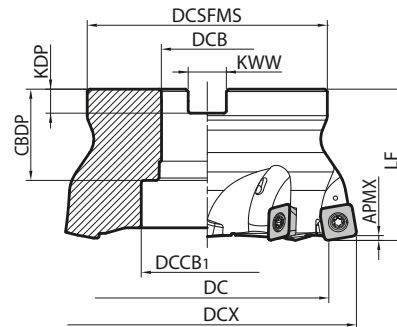


Fig.2

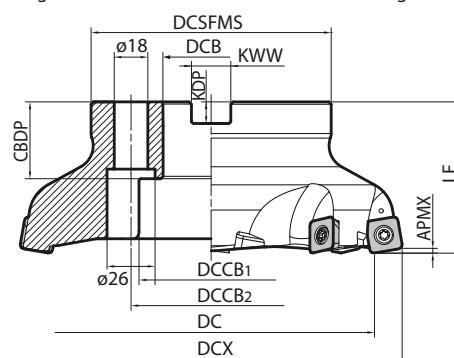


Fig.3

Toolholder dimensions (SOMT10 type)

Description	Availability	No. of inserts	Dimensions (mm)													Rake angle	Coolant hole	Drawing	Weight (kg)	Max. revolution (min-1)	
			DCX	DC			DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	APMX ₂ *1					A.R.
				GM-GH	LD	FL															
MFH 050R-10-4T-M	●	4	50	33	37.5	36.5	47	22	19	11	50	21	6.3	10.4	1.5 (3.5) *2	1.2	+10°	Yes	Fig.1	0.4	10,000
050R-10-5T-M	●	5	50	33	37.5	36.5	47	22	19	11	50	21	6.3	10.4						0.4	10,000
MFH 063R-10-5T-22M	●	5	63	46	50.5	49.5	60	22	19	11	50	21	6.3	10.4						0.7	8,800
063R-10-6T-22M	●	6	63	46	50.5	49.5	60	22	19	11	50	21	6.3	10.4						0.7	8,800
063R-10-5T-27M	●	5	63	46	50.5	49.5	60	27	20	13	50	24	7	12.4						0.7	8,800
063R-10-6T-27M	●	6	63	46	50.5	49.5	60	27	20	13	50	24	7	12.4						0.7	8,800
MFH 080R-10-7T-M	●	7	80	63	67.5	66.5	76	27	20	13	63	24	7	12.4						1.6	7,600

* 1 Refer to APMX 2 on Page 16 * 2 Dimension in () is when mounting LD type ● : Available

Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 19-20.

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

Toolholder dimensions (SOMT14 type)

Description	Availability	No. of Inserts	Dimensions (mm)													Rake angle	Coolant hole	Drawing	Weight (kg)	Max. revolution (min-1)	
			DCX	DC			DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	APMX ₂ *1					A.R.
				GM-GH	LD	FL															
MFH 050R-14-4T-M	●	4	50	27	33	32	47	22	12	—	50	21	6.3	10.4	2 (5) *2	2	+10°	Yes	Fig.1	0.4	8,800
MFH 063R-14-4T-22M	●	4	63	40	46	45	60	22	19	11	50	21	6.3	10.4						0.6	7,400
063R-14-5T-22M	●	5	63	40	46	45	60	22	19	11	50	21	6.3	10.4						0.6	7,400
063R-14-4T-27M	●	4	63	40	46	45	60	27	20	13	50	24	7	12.4						0.6	7,400
063R-14-5T-27M	●	5	63	40	46	45	60	27	20	13	50	24	7	12.4						0.6	7,400
MFH 080R-14-5T-M	●	5	80	57	63	62	76	27	20	13	63	24	7	12.4					Fig.2	1.4	6,400
080R-14-6T-M	●	6	80	57	63	62	76	27	20	13	63	24	7	12.4						1.4	6,400
MFH 100R-14-6T-M	●	6	100	77	83	82	96	32	26	17	63	28	8	14.4						2.4	5,600
100R-14-7T-M	●	7	100	77	83	82	96	32	26	17	63	28	8	14.4						2.4	5,600
MFH 125R-14-7T-M	●	7	125	102	108	107	100	40	55	—	63	33	9	16.4						2.8	4,800
MFH 160R-14-8T-M	●	8	160	137	143	142	100	40	68	66.7	63	32	9	16.4				No	Fig.3	3.7	4,200

MFH050R-14-4T and MFH050R-14-4T-M have double screws. Read the instruction manual attached to the toolholder for handling method.

*¹ Refer to APMX 2 on Page 16 *² Dimension in () is when mounting LD type ●: Available

Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 19-20.

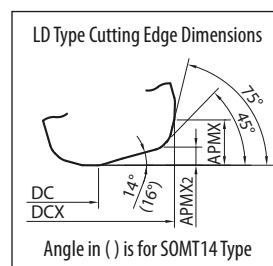
Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.

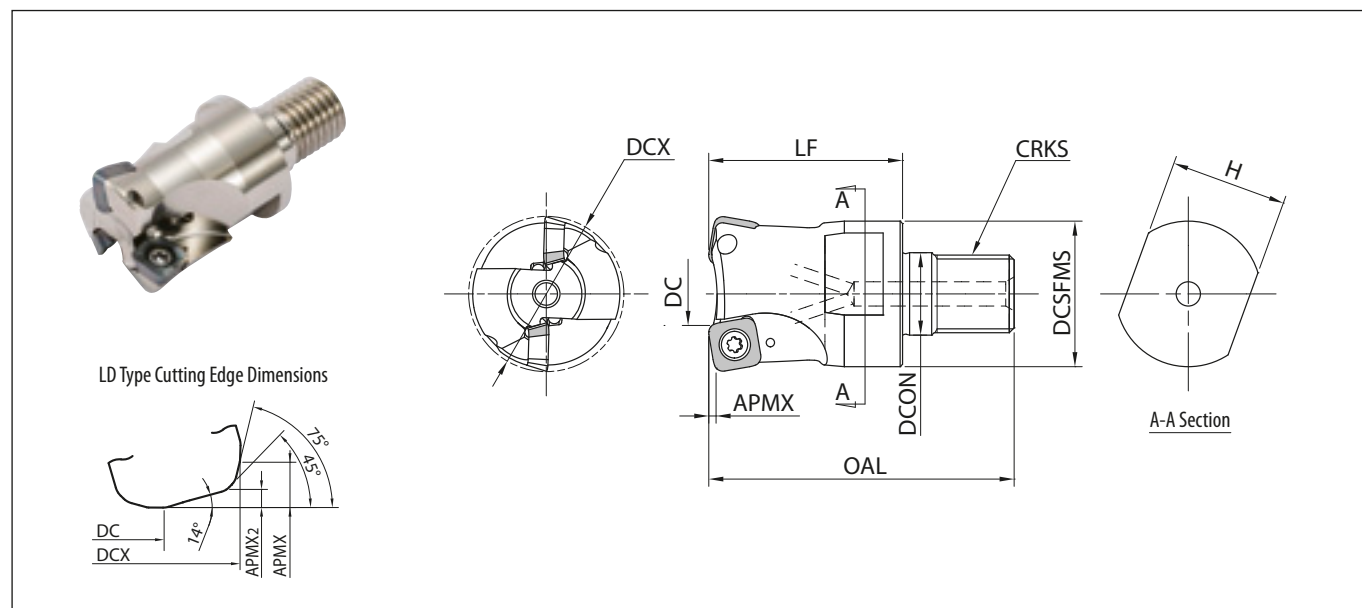
Spare parts and applicable inserts

Description	Spare Parts					Applicable Inserts
	Clamp Screw	Wrench		Anti-Seize Compound	Arbor Clamp Bolt	
		DTPM 	TTP 	MP-1 		
MFH050R-10-...(-M)	SB-4090TRPN	DTPM-15		P-37	HH10×30	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
MFH063R-10-...(-22M)					HH10×30	
MFH063R-10-...-27M					HH12×35	
MFH080R-10-...					HH16×40	
MFH080R-10-...-M					HH12×35	
MFH050R-14-...(-M)	SB-S0120TRP	TTP-20		P-37	W10×31	SOMT140520ER-GM SOMT140520ER-GH SOMT140520ER-LD SOMT140514ER-FL
MFH063R-14-...(-22M)					HH10×30	
MFH063R-14-...-27M					HH12×35	
MFH080R-14-...					HH16×40	
MFH080R-14-...-M					HH12×35	
MFH100R-14-...					HH16×40	
MFH100R-14-...-M					—	
MFH125R-14-...					—	
MFH160R-14-...					—	

• Coat anti-seize compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended cutting conditions → P19, P20





Toolholder dimensions

Description	Availability	No. of inserts	Dimensions (mm)												Rake angle	Coolant hole	Max. revolution (min-1)
			DCX	DC			DCSFMS	DCON	OAL	LF	CRKS	H	APMX	APMX ₂	A.R.		
MFH 25-M12-10-2T	●	2	25	8	12.5	11.5	23	12.5	56	35	M12×P1.75	19	1.5 (3.5) *	1.2	+10°	Yes	17,000
MFH 28-M12-10-2T	●	2	28	11	15.5	14.5	23	12.5	56	35	M12×P1.75	19					15,500
MFH 32-M16-10-2T	●	2	32	15	19.5	18.5	30	17	62	40	M16×P2.0	24					14,000
MFH 32-M16-10-3T	●	3	32	15	19.5	18.5	30	17	62	40	M16×P2.0	24					14,000
MFH 35-M16-10-2T	●	2	35	18	22.5	21.5	30	17	62	40	M16×P2.0	24					13,000
MFH 35-M16-10-3T	●	3	35	18	22.5	21.5	30	17	62	40	M16×P2.0	24					13,000
MFH 40-M16-10-3T	●	3	40	23	27.5	26.5	30	17	62	40	M16×P2.0	24					11,500
MFH 40-M16-10-4T	●	4	40	23	27.5	26.5	30	17	62	40	M16×P2.0	24					11,500

Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 19-20. Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.

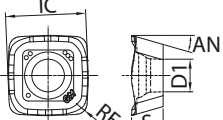
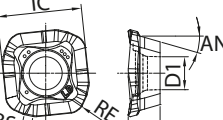
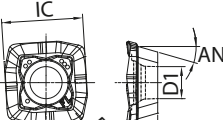
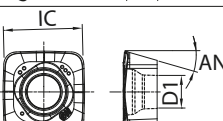
* Dimension in () is when mounting LD type ●: Available

Spare parts and applicable inserts

Description	Spare parts			Applicable inserts
	Clamp screw	Wrench	Anti-Seize compound	
				
MFH...-10-...	SB-4075TRP	DTPM-15	P-37	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
	Recommended torque for insert clamp 3.5 Nm			

• Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

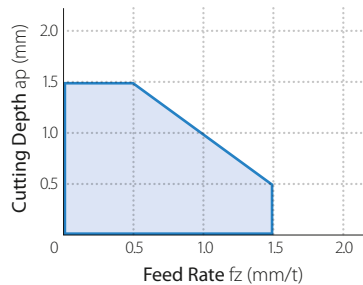
Recommended cutting conditions → p19, p20

Classification of usage		P	Carbon steel / alloy steel					☆	★					Applicable toolholders
			Die steel					☆	★					
★ : Roughing / 1st choice ☆ : Roughing / 2nd choice ■ : Finishing / 1st choice □ : Finishing / 2nd choice		M	Austenitic stainless steel					★	☆					
			Martensitic stainless steel					☆					★	
			Precipitation hardened stainless steel					★						
		K	Gray cast iron							★				
			Nodular cast iron							★				
		S	Ni-base heat-resistant alloy					★					☆	
			Titanium alloy (ti-6al-4v)					★		☆				
		H	High hardness steel						□		★			
Insert		Description	Dimensions (mm)					Angle (°)	MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide	
			IC	S	D1	BS	RE		PR1835	PR1825	PR1810	PR0155	CA6535	
 General purpose		SOMT100420ER-GM	10.30	4.58	4.6	—	2.0	16	●	●	●	—	●	P13 ~ P17
		SOMT140520ER-GM	14.14	5.56	5.8	—	2.0	16	●	●	●	—	●	
 Large ap		SOMT100420ER-LD	10.45	4.58	4.6	0.9	2.0	16	●	●	●	—	●	
		SOMT140520ER-LD	14.76	5.56	5.8	1.6	2.0	16	●	●	●	—	●	
 Wiper edge		SOMT100420ER-FL	10.44	4.58	4.6	1.4	2.0	16	●	●	●	—	●	
		SOMT140514ER-FL	14.57	5.56	5.8	3.1	1.4	16	●	●	●	—	●	
 Tough edge		SOMT100420ER-GH	10.43	4.57	4.55	—	2.0	16	●	●	●	●	—	
		SOMT140520ER-GH	14.17	5.56	5.8	—	2.0	16	●	●	●	●	—	

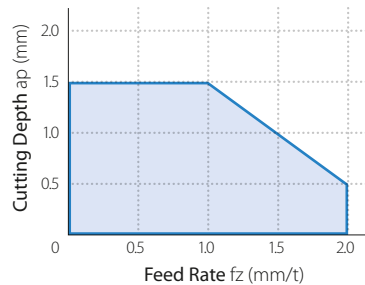
● : Available

MFH Harrier | Cutting performance (GM/GH/FL)

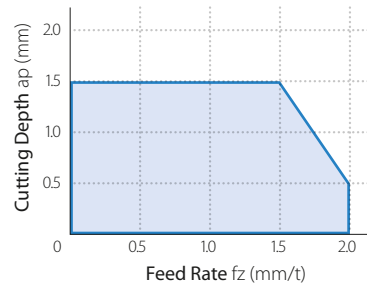
MFH25-S25-10-2T



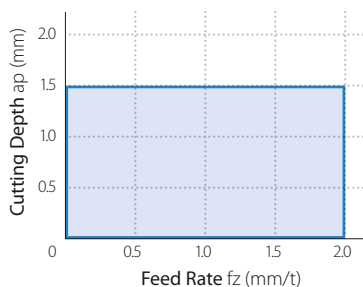
MFH32-S32-10-○T



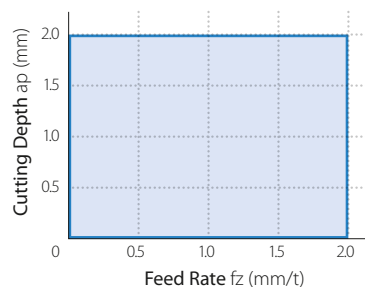
MFH40-S32-10-○T



MFH050R~080R-10-○T



MFH..-14-○T



LD chipbreaker:

- MAX D.O.C. for LD chipbreaker is 5 mm (3.5 mm for SOMT10 type)
- End mill: Please refer to the application map above
- Face mill: Maximum feed rate (feed per tooth)
fz = 2.0 mm/t

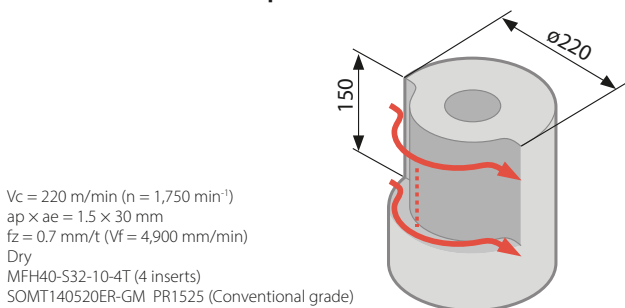
Insert	Workpiece	Holder description and feed rate (fz: mm/t)					Recommended insert grade (Vc: m/min)					
		MFH25-	MFH32-	MFH40-	MFH...R-10	MFH...-14	MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide	
							PR1835	PR1825	PR1810	PR015S	CA6535	
GM GH	Carbon steel	0.5 - 0.8 - 1.0 (ap≤1.0mm) 0.2 - 0.4 - 0.5 (ap≤1.5mm)	0.5 - 1.0 - 1.5 (ap≤1.0mm) 0.3 - 0.7 - 1.0 (ap≤1.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.4 - 1.0 - 1.5 (ap≤1.5mm)	0.5 - 1.5 - 2.0		☆ 120 - 180 - 250	★ 120 - 180 - 250	—	—	—	
	Alloy steel	0.5 - 0.8 - 1.0 (ap≤1.0mm) 0.2 - 0.4 - 0.5 (ap≤1.5mm)	0.5 - 1.0 - 1.5 (ap≤1.0mm) 0.3 - 0.7 - 1.0 (ap≤1.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.4 - 1.0 - 1.5 (ap≤1.5mm)	0.5 - 1.5 - 2.0		☆ 100 - 160 - 220	★ 100 - 160 - 220	—	—	—	
	Die steel	~40HRC	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		☆ 80 - 140 - 180	☆ 80 - 140 - 180	—	GH ★ 80 - 140 - 180	—
		40~50HRC	0.15 - 0.3 - 0.5 (ap≤1.0mm) 0.15 - 0.2 - 0.25 (ap≤1.5mm)	0.2 - 0.5 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.45 (ap≤1.5mm)	0.2 - 0.6 - 0.9 (ap≤1.0mm) 0.2 - 0.5 - 0.7 (ap≤1.5mm)	0.2 - 0.7 - 1.0		—	☆ 60 - 100 - 130	—	GH ★ 60 - 100 - 130	—
		50~55HRC	0.15 - 0.25 - 0.4 (ap≤1.0mm)	0.15 - 0.35 - 0.6 (ap≤1.0mm)	0.15 - 0.4 - 0.7 (ap≤1.0mm)	0.2 - 0.5 - 0.8		—	☆ 50 - 70 - 100	—	GH ★ 50 - 70 - 100	—
		55~60HRC	0.03 - 0.06 - 0.1 (ap ≤1.0mm) (* Recommended only for GH chipbreaker)					—	—	—	GH ☆ 50 - 60 - 70	—
	Austenitic stainless steel	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		GM ☆ 100 - 160 - 200	GM ☆ 100 - 160 - 200	—	—	—	
	Martensitic stainless steel	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		☆ 150 - 200 - 250	—	—	—	★ 180 - 240 - 300	
	Precipitation hardened stainless steel	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		★ 90 - 120 - 150	—	—	—	—	
	Gray cast iron	0.5 - 0.8 - 1.0 (ap≤1.0mm) 0.2 - 0.4 - 0.5 (ap≤1.5mm)	0.5 - 1.0 - 1.5 (ap≤1.0mm) 0.3 - 0.7 - 1.0 (ap≤1.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.4 - 1.0 - 1.5 (ap≤1.5mm)	0.5 - 1.5 - 2.0		—	—	★ 120 - 180 - 250	—	—	
	Nodular cast iron	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		—	—	★ 100 - 150 - 200	—	—	
	Ni-base heat-resistant alloy	0.2 - 0.4 - 0.6 (ap≤1.0mm) 0.15 - 0.2 - 0.3 (ap ≤ 1.5mm)	0.2 - 0.5 - 0.9 (ap≤1.0mm) 0.2 - 0.4 - 0.6 (ap≤1.5mm)	0.2 - 0.6 - 1.0 (ap≤1.0mm) 0.2 - 0.5 - 0.8 (ap≤1.5mm)	0.2 - 0.8 - 1.2		☆ 20 - 30 - 50	—	—	—	★ 20 - 30 - 50	
	Titanium alloy	0.2 - 0.4 - 0.6 (ap≤1.0mm) 0.15 - 0.2 - 0.3 (ap ≤ 1.5mm)	0.2 - 0.5 - 0.9 (ap≤1.0mm) 0.2 - 0.4 - 0.6 (ap≤1.5mm)	0.2 - 0.6 - 1.0 (ap≤1.0mm) 0.2 - 0.5 - 0.8 (ap≤1.5mm)	0.2 - 0.8 - 1.2		GM ★ 40 - 60 - 80	—	GM ☆ 30 - 50 - 70	—	—	
LD	Carbon steel	0.5 - 0.8 - 1.0 (ap≤1.0mm) 0.06 - 0.1 - 0.2 (ap≤3.5mm)	0.5 - 1.0 - 1.5 (ap≤1.0mm) 0.06 - 0.15 - 0.3 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.06 - 0.2 - 0.3 (ap≤3.5mm)	0.5 - 1.5 - 2.0 (ap≤1.0mm) 0.06 - 0.2 - 0.3 (ap≤3.5mm)	0.5 - 1.5 - 2.0 (ap≤2.0mm) 0.06 - 0.2 - 0.4 (ap≤5.0mm)	☆ 120 - 180 - 250	★ 120 - 180 - 250	—	—	—	
	Alloy steel	0.5 - 0.8 - 1.0 (ap≤1.0mm) 0.06 - 0.1 - 0.2 (ap≤3.5mm)	0.5 - 1.0 - 1.5 (ap≤1.0mm) 0.06~0.15~0.3 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.06 - 0.2 - 0.3 (ap≤3.5mm)	0.5 - 1.5 - 2.0 (ap≤1.0mm) 0.06 - 0.2 - 0.3 (ap≤3.5mm)	0.5 - 1.5 - 2.0 (ap≤2.0mm) 0.06 - 0.2 - 0.4 (ap≤5.0mm)	☆ 100 - 160 - 220	★ 100 - 160 - 220	—	—	—	
	Die steel ~40 HRC	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.06 - 0.08 - 0.15 (ap≤3.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.06 - 0.1 - 0.2 (ap≤3.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤2.0mm) 0.06 - 0.15 - 0.3 (ap≤5.0mm)	☆ 80 - 140 - 180	★ 80 - 140 - 180	—	—	—	
	Die steel 40~50 HRC	0.2 - 0.3 - 0.5 (ap≤1.0mm) 0.03 - 0.05 - 0.1 (ap≤3.5mm)	0.2 - 0.5 - 0.8 (ap≤1.0mm) 0.03 - 0.08 - 0.15 (ap≤3.5mm)	0.2 - 0.6 - 0.9 (ap≤1.0mm) 0.03 - 0.1 - 0.15 (ap≤3.5mm)	0.2 - 0.7 - 1.0 (ap≤1.0mm) 0.03 - 0.1 - 0.15 (ap≤3.5mm)	0.2 - 0.7 - 1.0 (ap≤2.0mm) 0.03 - 0.1 - 0.2 (ap≤5.0mm)	☆ 60 - 100 - 130	★ 60 - 100 - 130	—	—	—	
	Austenitic stainless steel	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.06 - 0.08 - 0.15 (ap≤3.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.06 - 0.1 - 0.2 (ap≤3.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤2.0mm) 0.06 - 0.15 - 0.3 (ap≤5.0mm)	★ 100 - 160 - 200	☆ 100 - 160 - 200	—	—	—	
	Martensitic stainless steel	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.06 - 0.08 - 0.15 (ap≤3.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.06 - 0.1 - 0.2 (ap≤3.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤2.0mm) 0.06 - 0.15 - 0.3 (ap≤5.0mm)	☆ 150 - 200 - 250	—	—	—	★ 180 - 240 - 300	
	Precipitation hardened Stainless steel	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.06 - 0.08 - 0.15 (ap≤3.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.06 - 0.1 - 0.2 (ap≤3.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤2.0mm) 0.06 - 0.15 - 0.3 (ap≤5.0mm)	★ 90 - 120 - 150	—	—	—	—	
	Gray cast iron	0.5 - 0.8 - 1.0 (ap≤1.0mm) 0.06 - 0.1 - 0.2 (ap≤3.5mm)	0.5 - 1.0 - 1.5 (ap≤1.0mm) 0.06 - 0.15 - 0.3 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.06 - 0.2 - 0.3 (ap≤3.5mm)	0.5 - 1.5 - 2.0 (ap≤1.0mm) 0.06 - 0.2 - 0.3 (ap≤3.5mm)	0.5 - 1.5 - 2.0 (ap≤2.0mm) 0.06 - 0.2 - 0.4 (ap≤5.0mm)	—	—	★ 120 - 180 - 250	—	—	
	Nodular cast iron	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.06 - 0.08 - 0.15 (ap≤3.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.06 - 0.1 - 0.2 (ap≤3.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.06 - 0.15 - 0.2 (ap≤3.5mm)	0.5 - 1.2 - 1.8 (ap≤2.0mm) 0.06 - 0.15 - 0.3 (ap≤5.0mm)	—	—	★ 100 - 150 - 200	—	—	
	Ni-base heat-resistant alloy	0.2 - 0.4 - 0.6 (ap≤1.0mm) 0.03 - 0.05 - 0.1 (ap≤3.5mm)	0.2 - 0.5 - 0.9 (ap≤1.0mm) 0.03 - 0.08 - 0.15 (ap≤3.5mm)	0.2 - 0.6 - 1.0 (ap≤1.0mm) 0.03 - 0.1 - 0.15 (ap≤3.5mm)	0.2 - 0.8 - 1.2 (ap≤1.0mm) 0.03 - 0.1 - 0.15 (ap≤3.5mm)	0.2 - 0.8 - 1.2 (ap≤2.0mm) 0.03 - 0.1 - 0.2 (ap≤5.0mm)	☆ 20 - 30 - 50	—	—	—	★ 20 - 30 - 50	
	Titanium sloy	0.2 - 0.4 - 0.6 (ap≤1.0mm) 0.03 - 0.05 - 0.1 (ap≤3.5mm)	0.2 - 0.5 - 0.9 (ap≤1.0mm) 0.03 - 0.08 - 0.15 (ap≤3.5mm)	0.2 - 0.6 - 1.0 (ap≤1.0mm) 0.03 - 0.1 - 0.15 (ap≤3.5mm)	0.2 - 0.8 - 1.2 (ap≤1.0mm) 0.03 - 0.1 - 0.15 (ap≤3.5mm)	0.2 - 0.8 - 1.2 (ap≤2.0mm) 0.03 - 0.1 - 0.2 (ap≤5.0mm)	★ 40 - 60 - 80	—	☆ 30 - 50 - 70	—	—	

Insert	Workpiece	Holder description and feed rate (fz: mm/t)					Recommended insert grade (vc: m/min)				
		MFH25-	MFH32-	MFH40-	MFH...R-10	MFH...-14	MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide
							PR1835	PR1825	PR1810	PR0155	CA6535
FL	Carbon steel	0.5 - 0.8 - 1.0 (ap≤1.0mm) 0.2 - 0.4 - 0.5 (ap≤1.5mm)	0.5 - 1.0 - 1.5 (ap≤1.0mm) 0.3 - 0.7 - 1.0 (ap≤1.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.4 - 1.0 - 1.5 (ap≤1.5mm)	0.5 - 1.5 - 2.0		☆ 120 - 180 - 250	★ 120 - 180 - 250	—	—	—
	Alloy steel	0.5 - 0.8 - 1.0 (ap≤1.0mm) 0.2 - 0.4 - 0.5 (ap≤1.5mm)	0.5 - 1.0 - 1.5 (ap≤1.0mm) 0.3 - 0.7 - 1.0 (ap≤1.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.4 - 1.0 - 1.5 (ap≤1.5mm)	0.5 - 1.5 - 2.0		☆ 100 - 160 - 220	★ 100 - 160 - 220	—	—	—
	Die steel ~40HRC	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		☆ 80 - 140 - 180	★ 80 - 140 - 180	—	—	—
	Die steel 40~50 HRC	0.15 - 0.3 - 0.5 (ap≤1.0mm) 0.15 - 0.2 - 0.25 (ap≤1.5mm)	0.2 - 0.5 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.45 (ap≤1.5mm)	0.2 - 0.6 - 0.9 (ap≤1.0mm) 0.2 - 0.5 - 0.7 (ap≤1.5mm)	0.2 - 0.7 - 1.0		☆ 60 - 100 - 130	★ 60 - 100 - 130	—	—	—
	Austenitic stainless steel	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		★ 100 - 160 - 200	☆ 100 - 160 - 200	—	—	—
	Martensitic stainless steel	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		☆ 150 - 200 - 250	—	—	—	★ 180 - 240 - 300
	Precipitation hardened stainless steel	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		★ 90 - 120 - 150	—	—	—	—
	Gray cast iron	0.5 - 0.8 - 1.0 (ap≤1.0mm) 0.2 - 0.4 - 0.5 (ap≤1.5mm)	0.5 - 1.0 - 1.5 (ap≤1.0mm) 0.3 - 0.7 - 1.0 (ap≤1.5mm)	0.5 - 1.2 - 1.8 (ap≤1.0mm) 0.4 - 1.0 - 1.5 (ap≤1.5mm)	0.5 - 1.5 - 2.0		—	—	★ 120 - 180 - 250	—	—
	Nodular cast iron	0.5 - 0.7 - 0.8 (ap≤1.0mm) 0.2 - 0.3 - 0.4 (ap≤1.5mm)	0.5 - 0.8 - 1.2 (ap≤1.0mm) 0.3 - 0.6 - 0.8 (ap≤1.5mm)	0.5 - 1.0 - 1.6 (ap≤1.0mm) 0.4 - 0.8 - 1.2 (ap≤1.5mm)	0.5 - 1.2 - 1.8		—	—	★ 100 - 150 - 200	—	—
	Ni-base heat-resistant alloy	0.2 - 0.4 - 0.6 (ap≤1.0mm) 0.15 - 0.2 - 0.3 (ap≤1.5mm)	0.2 - 0.5 - 0.9 (ap≤1.0mm) 0.2 - 0.4 - 0.6 (ap≤1.5mm)	0.2 - 0.6 - 1.0 (ap≤1.0mm) 0.2 - 0.5 - 0.8 (ap≤1.5mm)	0.2 - 0.8 - 1.2		☆ 20 - 30 - 50	—	—	—	★ 20 - 30 - 50
	Titanium alloy	0.2 - 0.4 - 0.6 (ap≤1.0mm) 0.15 - 0.2 - 0.3 (ap≤1.5mm)	0.2 - 0.5 - 0.9 (ap≤1.0mm) 0.2 - 0.4 - 0.6 (ap≤1.5mm)	0.2 - 0.6 - 1.0 (ap≤1.0mm) 0.2 - 0.5 - 0.8 (ap≤1.5mm)	0.2 - 0.8 - 1.2		★ 40 - 60 - 80	—	☆ 30 - 50 - 70	—	—

- The figure in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation
- Machining with coolant is recommended for Ni-base heat-resistant alloy and titanium alloy
- Machining with BT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions
- Internal coolant is recommended for slotting applications

Case studies

Construction machine parts S25C



Cutting time

PR1525

950 sec

75%
Cutting time

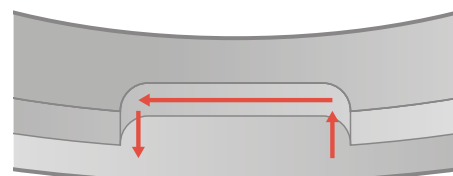
Competitor J (90° Cutter)

3,800 sec

PR1525 features a higher number of passes compared to Competitor J, but the machining time was reduced by 75% because the feed rate can be increased by 7 times.

User evaluation

Clutch SUS304F



Vc = 120 m/min (n = 1,190 min⁻¹), ap x ae = 1.0 x 20 mm
fz = 1.2 mm/t (Vf = 2,850 mm/min), dry
MFH32-S32-10-2T (2 inserts), SOMT100420ER-GM PR1535 (Conventional grade)

Chip evacuation

PR1535

58 cc/min

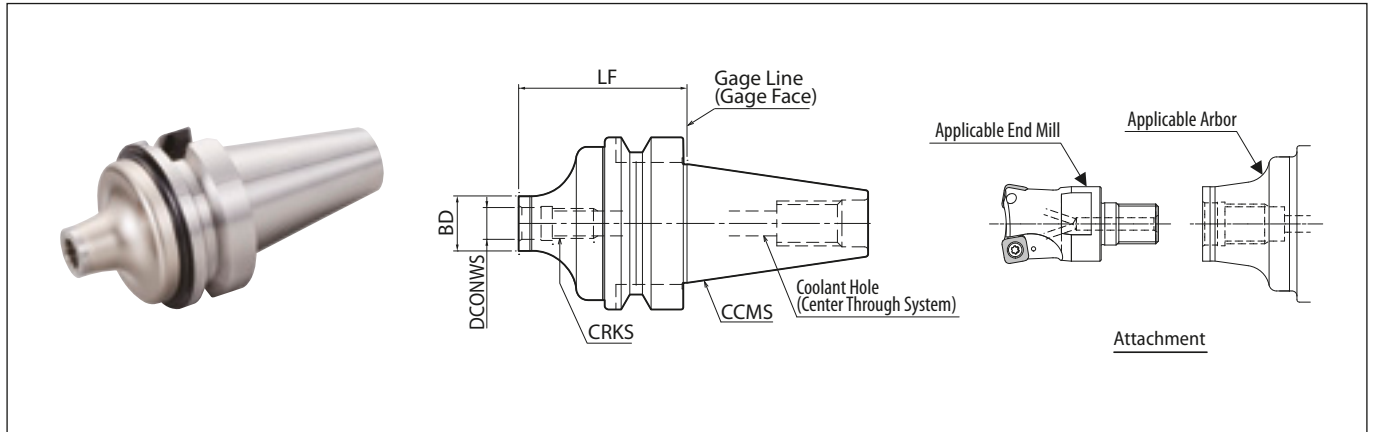
Efficiency
x 1.6

Competitor K

36 cc/min

PR1535 shows stable machining while Competitor K generated chattering. PR1535 maintained a good cutting edge condition with stable machining.

User evaluation



Dimensions

Description	Availability	Dimensions (mm)				Coolant hole	Arbor Two-face clamping	Applicable end mill (Head)
		LF	BD	DCONWS	CRKS			
BT30K- M08-45	●	45	14.7	8.5	M8×P1.25	Yes	BT30	MFH...M08-..
M10-45	●	45	18.7	10.5	M10×P1.5			MFH...M10-..
M12-45	●	45	23	12.5	M12×P1.75			MFH...M12-..
BT40K- M08-55	●	55	14.7	8.5	M8×P1.25	Yes	BT40	MFH...M08-..
M10-60	●	60	18.7	10.5	M10×P1.5			MFH...M10-..
M12-55	●	55	23	12.5	M12×P1.75			MFH...M12-..
M16-65	●	65	30	17	M16×P2.0			MFH...M16-..

● : Available

Effective depth of assembled tool

Arbor description	Applicable screw on type			Effective depth of assembled tool (mm)
	Description	Cutting dia. (mm)	Dimensions (mm)	
		DC	LF	LUX
BT30K- M08-45	MFH16-M08-01...	16	22	28.8
	MFH16-M08-03...	16	25	31.8
	MFH17-M08-03...	17	25	33.2
	MFH18-M08-03...	18	25	34.2
	MFH20-M10-03...	20	30	36.8
	MFH22-M10-03...	22	30	39.2
M10-45	MFH25-M12-..	25	35	42.8
	MFH28-M12-..	28	35	45.5
M12-45	MFH16-M08-01...	16	22	28.7
	MFH16-M08-03...	16	25	31.7
	MFH17-M08-03...	17	25	33.2
	MFH18-M08-03...	18	25	34.3
BT40K- M08-55	MFH20-M10-03...	20	30	38.7
	MFH22-M10-03...	22	30	44.5
M10-60	MFH25-M12-..	25	35	44.6
	MFH28-M12-..	28	35	47.6
M12-55	MFH32-M16-..	32	40	51.2
	MFH35-M16-10...	35	40	60.2
M16-65	MFH40-M16-10...	40	40	64

Arbor identification system

BT30	K	-M12-	45
Arbor size	Two-Face clamping spindle	Thread size for clamping	Length from the gage

Approximate programming radius adjustment



MFH Micro			MFH Mini		
Programmable R. (mm)	Maximum over machining of radius (mm)	Maximum no machined portion (mm)	Programmable R. (mm)	Maximum over machining of radius (mm)	Maximum no machined portion (mm)
R1.0	0	0.21	R1.6 (Recommended)	0	0.39
R1.2 (Recommended)	0	0.17	R2.0	0.09	0.35
R1.5	0.08	0.1	R2.5	0.26	0.26
R2.0	0.28	0.01	R3.0	0.46	0.17

*Cutting edge Angle for MFH Micro/MFH Mini is 12° Workpiece side wall Max. inclination angle is 90°

MFH Harrier (GM - GH)						
Description	Insert	Cutting edge angle γ	Programmable R. (mm) (Recommended)	Maximum over machining of radius (mm)	Maximum no machined portion (mm)	Workpiece side wall max. Inclination angle
MFH...-10-...	GM • GH	10°	R3.0	0	0.85	90°
	LD	14°	R3.5	0	0.69	65°
	FL	14°	R3.0	0	0.89	80°
MFH...-14-...	GM • GH	10°	R3.5	0	1.37	90°
	LD	16°	R5.0	0	1.06	65°
	FL	13°	R3.0	0	1.36	80°

Ramping reference data

Description	Cutting dia. DCX (mm)	8	10	12	14	16
MFH Micro	Max. ramping angle RMPX	4°	3°	2°	1.5°	1.2°
	tan RMPX	0.070	0.052	0.035	0.026	0.021

Description	Cutting dia. DCX (mm)	16	17	18	20	22	25	28	32	40	50
MFH Mini	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	0.030	0.024	0.021	0.017	0.014	0.009	0.007

Description	Cutting dia. DCX (mm)	25	28	32	35	40	50	63	80
MFH Harrier (MFH...-10-...)	Max. ramping angle RMPX	5°	4.5°	4°	3.5°	3°	2.5°	2°	1°
	tan RMPX	0.087	0.078	0.070	0.061	0.052	0.043	0.035	0.017

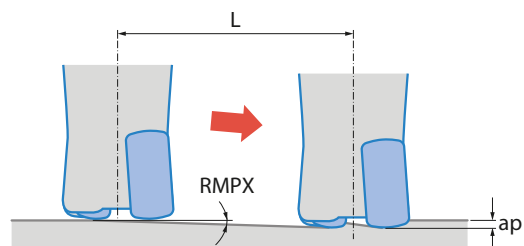
Description	Cutting dia. DCX (mm)	50	63	80	100	125	160
MFH Harrier (MFH...-14-...)	Max. ramping angle RMPX	2°	1.8°	1°	0.5°	0.4°	0.2°
	tan RMPX	0.035	0.031	0.017	0.009	0.007	0.003

Ramping

Ramping angle should be under RMPX (maximum ramping angle) in the above cutting conditions. Reduce recommended feed rate in cutting conditions above by 70%.

Formula for max. cutting length (L) at max. ramping angle

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

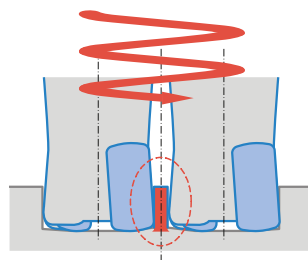


Helical milling

For helical milling, use between minimum and maximum cutting diameter.

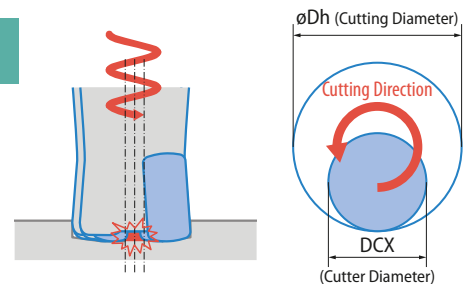
Exceeding max. machining dia.

Center core remains after machining



Under min. machining dia.

Center core hits holder body

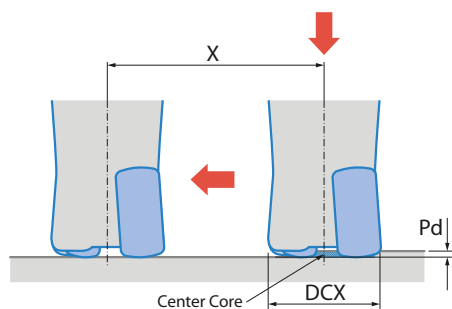


Description	Min. Cutting dia. øDh1	Max. Cutting dia. øDh2	Maximum ramping depth per cycle
MFH Micro	2 × DCX-3.5	2 × DCX-2	0.5 mm
MFH Mini	2 × DCX-8	2 × DCX-2	1 mm
MFH Harrier (MFH...-10-...)	2 × DCX-18	2 × DCX-2	GM = 1.5 mm
MFH Harrier (MFH...-14-...)	2 × DCX-25	2 × DCX-2	GM = 2 mm

Use climb milling. (Refer to detail on right)

Feed rates should be reduced to 50% of recommended cutting conditions. Use caution to eliminate incidences caused by producing long chips.

Peck milling



Description	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MFH Micro	0.5	DCX-3.5
MFH Mini	1.0	DCX-9

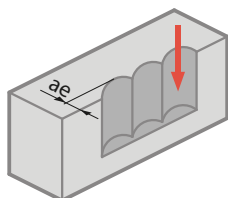
Unit: mm

Description	GM • GH		LD		FL	
	Max. cutting depth Pd	Min. cutting length X for flat bottom surface	Max. cutting depth Pd	Min. cutting length X for flat bottom surface	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MFH Harrier (MFH...-10-...)	1.5	DCX-18	1.5	DCX-14	1.5	DCX-15
MFH Harrier (MFH...-14-...)	2.0	DCX-24	2.0	DCX-18	2.0	DCX-19

It is recommended to reduce feed by 25% of recommendation until the center core is removed.

Axial feed rate recommendation per revolution is $f < 0.2\text{mm/rev}$.

Plunging



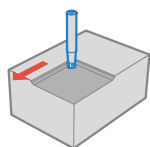
LD and FL chipbreakers are not available for plunging.
Reduce feed rate to $f_z \leq 0.2\text{mm/t}$ when plunging.

Unit: mm

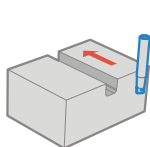
Description	Maximum width of cut (ae)
MFH Micro	1.7
MFH Mini	3.5
MFH Harrier (MFH...-10-...)	8 (GM • GH)
MFH Harrier (MFH...-14-...)	11.5 (GM • GH)

3D machining | MFH Harrier

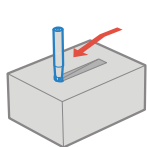
GM and GH chipbreakers are available for all the applications.



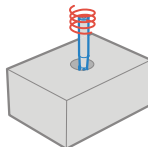
Face milling & shouldering



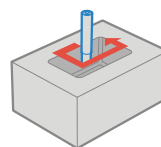
Slotting



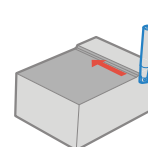
Ramping



Helical milling



Pocketing



Contouring

Rising Wall Angle

For using MFH Harrier

Insert	Ramping	Contouring (Rising wall angle)	Plunging	Helical milling	Pocketing
GM • GH	○	○ (90°)	○	○	○
LD	○	△ (65°)	×	×	×
FL	○	△ (80°)	×	×	×

*For FL and LD Type, there is a limit of rising wall angle during contouring

