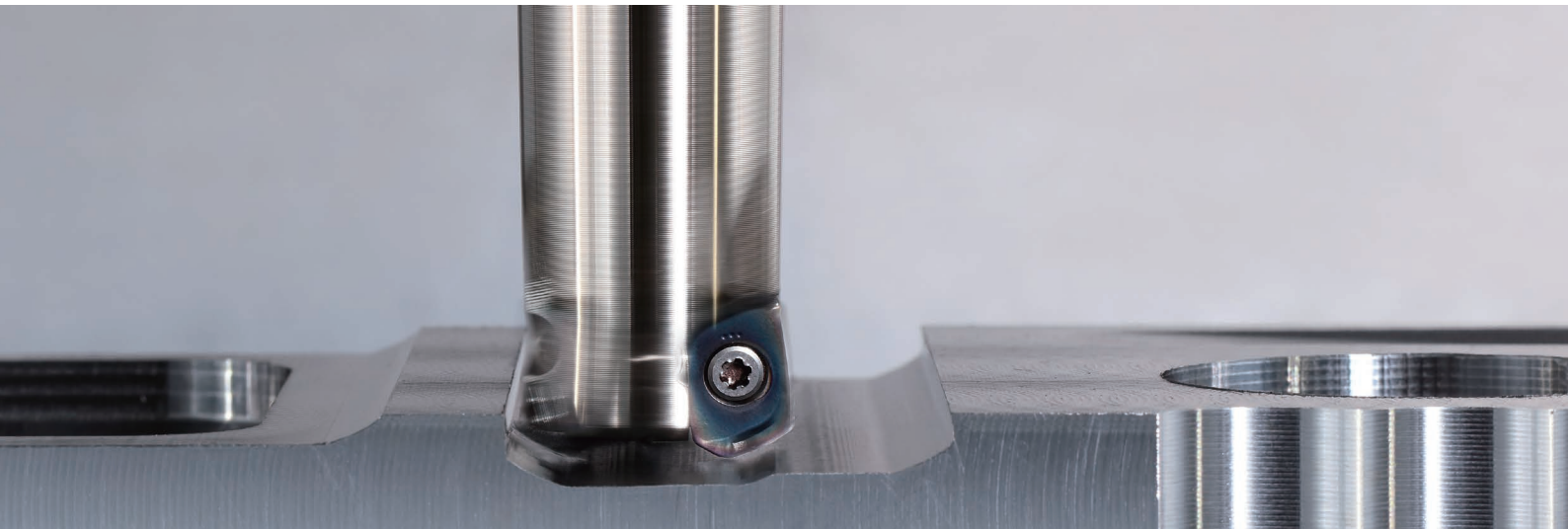


# MFH Boost



**High feed milling with larger depths of cut**

High feed end mills with cutting dia. available from  $\varnothing$  22 and up to 2.5 mm depth of cut

Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials, and molds



High feed and large depth of cut milling

# MFH Boost

New addition to the MFH Series - High feed plus large D.O.C. for greater milling capabilities  
Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials, and molds

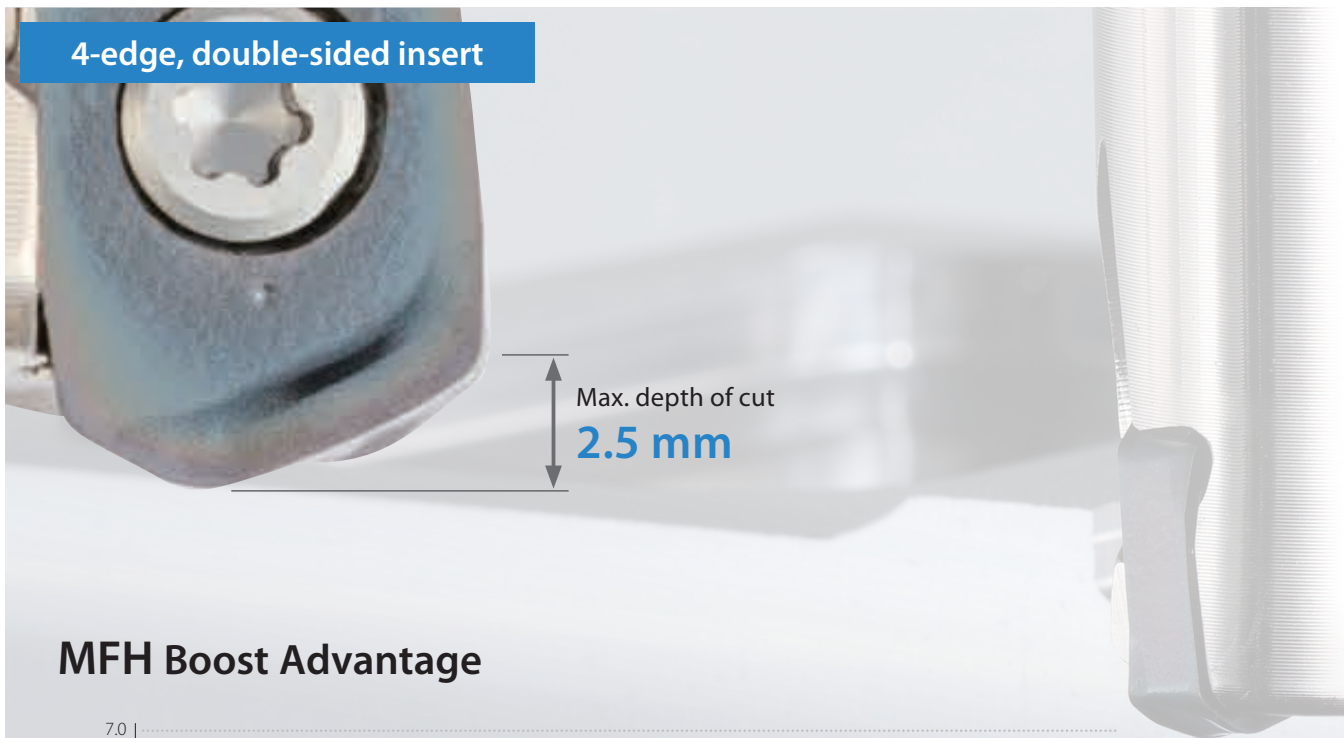
Video



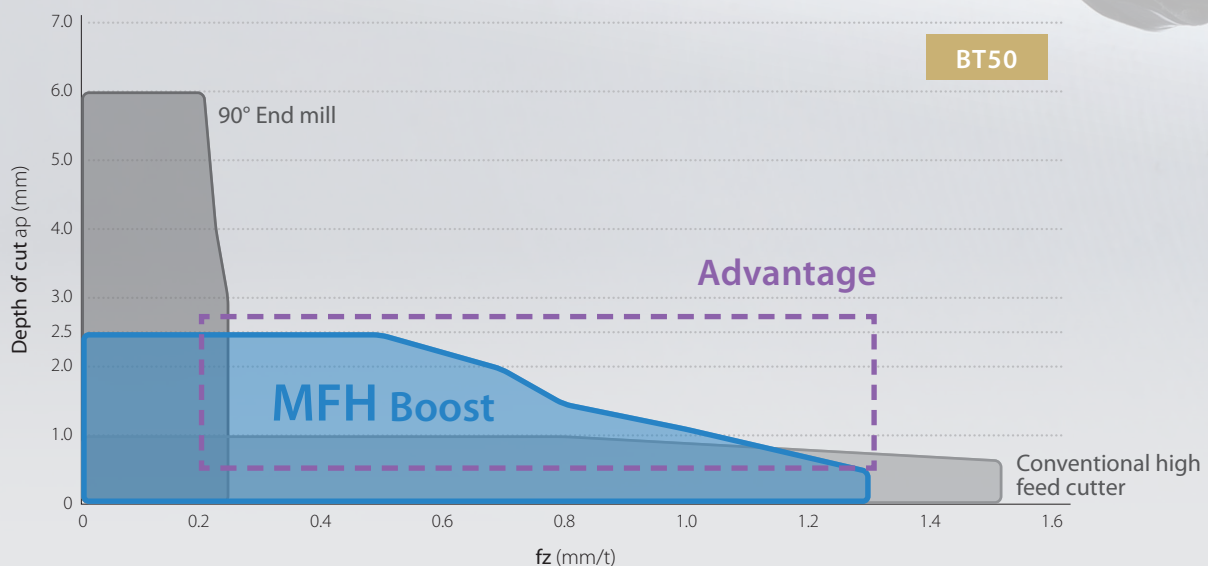
## 1 High feed milling with large depth of cut capabilities

A small 04 size insert (4-edge, double-sided insert) supports depths of cut up to 2.5 mm with cutting dia. available from  $\varnothing 22$  mm.

Achieves high efficiency machining in various shouldering, slotting, helical milling, and ramping applications.



## MFH Boost Advantage



$V_c = 150$  m/min,  $a_e = 12.5$  mm ( $a_e/DCX = 50\%$ ), C50, dry,  $\varnothing 25$ , overhang length 60 mm, BT50

## New value with 2.5 mm max. depth of cut

- 1** Provides a better alternative to conventional 90° end mills  
(Roughing to medium-finishing)



Automotive suspension parts

### Automotive parts

General steel machining

- Increased productivity with large D.O.C. machining
- High reliability in unstable machining environments  
Long overhang length and better clamping rigidity  
Stable machining with low rigidity machines
- High-efficiency ramping  
Large ramping angle (Small dia.  $\varnothing 25\text{mm}$ : 3°)  
Dramatic efficiency improvement when ramping in pockets
- Longer tool life with high-efficiency machining

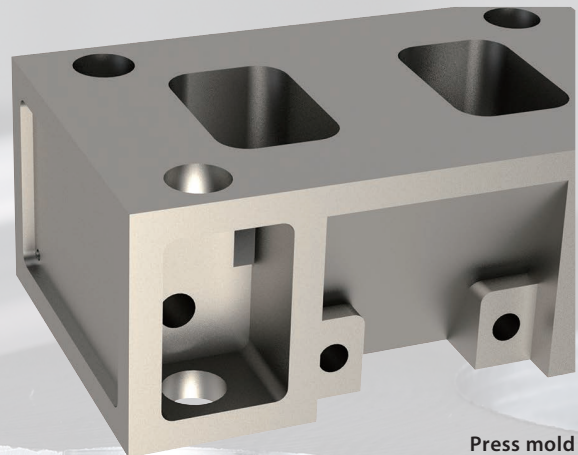
- 2** Provides a greater solution than conventional high feed cutters

### General parts/mold (High roughing/facing)

General parts, pressing and die casting

- Higher productivity with large D.O.C.
- Long tool life and improved efficiency through the reduction of tool paths  
Reduced machining time when machining workpieces with large variations in machining margins
- Longer tool life with high-efficiency machining

\*MFH Mini/Harrier recommended for contouring with small depth of cut and high feed



Press mold

- 3** Solutions for machining difficult-to-cut materials



Aircraft landing gear parts

### Aircraft/energy industry parts

Difficult-to-cut materials such as titanium alloy and stainless steel machining

- High feed rates increase productivity
- Long tool life through the reduction of tool paths
- Good combination with heat-resistant grade PR1535 provides long tool life and stable machining

## 2

# Available for a variety of machining applications and environments

## 1 Solutions for 90° end mills (Rough to medium-finish machining)

### High feed rates dramatically improve machining efficiency

#### Machining efficiency simulation example

Pocketing:  $V_c = 150$  m/min,  $a_e = 12.5$  mm

**MFH Boost**  
ø 25 (3 Inserts)

**100 cc/min**

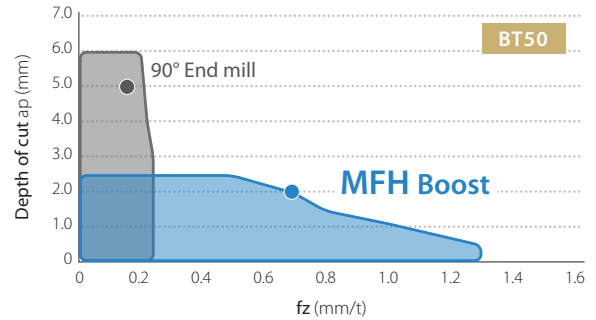
$a_p = 2.0$  mm,  $f_z = 0.7$  mm/t

Machining efficiency  
↑  
**x 1.8**

Conventional  
90° end mill  
ø 25 (3 Inserts)

**54 cc/min**

$a_p = 5.0$  mm,  $f_z = 0.15$  mm/t



### High efficiency and good tool life

#### Machining efficiency and cutting edge condition comparison (Internal evaluation)

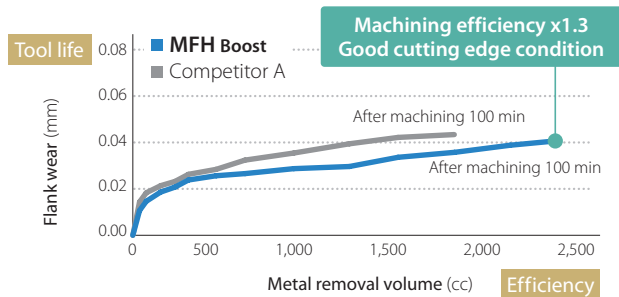
##### Cutting edge condition after 100 min machining

**MFH Boost**

$a_p = 1.6$  mm,  $f_z = 0.6$  mm/t

Competitor A 90° end mill

$a_p = 5.0$  mm,  $f_z = 0.15$  mm/t



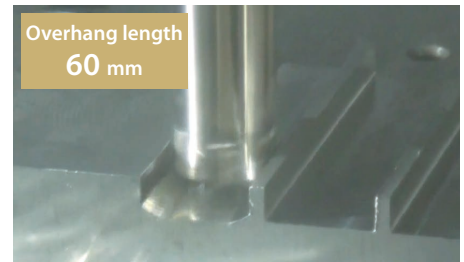
$V_c = 150$  m/min,  $a_e = 12.5$  mm, dry, 42CrMo4, ø 25 (1 Insert) BT50

### High stability in unstable machining environment

#### Chatter resistance comparison (Internal evaluation)

##### Slotting

ø 25 (3 Inserts)  
External air  
C50  
BT50



##### Video



#### Machining efficiency

**MFH Boost**

**103 cc/min**

$V_c = 120$  m/min,  $a_p = 1.5$  mm,  $f_z = 0.6$  mm/t

Machining efficiency  
↑  
**x 4.5**

Competitor A  
90° End Mill

**31 cc/min**

**Chattering (Machining was impossible)**

$V_c = 80$  m/min,  $a_p = 2$  mm,  $f_z = 0.2$  mm/t

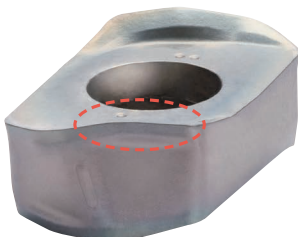
**23 cc/min**

$V_c = 80$  m/min,  $a_p = 2$  mm,  $f_z = 0.15$  mm/t

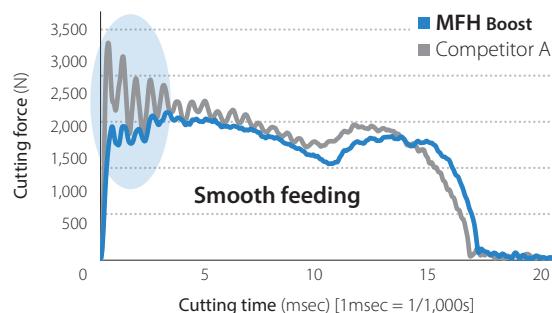
### High efficiency and stable machining designs

#### Kyocera's original technology

#### Convex cutting edge design reduces impact when entering workpiece



#### Cutting force when entering workpiece (Internal evaluation)



$V_c = 150$  m/min,  $a_p = 2.0$  mm,  $a_e = 25$  mm,  $f_z = 0.7$  mm/t, dry, C50, ø 50 (1 Insert), BT50

## 2 Better solution than conventional high feed cutters

### Large D.O.C. dramatically improves machining efficiency

#### Machining efficiency simulation example

Multistage machining (Depth 30 mm):  $V_c = 150$  m/min,  $a_e = 12.5$  mm

**MFH Boost**  
ø 25 (3 Inserts)

**100 cc/min**

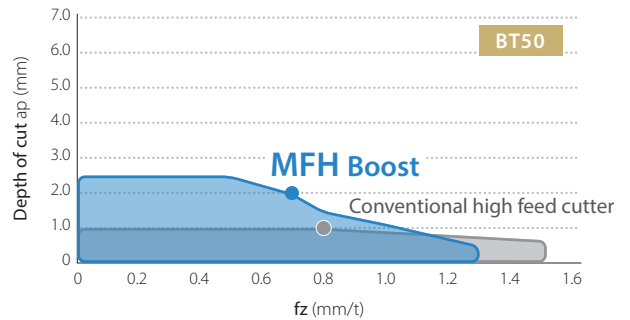
$a_p = 2.0$  mm,  $f_z = 0.7$  mm/t

Machining efficiency  
x 1.3

Conventional high feed cutter  
ø 25 (3 Inserts)

**76 cc/min**

$a_p = 1.0$  mm,  $f_z = 0.8$  mm/t



### High efficiency and good tool life

#### Machining efficiency and cutting edge condition comparison (Internal evaluation)

##### Cutting edge condition after 100 min machining

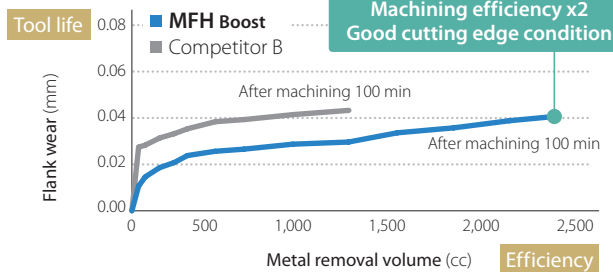
**MFH Boost**

$a_p = 1.6$  mm,  $f_z = 0.6$  mm/t



Competitor B High feed type

$a_p = 0.8$  mm,  $f_z = 0.6$  mm/t



$V_c = 150$  m/min,  $a_e = 12.5$  mm, dry, 42CrMo4, ø 25 (1 Insert), BT50

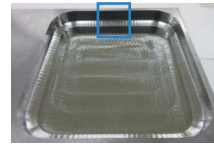
### Excellent wall accuracy

#### Machining efficiency and wall accuracy comparison (Internal evaluation)

Pocketing (Depth 12mm)

**MFH Boost**

ø 25 (3 Inserts)



$a_p = 1.5$  mm × 8 passes  
 $Q = 115$  cc/min

Cutting conditions:  $V_c = 200$  m/min,  $a_e = 12.5$  mm,  $f_z = 0.8$  mm/t, dry, C50, BT50

Competitor B High feed type  
ø 25 (4 Inserts)



$a_p = 0.8$  mm × 15 passes  
 $Q = 81$  cc/min



### Superior wall accuracy



Wiper on outer periphery

Reduction of wall level variation in multi-pass machining

## 3 Solutions for machining difficult-to-cut materials

### Dramatic improvement in machining efficiency with titanium alloy, stainless steel machining, etc.

#### Machining efficiency comparison (Internal evaluation)

Titanium alloy pocketing (Depth 6 mm)

**MFH Boost**

**Approx. 1' 30"**

$a_p = 1.5$  mm × 4 passes ( $f_z = \sim 0.35$  mm/t)

Machining efficiency  
x 1.8

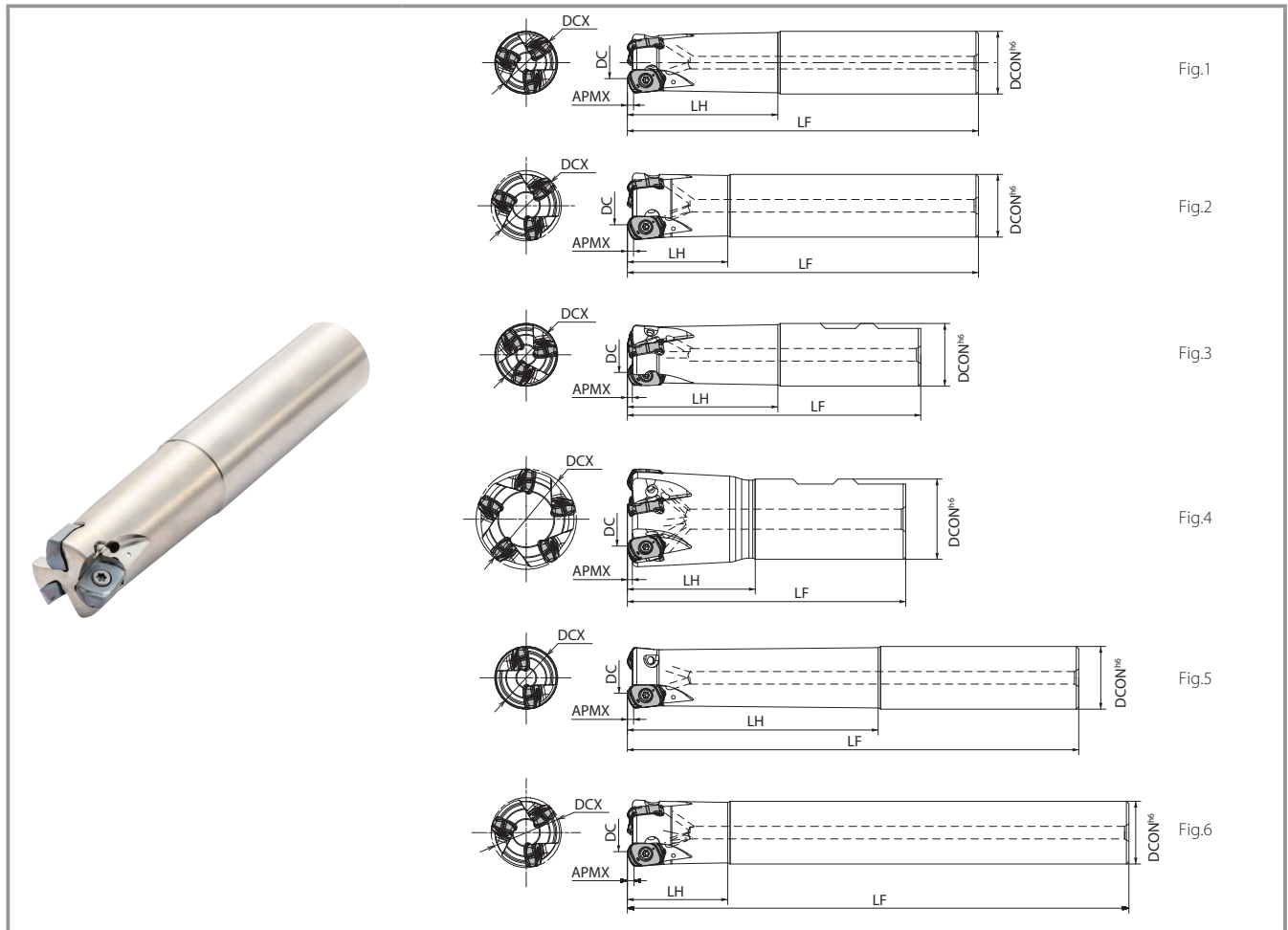
Competitor C  
High feed type

**Approx. 2' 50"**

$a_p = 0.6$  mm × 10 passes ( $f_z = \sim 0.4$  mm/t)

$V_c = 50$  m/min,  $a_e = 12.5$  mm ( $a_e/DCX = 50\%$ ), Ramping angle  $3^\circ$ , Ti-6Al-4V, wet, ø 25 (3 Inserts), BT50





Toolholder dimensions

Shank	Description	Availability	No. of inserts	Dimensions (mm)						Rake angle		Coolant hole	Shape	Weight (kg)	Max. revolution (min <sup>-1</sup> )
				DCX	DC	DCON	LH	LF	APMX	A.R.					
Standard (Straight)	MFH 25-S25-04-2T	●	2	25	14	25	60	140	2.5	-10°	Yes	Fig.1	0.5	12,700	
	25-S25-04-3T	●	3										0.5		
	32-S32-04-4T	●	4	32	21	32	70	150					0.8		
	32-S32-04-5T	●	5										0.8		
Over Size (Straight)	MFH 22-S20-04-2T	●	2	22	11	20	30	130	2.5	-10°	Yes	Fig.2	0.3	13,600	
	28-S25-04-3T	●	3	28	17	25	40	140					0.5		
	28-S25-04-4T	●	4										35	24	32
	35-S32-04-4T	●	4	35	24	32	50	150							
	35-S32-04-5T	●	5										40	29	32
	40-S32-04-5T	●	5	40	29	32	50	150							
	40-S32-04-6T	●	6										40	29	32
Standard (Weldon)	MFH 25-W25-04-2T	●	2	25	14	25	60	117	2.5	-10°	Yes	Fig.3			
	25-W25-04-3T	●	3										0.4		
	32-W32-04-4T	●	4	32	21	32	70	131					0.7		
	32-W32-04-5T	●	5										0.7		
	40-W32-04-5T	●	5	40	29	32	50	111					0.7		
	40-W32-04-6T	●	6										0.7		
Long Shank (Straight)	MFH 25-S25-04-2T-180	●	2	25	14	25	100	180	2.5	-10°	Yes	Fig.5	0.6	12,700	
	25-S25-04-3T-180	●	3										0.6		
	28-S25-04-3T-200	●	3	28	17	25	40	200					0.7		
	32-S32-04-4T-200	●	4	32	21	32	120	200					1.1		
	35-S32-04-4T-200	●	4	35	24	32	50	250					1.1		
	40-S32-04-5T-250	●	5	40	29	32	50	250					1.5		

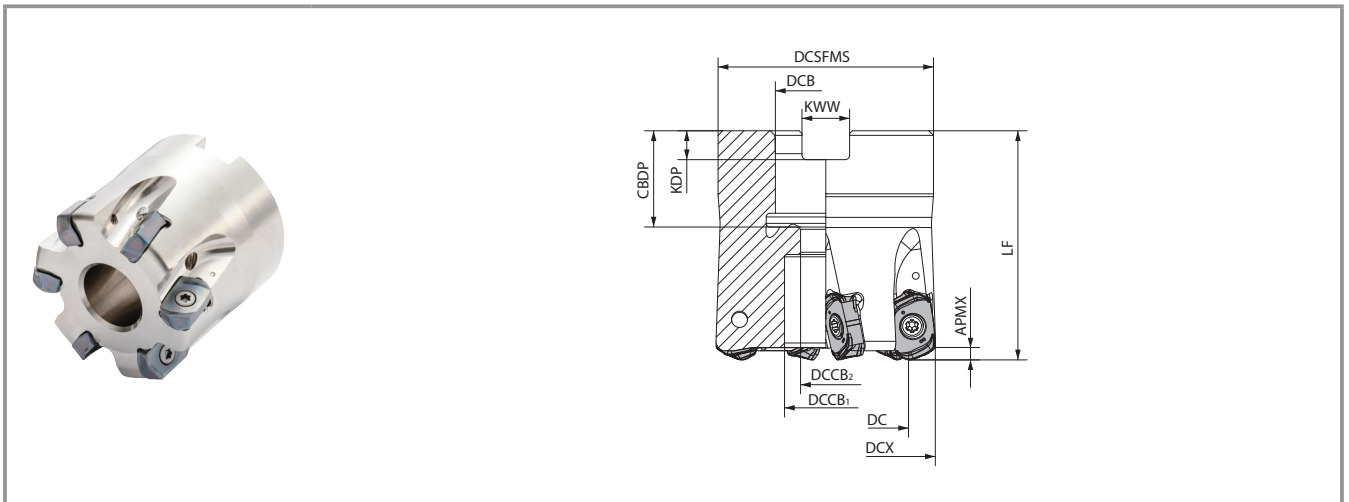
Caution with max. revolution

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

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 Boost Face mill



## Toolholder dimensions

Description	Availability	No. of inserts	Dimensions (mm)										Rake angle	Coolant hole	Weight (kg)	Max. revolution (min <sup>-1</sup> )	
			DCX	DC	DCSFMS	DCB	DCCB <sub>1</sub>	DCCB <sub>2</sub>	LF	CBDP	KDP	KWW	APMX				A.R.
MFH 040R-04-5T-M	●	5	40	29	38	16	15	9	40	19	5.6	8.4	2.5	-10°	Yes	0.2	10,000
040R-04-6T-M	●	6														0.2	
050R-04-6T-M	●	7	50	39	47	22	18	11	50	21	6.3	10.4	2.5	-10°		0.4	9,000
050R-04-7T-M	●															0.4	
052R-04-6T-M	●	6	52	41	47	22	18	11	50	21	6.3	10.4	2.5	-10°		0.5	8,800
052R-04-7T-M	●	7														0.4	
063R-04-7T-M	●	9	63	52	60	27	20	13	63	24	7.0	12.4	2.5	-10°		0.8	8,000
063R-04-9T-M	●															0.8	
063R-04-7T-27M	●	7	0.8														
063R-04-9T-27M	●	9	0.7														
080R-04-8T-M	●	8	80	69	76	27	20	13	63	24	7.0	12.4	2.5	-10°	1.8	7,100	
080R-04-10T-M	●	10													1.7		




Caution with max. revolution

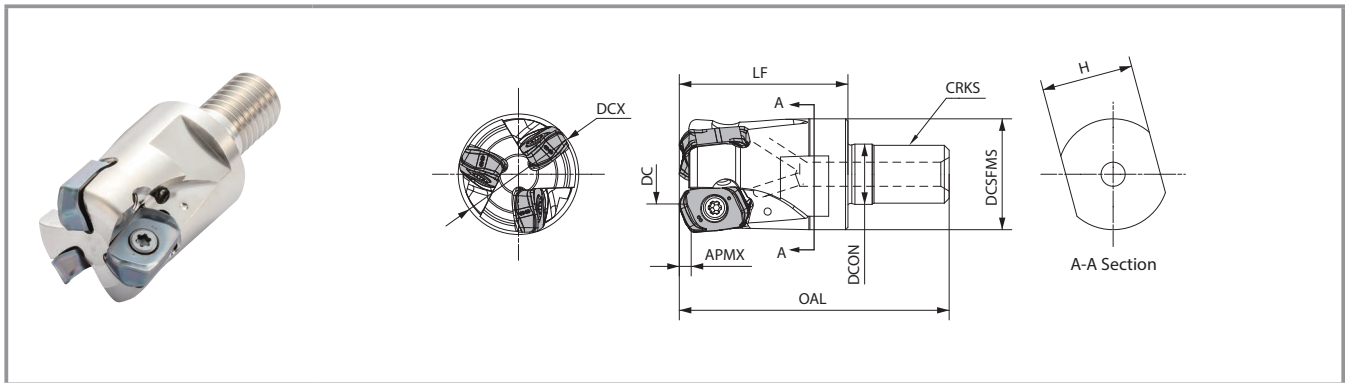
Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on back cover.

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

## Parts

Description	Parts		
	Clamp screw	Wrench	Anti-seize compound
			
MFH ...-04...	SB-3575TRP	DTPM-10	P-37
Recommended torque for insert clamp 2.0N·m			



Toolholder dimensions

Description	Availability	No. of inserts	Dimensions (mm)								Rake angle		Coolant hole	Max. revolution (min <sup>-1</sup> )								
			DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R.										
MFH 22-M10-04-2T	●	2	22	11	18.7	10.5	48	30	M10XP1.5	15	2.5	-10°	Yes	13,600								
25-M12-04-2T	●		25	14	23	12.5	56	35	M12XP1.75	19				12,700								
25-M12-04-3T	●	3	28	17										30	17	62	40	M16XP2.0	24	12,000		
28-M12-04-3T	●				4	32	21	40	29	42										31	5	9,800
28-M12-04-4T	●																					
32-M16-04-4T	●	4	32	21	40	29	42	31	5	9,800												
32-M16-04-5T	●													5	35	24	40	29	42	31	5	9,800
35-M16-04-4T	●	6	40	29	42	31	5	9,800	9,800													
35-M16-04-5T	●									5				40	29	42	31	5	9,800	9,800		
40-M16-04-5T	●	6	40	29	42	31	5	9,800	9,800													
40-M16-04-6T	●									5				42	31	5	9,800	9,800	9,800			
42-M16-04-5T	●	6	42	31	5	9,800	9,800	9,800														
42-M16-04-6T	●								6	42	31	5	9,800	9,800	9,800							

Caution with max. revolution  
 Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on back cover.  
 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

Applicable inserts

Shape	Description	Dimensions (mm)					MEGACOAT NANO			CVD Coating
		W1	S	D1	INSL	RE	PR1535	PR1525	PR1510	CA6535
<p>4-edge, Double-sided insert</p>	LOMU 040410ER-GM	9.1	4.4	4.1	14.5	1.0	●	●	●	●

●: Available

Insert grade:

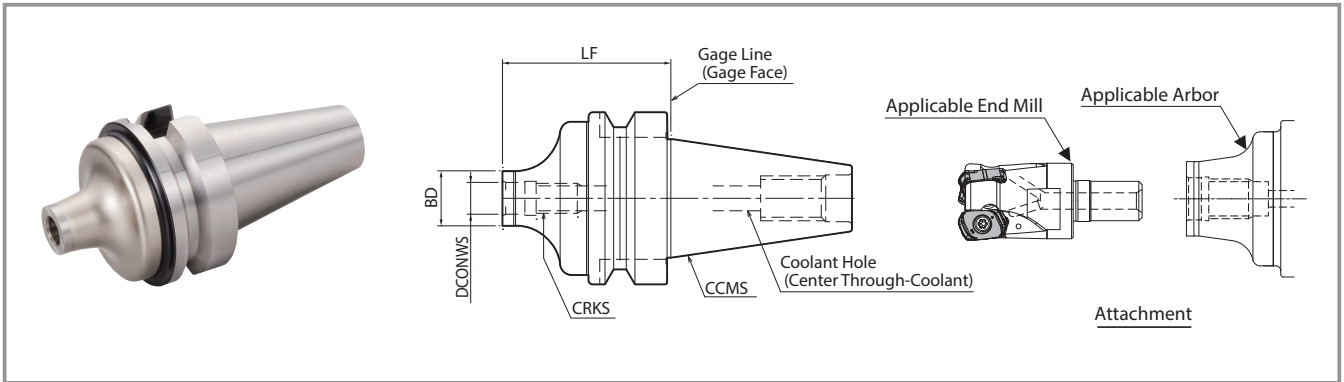
**PR1535** For steel machining (Stable machining oriented), titanium alloy, austenitic/precipitation hardening stainless steel, etc.

**PR1525** For steel machining (General use)

**PR1510** For cast iron machining

**CA6535** For martensitic stainless steel, Ni-base heat resistant alloy, etc.

# BT Arbor (for exchangeable head/two face contact)



## Dimension

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

● : Available

## Actual end mill depth

Arbor description	Applicable end mill (Head)			Actual end mill depth(mm)
	Description	Cutting dia.(mm)	Dimension(mm)	LUX
			DC	
BT30K- M10-45	MFH22-M10...	22	30	39.2
	MFH25-M12...	25	35	42.8
	MFH28-M12...	28	35	45.5
BT40K- M10-60	MFH22-M10...	22	30	44.5
	MFH25-M12...	25	35	44.6
	MFH28-M12...	28	35	47.6
M16-65	MFH32-M16...	32	40	51.2
	MFH35-M16...	35	40	60.2
	MFH40-M16...	40	40	64.0
	MFH42-M16...	42	40	64.0

## MFH Series Large lineup for various applications and machining environments

Small diameter/  
Large depth of cut



Micro diameter



**MFH Micro**  
ø8 ~ ø16

Small diameter/  
Fine pitch type

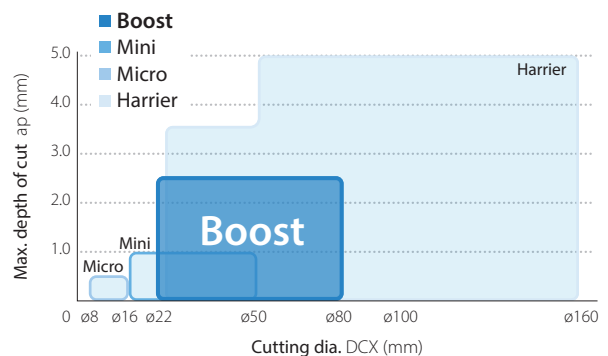


**MFH Mini**  
ø16 ~ ø50

Large diameter



**MFH Harrier**  
ø25 ~ ø160



## Recommended cutting conditions ★ 1st recommendation ☆ 2nd recommendation

Chipbreaker	Workpiece	Toolholder description and feed (fz: mm/t)		Recommended insert grade (Vc: m/min)			
		ap(mm)	MFH...04...	MEGACOAT NANO			CVD Coating
				PR1535	PR1525	PR1510	CA6535
GM	Carbon steel (~ 280HB)	≤ 0.5	0.20 - 0.80 - 1.30	120 - <b>160</b> - 220	<b>★</b> 120 - <b>160</b> - 220	-	-
		≤ 1.0	0.20 - 0.70 - 1.10				
		≤ 1.5	0.20 - 0.60 - 0.80				
		≤ 2.0	0.20 - 0.40 - 0.70				
		≤ 2.5	0.20 - 0.30 - 0.50				
	Alloy steel (~ 350HB)	≤ 0.5	0.20 - 0.75 - 1.20	100 - <b>150</b> - 200 (Dry machining recommended)	<b>★</b> 100 - <b>150</b> - 200 (Dry machining recommended)	-	-
		≤ 1.0	0.20 - 0.65 - 1.00				
		≤ 1.5	0.20 - 0.55 - 0.70				
		≤ 2.0	0.20 - 0.40 - 0.55				
		≤ 2.5	0.20 - 0.25 - 0.35				
	Mold steel (~ 40HRC)	≤ 0.5	0.20 - 0.60 - 1.10	80 - <b>120</b> - 160 (Dry machining recommended)	<b>★</b> 80 - <b>120</b> - 160 (Dry machining recommended)	-	-
		≤ 1.0	0.20 - 0.50 - 0.90				
		≤ 1.5	0.20 - 0.40 - 0.65				
		≤ 2.0	0.20 - 0.30 - 0.55				
		≤ 2.5	0.20 - 0.25 - 0.35				
	Mold steel (40 ~ 50HRC)	≤ 0.5	0.10 - 0.30 - 0.50	-	<b>★</b> 60 - <b>100</b> - 130 (Dry machining recommended)	-	-
		≤ 1.0	0.10 - 0.25 - 0.40				
		≤ 1.5	0.10 - 0.20 - 0.30				
		≤ 2.0	-				
		≤ 2.5	-				
	Mold steel (50 ~ 55HRC)	≤ 0.5	0.10 - 0.20 - 0.40	-	<b>★</b> 50 - <b>70</b> - 100 (Dry machining recommended)	-	-
		≤ 1.0	0.10 - 0.15 - 0.25				
		≤ 1.5	-				
		≤ 2.0	-				
		≤ 2.5	-				
	Austenitic stainless steel	≤ 0.5	0.20 - 0.60 - 1.00	100 - <b>140</b> - 180	100 - <b>140</b> - 180	-	-
		≤ 1.0	0.20 - 0.50 - 0.90				
		≤ 1.5	0.20 - 0.45 - 0.60				
		≤ 2.0	0.20 - 0.30 - 0.50				
		≤ 2.5	0.20 - 0.25 - 0.40				
	Martensitic stainless steel	≤ 0.5	0.20 - 0.60 - 1.00	100 - <b>150</b> - 200	-	-	<b>★</b> 150 - <b>200</b> - 300
		≤ 1.0	0.20 - 0.50 - 0.90				
		≤ 1.5	0.20 - 0.45 - 0.60				
		≤ 2.0	0.20 - 0.30 - 0.50				
		≤ 2.5	0.20 - 0.25 - 0.40				
	Precipitation hardened stainless steel	≤ 0.5	0.10 - 0.30 - 0.50	90 - <b>120</b> - 150	-	-	-
		≤ 1.0	0.10 - 0.25 - 0.45				
		≤ 1.5	0.10 - 0.15 - 0.25				
		≤ 2.0	-				
		≤ 2.5	-				
Gray cast iron	≤ 0.5	0.20 - 0.80 - 1.30	-	-	<b>★</b> 120 - <b>160</b> - 220	-	
	≤ 1.0	0.20 - 0.70 - 1.10					
	≤ 1.5	0.20 - 0.60 - 0.80					
	≤ 2.0	0.20 - 0.40 - 0.70					
	≤ 2.5	0.20 - 0.30 - 0.50					
Nodular cast iron	≤ 0.5	0.20 - 0.60 - 1.00	-	-	<b>★</b> 100 - <b>150</b> - 200	-	
	≤ 1.0	0.20 - 0.50 - 0.90					
	≤ 1.5	0.20 - 0.40 - 0.70					
	≤ 2.0	0.20 - 0.30 - 0.60					
	≤ 2.5	0.20 - 0.25 - 0.40					
Ni-base heat-resistant alloy	≤ 0.5	0.10 - 0.30 - 0.45	20 - <b>30</b> - 50	-	-	<b>★</b> 20 - <b>30</b> - 50	
	≤ 1.0	0.10 - 0.25 - 0.40					
	≤ 1.5	0.10 - 0.15 - 0.20					
	≤ 2.0	-					
	≤ 2.5	-					
Titanium alloy	≤ 0.5	0.10 - 0.30 - 0.50	<b>★</b> 40 - <b>60</b> - 80	-	-	-	
	≤ 1.0	0.10 - 0.25 - 0.45					
	≤ 1.5	0.10 - 0.15 - 0.25					
	≤ 2.0	-					
	≤ 2.5	-					

- 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 precipitation hardened stainless steel, Ni-base heat-resistant alloy and titanium alloy.
- Wet machining may have a lower tool life than dry machining. Set the cutting speed, feed rate and D.O.C. lower than recommended conditions.
- Machining with BT30 or equivalent, feed rate should be reduced to 80% or less of recommended cutting conditions. Slotting is not recommended.
- Center through air is recommended for slotting.
- Slotting or pocketing are not recommended for face mill type.
- For face mill type cutters, it is recommended that width of cut should be set to 75% or less of the cutting diameter.
- It is recommended to set the long shank to 75% or less of the recommended conditions for both ap and feed.

## Precautions

### Approximate programming radius adjustment

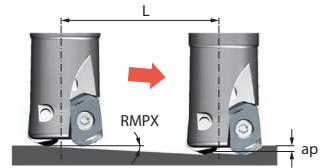
Shape	Programmable R (mm)	Over machined radius portion (mm)	Non-machined portion (mm)
	1.5	0	1.42
	2.0	0	1.24
	3.0 (Recommended)	0	0.87
	3.5	0.06	0.69

### Ramping tips

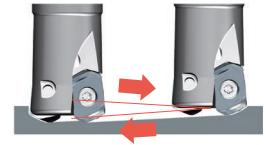
- Ramping angle should be under RMPX
- Reduce recommended feed rate in cutting conditions above by 70%

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

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



- When ramping both forth and back direction alternately, set the maximum ramping angle RMPX to 50%.



### Ramping reference table

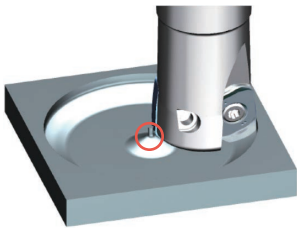
Description	Cutter dia. DCX (mm)	22	25	28	32	35	40	42	50	52	63	80
MFH...-04-...	Max. ramping angle RMPX	3.9°	3.0°	2.4°	2.0°	1.7°	1.4°	1.3°	1.0°	1.0°	0.8°	0.6°
	tan RMPX	0.068	0.052	0.042	0.035	0.029	0.024	0.022	0.018	0.017	0.013	0.010

### Helical milling tips

- For helical milling, use between min. cutting dia. and max. cutting dia.

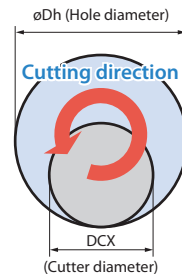
#### Exceeding max. machining dia.

Center core remains after machining



#### Under min. machining dia.

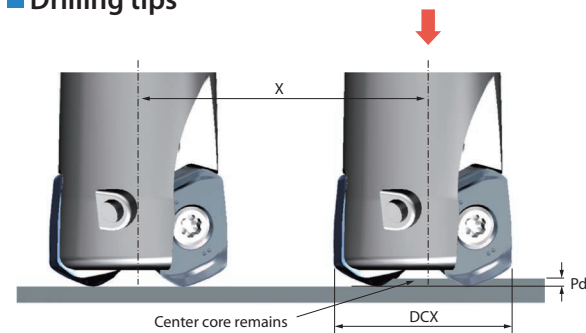
Center core hits holder body



Description	Min. cutting dia. (mm)	Max. cutting dia. (mm)
MFH...-04-...	2×DCX-11	2×DCX-2

- Maximum ramping depth per cycle to be under maximum D.O.C. ap (2.5 mm)
- Use climb milling. (Refer to the above figure)
- Feed rates should be reduced to 50% of recommended cutting conditions
- Use caution to eliminate incidences caused by producing long chips

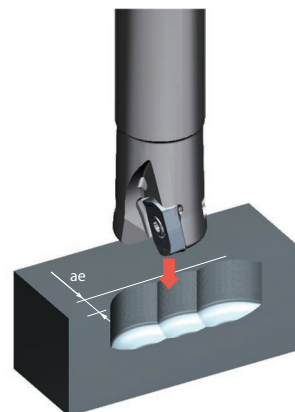
### Drilling tips



Description	GM type	
	Max. drilling depth Pd (mm)	Min. cutting length X for flat bottom surface (mm)
MFH...-04-...	0.6	DCX-12

- It is recommended to reduce feed by 25% of recommendation until the center core is removed
- Axial feed rate recommendation per revolution is  $f \leq 0.2\text{mm/rev}$

### Plunging



Insert description	Maximum width of cut (ae)
LOMU04 Type	5.0 mm

- Reduce feed rate to  $f_z \leq 0.2\text{mm/t}$  when plunging

# Fast, strong, and efficient

**Valve parts 42CrMo4**  $V_c = 180 \text{ m/min}$ ,  $a_p \times a_e = 1.5 \times 32 \text{ mm}$ ,  $f_z = 0.35 \text{ mm/t}$ , BT50

**Helical milling**  
4 -  $\varnothing 60$  (depth 80 mm)

<b>MFH Boost</b> $\varnothing 32$ (4 Inserts)	<b>Q = 132 cc/min</b>	Machining efficiency <b>x 3.5</b>
Conventional A High feed type $\varnothing 32$ (3 Inserts)	<b>Q = 38 cc/min</b>	

The MFH Boost achieved a 3.5 times higher machining efficiency than the conventional tool **by increasing the D.O.C. and number of inserts.** Even with 90 mm overhang portion,  $a_p = 1.5 \text{ mm}$  large D.O.C. machining is possible.

**Industrial parts C50**  $V_c = 150 \text{ m/min}$ ,  $a_p \times a_e = 1.0 \times \sim 20 \text{ mm}$ ,  $f_z = 0.36 \text{ mm/t}$ , BT40

**Slotting**  
**Shouldering**

<b>MFH Boost</b> $\varnothing 25$ (3 Inserts)	<b>Q = 42 cc/min</b>	Machining efficiency <b>x 3.2</b>
Competitor D 90° End mill $\varnothing 25$ (2 Inserts)	<b>Q = 13 cc/min</b>	

The MFH Boost achieved a 3.2 times higher machining efficiency than the competitor **by increasing cutting speed, feed, and number of inserts.** There is no problem with the value of the load meter when increasing to the cutting conditions above.

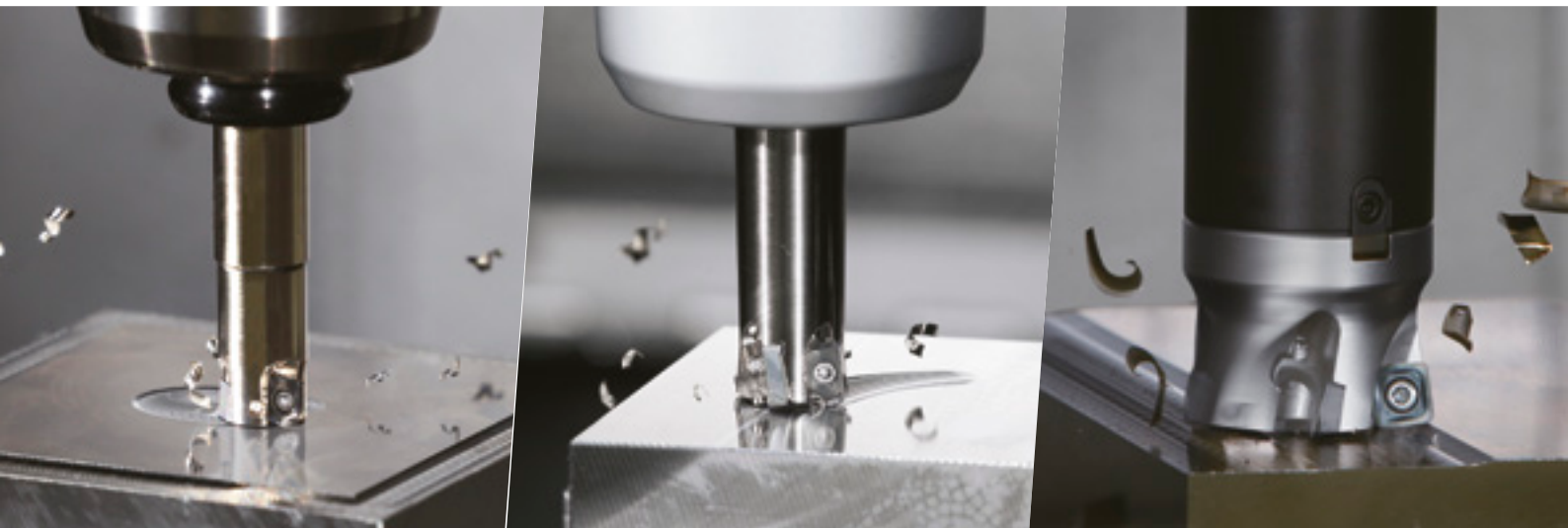
**Mold parts prehardened steel**  $V_c = 120 \text{ m/min}$ ,  $a_p \times a_e = 1.5 \times 30 \text{ mm}$ ,  $f_z = 0.7 \text{ mm/t}$ , Internal air

<b>MFH Boost</b> $\varnothing 50$ (7 Inserts)	<b>Q = 192 cc/min</b>	Machining efficiency <b>x 1.4</b>
Competitor E High feed type $\varnothing 50$ (7 Inserts)	<b>Q = 140 cc/min</b>	

The MFH Boost provides a low cutting forces **even when the feed and  $a_p$  are increased** and achieves a 1.4 times higher machining efficiency than the competitor. Even when machining where the depth of cut is doubled, distortion is equivalent to competitor E.

(User evaluation)

# MFH Series



Stable machining with greater chatter resistance

Cutting diameters starting at  $\varnothing 8$  mm

Reduce cycle time during  
roughing applications

MFH Mini / Micro high feed  
mills for small machining  
centers

New PR18 series grades are  
now available



PR1810 / PR1825 / PR1835



MFH Micro  
 $\varnothing 8 - 16$  mm

MFH Mini  
 $\varnothing 16 - 50$  mm

MFH Harrier  
 $\varnothing 25 - 160$  mm



**KEEPS YOU  
AHEAD**



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

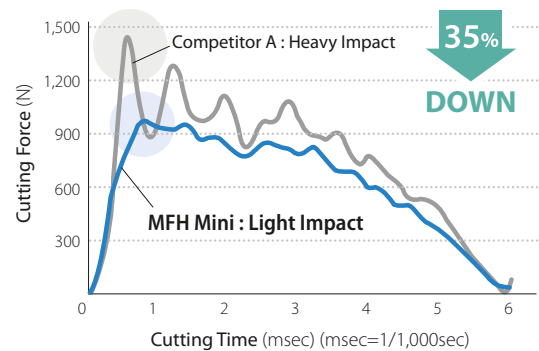


MFH Micro

MFH Mini

MFH Harrier

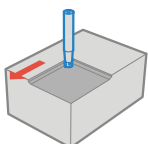
Cutting force and vibration when approaching the workpiece (internal evaluation)  
Ae: Half of cutter diameter



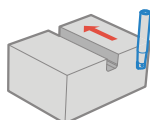
Cutting Conditions:  $V_c = 150$  m/min,  $f_z = 1.0$  mm/t,  $a_p \times a_e = 0.5 \times 8$  mm, Dry  
Cutter Dia. DC = Ø16 mm Workpiece: S50C

2

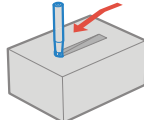
## Wide application range for multiple metalworking processes



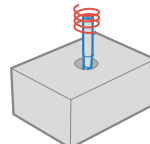
Face milling & shouldering



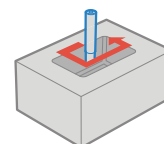
Slotting



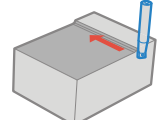
Ramping



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.

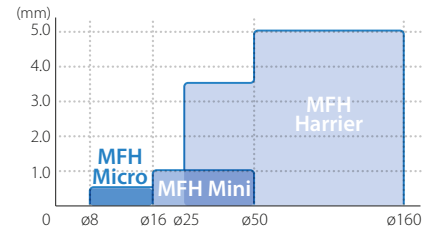
Micro diameter cutter for high feed machining

# MFH Micro

Cutter dia. Ø8 – 16 mm

Low resistance and durable against chatter for highly efficient machining.

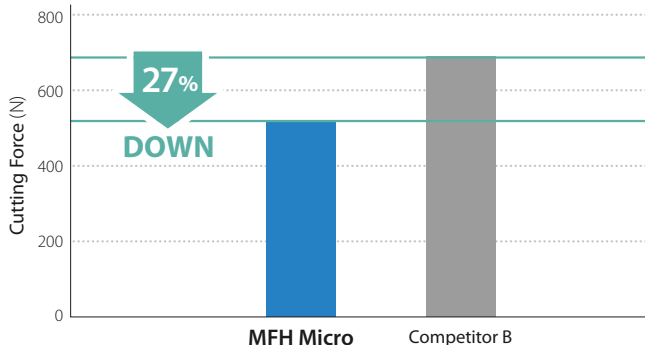
Maximum ap 0.5 mm. Stable high feed machining on a wide range of applications.



## 1 Low resistance and durable against chatter

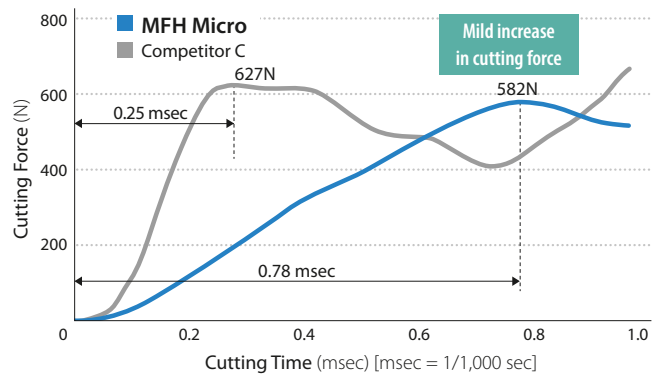
Molded convex cutting edge controls initial impact when entering the workpiece

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)



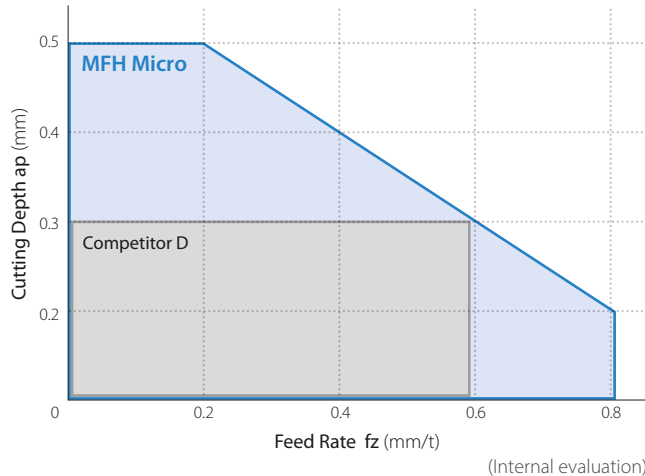
Cutting conditions:  $V_c = 120$  m/min,  $f_z = 0.6$  mm/t,  $a_p \times a_e = 0.4 \times 5$  mm  
Cutter dia. DC = Ø10 mm, dry, workpiece: S50C

## 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)

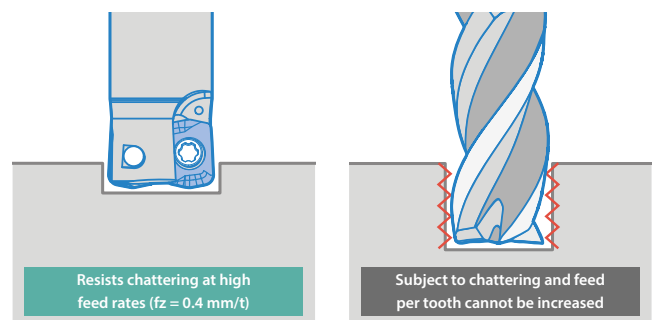


## 3 Replaces solid end mills to reduce machining costs

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	Solid end mill	Q = 12.2 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	↑ x 1.25 Efficiency	$V_c = 80$ m/min, $f_z = 0.04$ mm/t $a_p \times a_e = 3 \times 10$ mm, dry Ø10 (4 flutes)	

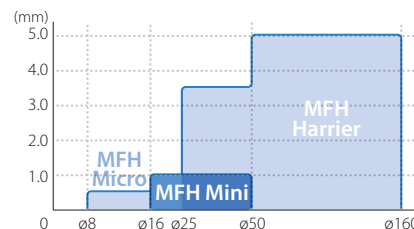


Small diameter cutter for high feed machining

# MFH Mini

Cutter diameter  $\varnothing 16 - 50$  mm

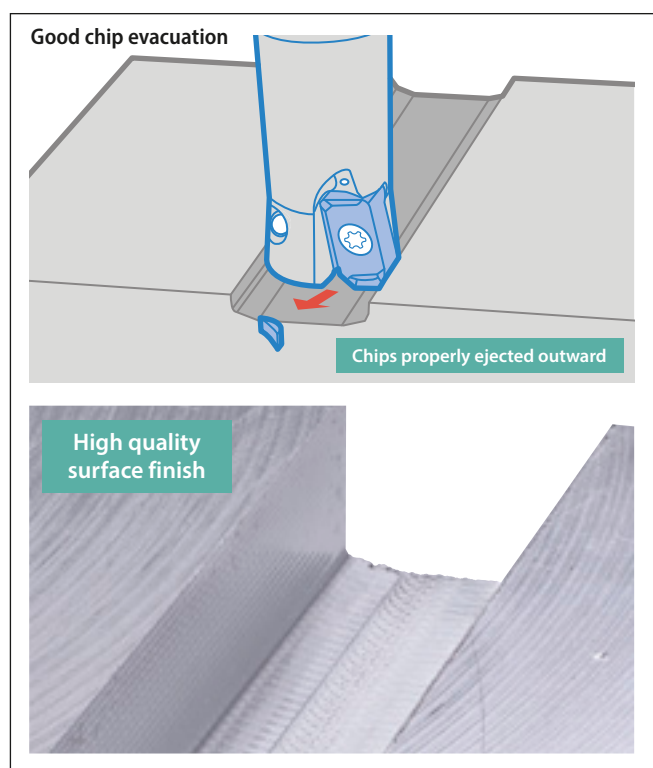
Economical inserts with 4 cutting edges. Small diameter fine pitch type for high efficiency and high feed machining.



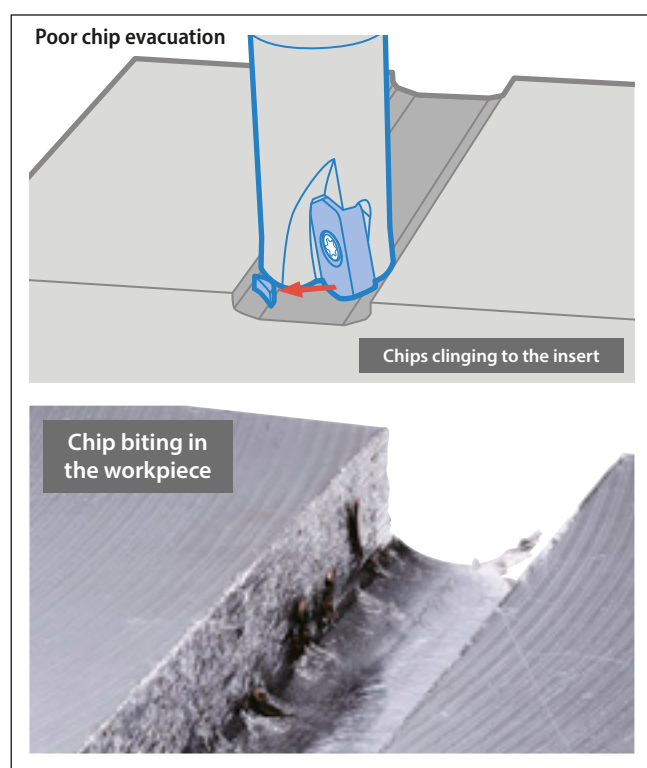
## 1 Good chip evacuation

MFH mini controls chip biting with convex cutting edge

MFH Mini



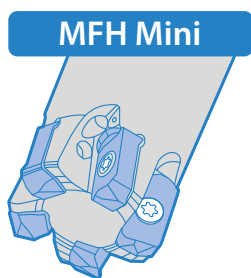
Competitor high feed cutter



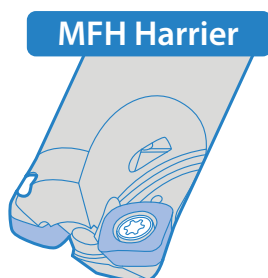
Cutting conditions: Cutter dia. DC =  $\varnothing 16$  mm (2 inserts),  $V_c = 150$  m/min,  $f_z = 0.6$  mm/t,  $a_p = 0.5$  mm (20 pass): Total 10 mm  $\times$  16 mm, dry, workpiece: SS400

## 2 Fine pitch for efficient machining

Cutter diameter 25 mm type



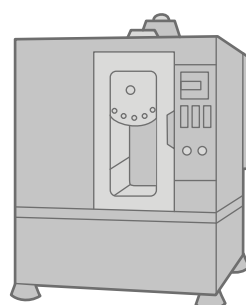
5 inserts MFH25-S25-03-5T



2 inserts MFH25-S25-10-2T

## 3 Suitable for roughing of molds

High feed machining in small machining centers



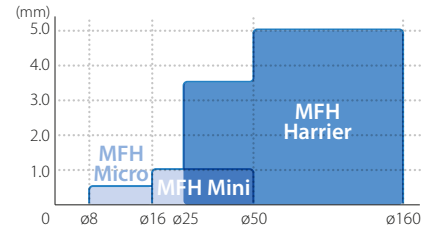
Applicable for BT30/ BT40

Highly efficiency and high feed cutter

# MFH Harrier

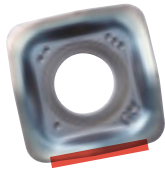
Cutter dia. Ø25 – 160 mm

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



## 1 Large insert line-up for various applications

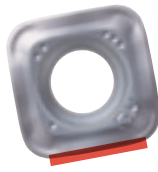
### GM (general purpose)



First recommendation for general machining

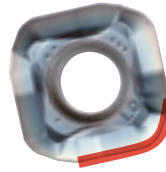
Multiple metalworking processes

### GH (tough edge)



Excellent fracture resistance

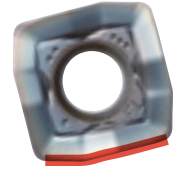
### LD (large ap)



MAX. ap = 5 mm

Available for scale removal as well as high feed cutting

### FL (wiper edge)



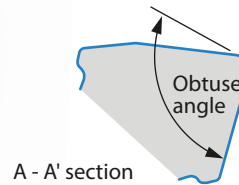
Wiper edge with low cutting forces

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

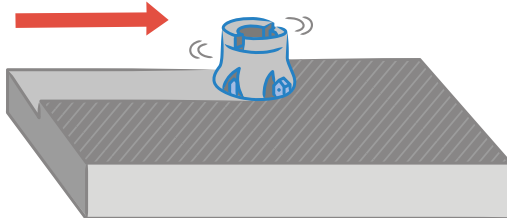
Combining with PR015S is suitable for machining hardened material  
Improved fracture resistance

Feature

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

Large ap for scale removal

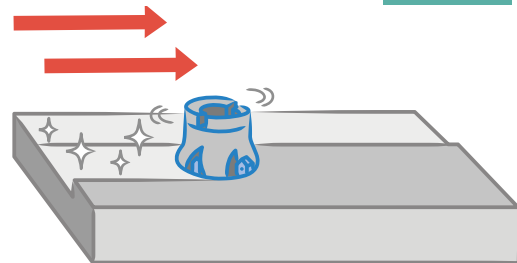
ap = 4.0 mm



(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

Efficiency

x2.6

Conventional Cutter

151 cc/min

**NEW** PR18 Series

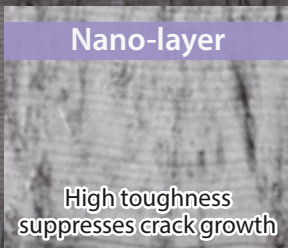
Double lamination technology with special nano layer  
 MEGACOAT NANO EX provides longer tool life  
 Features 3 grades: PR1825/PR1835/PR1810



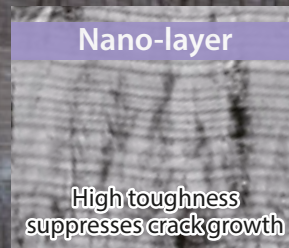
**Double lamination technology maintains longer tool Life**

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**



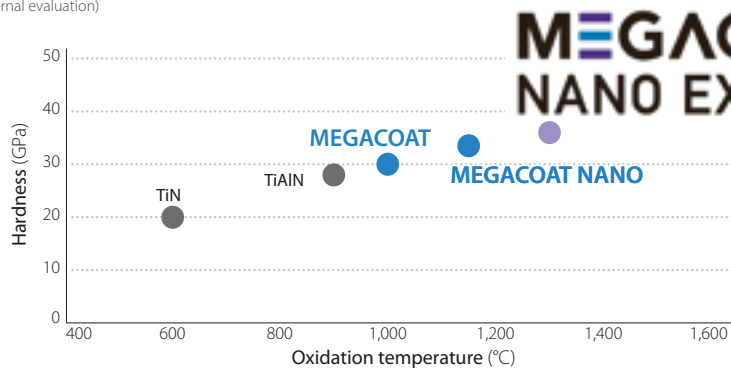
**AlTi-based coating with excellent heat resistance**

**Multi-layering of high-performance nano layers**

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

CG Image

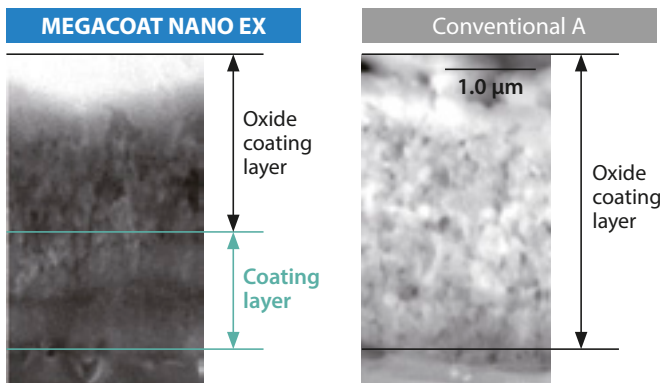
Coating characteristics (Internal evaluation)



**Excellent oxidation resistance**

Oxidation progression comparison (Internal evaluation)

Suppresses oxidation progression with excellent oxidation resistance

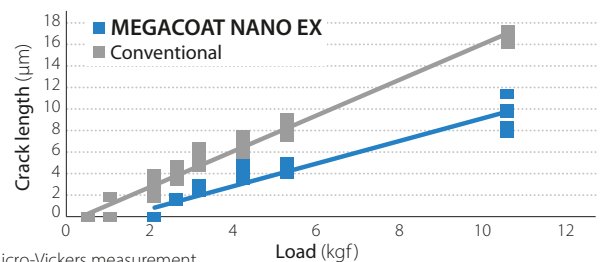
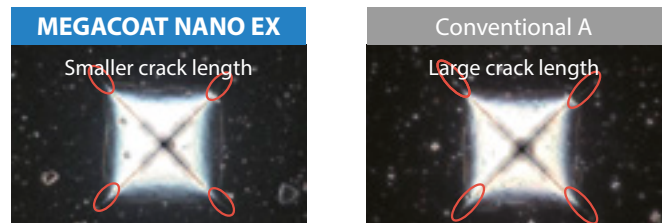


\*Section after holding at 1,200 degrees for 30 minutes in air

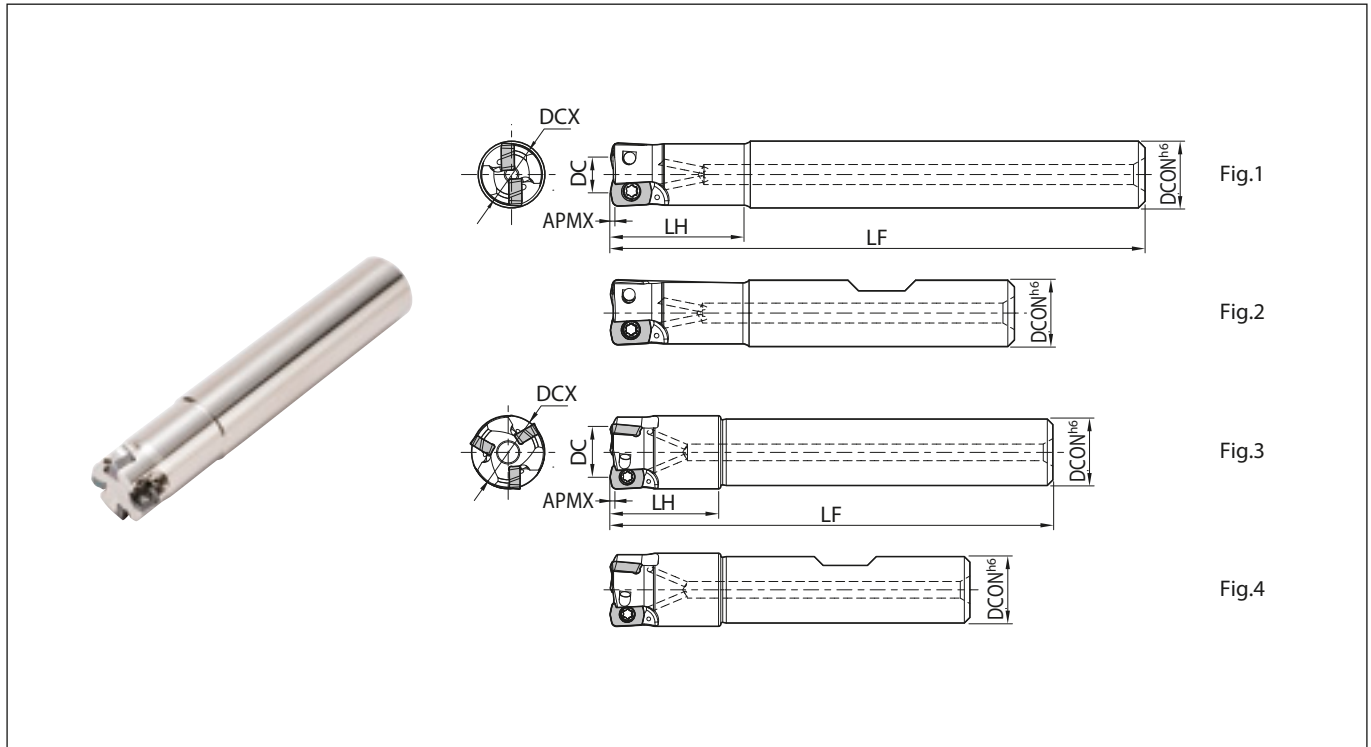
**High coating toughness**

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 <sup>-1</sup> )
				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.

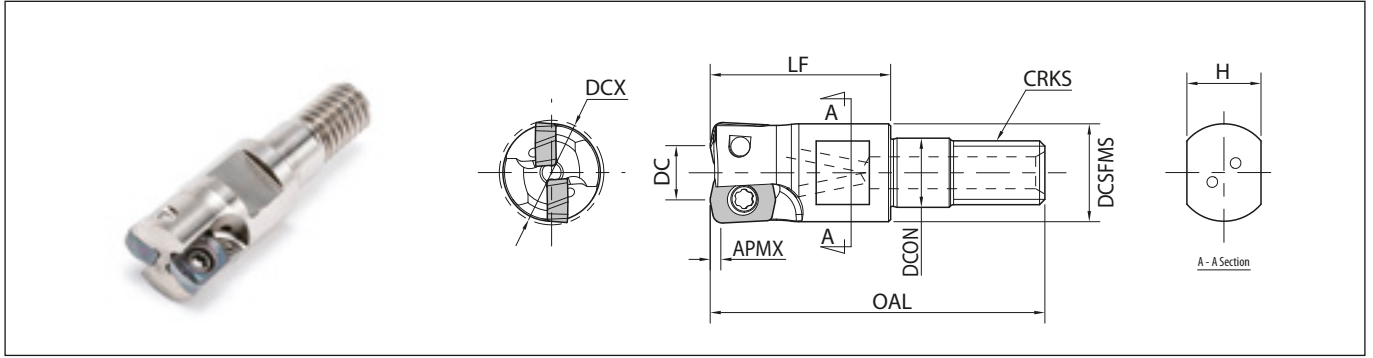
● : Available

Spare parts and applicable inserts

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

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

# MFH Micro | Screw on type



## Toolholder dimensions

Description	Availability	No. of inserts	Dimensions (mm)									Max. ramping angle	Rake angle A.R.	Coolant hole	Max. revolution (min <sup>-1</sup> )
			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 Recommended torque for insert clamp 0.5 nm	 FTP-6	 P-37	LPGT010210ER-GM

### 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	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

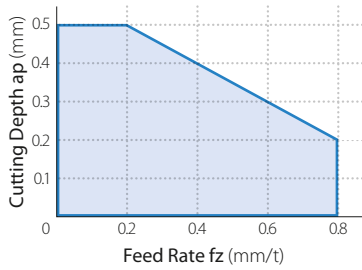
# MFH Micro | Applicable inserts

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	●	●	●

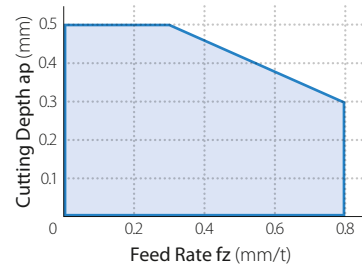
● : Availability

# MFH Micro | Cutting performance

Cutting diameter: Ø8 – 12 mm



Cutting diameter: Ø14 – 16 mm



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

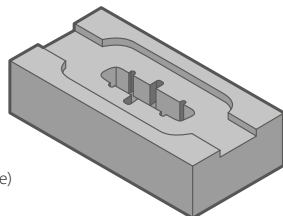
Insert	Workpiece	Holder description and feed rate (fz: mm/t) Recommended feed ap = 0.3 mm (reference value)					Recommended insert grade (Vc: m/min)		
		MFH08-... -1T	MFH10-... -2T	MFH12-... -3T	MFH14-... -3T	MFH16-... -4T	MEGACOAT NANO		CVD coated carbide
							PR1825	PR1835	CA6535
GM	Carbon steel	0.2 – 0.4 – 0.6			0.2 – 0.5 – 0.8		★ 120 – 180 – 250	☆ 120 – 180 – 250	–
	Alloy steel	0.2 – 0.4 – 0.6			0.2 – 0.5 – 0.8		★ 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	0.2 – 0.3 – 0.5			0.2 – 0.4 – 0.6		–	☆ 150 – 200 – 250	★ 180 – 240 – 300
	Precipitation hardened stainless steel	0.2 – 0.3 – 0.5			0.2 – 0.4 – 0.6		–	★ 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	0.2 – 0.25 – 0.3			0.2 – 0.25 – 0.4		–	★ 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<sup>-1</sup>)  
 ap x ae = 0.3 x ~ 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**

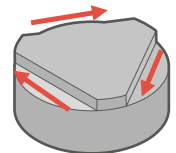
Competitor F Ø12-3T **3.4 cc/min**

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<sup>-1</sup>)  
 ap x ae = 0.4 x 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

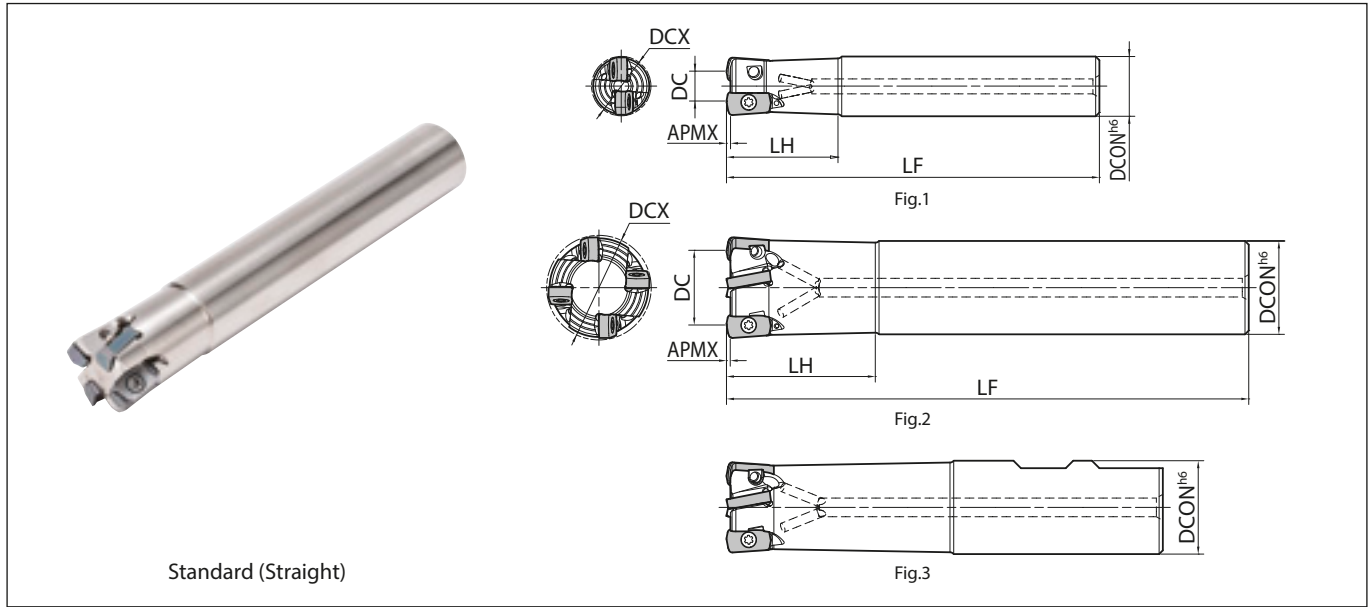
**PR1535** **7 min**

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	A.R.										
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				1	-10°	Yes	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							1	-10°	Yes	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				
MFH050R-03-8T-M					

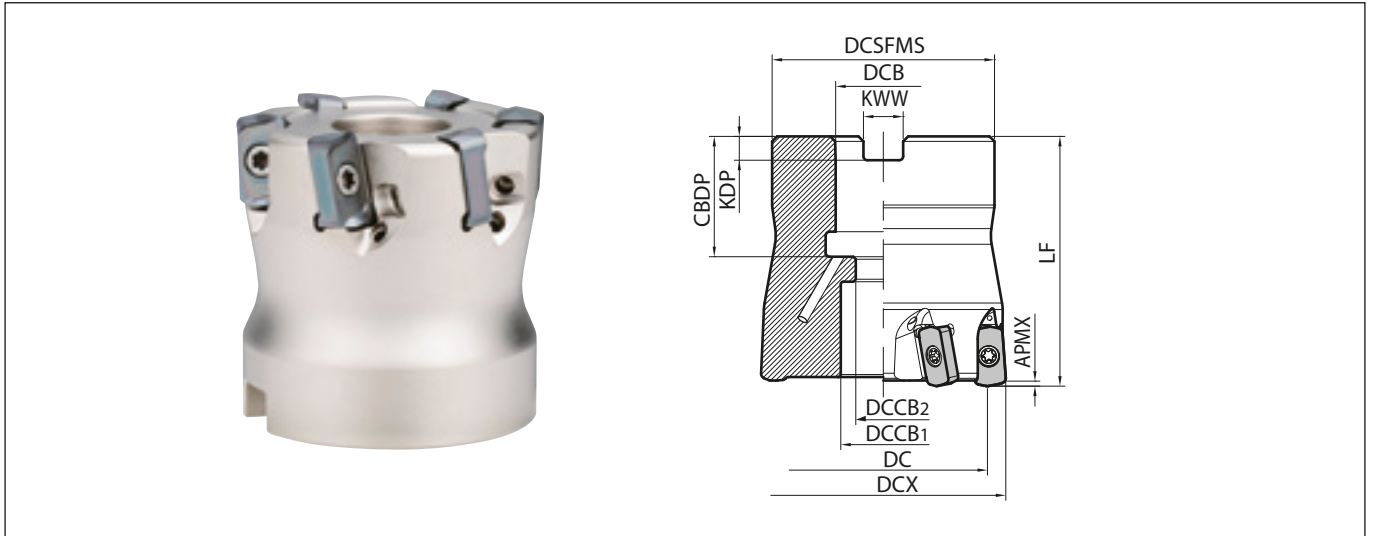
**Caution with max. revolution**  
Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page 12.

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

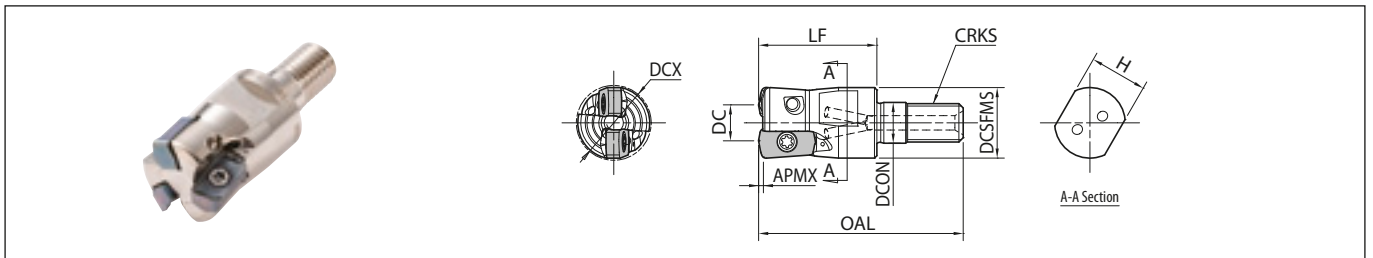
Description	Avail-ability	No. of Inserts	Dimensions (mm)											Rake Angle	Coolant Hole	Weight (kg)	Max. Revolution (min <sup>-1</sup> )
			DCX	DC	DCSFMS	DCB	DCCB <sub>1</sub>	DCCB <sub>2</sub>	LF	CBDP	KDP	KWW	APMX				
MFH 040R-03-5T-M	●	5	40	32	38	16	15	9	40	19	5.6	8.4	1	-10°	Yes	0.2	9,900
040R-03-6T-M	●	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

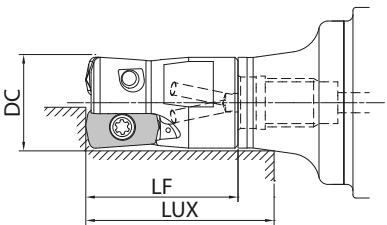
Description	Avail-ability	No. of Inserts	Dimensions (mm)										Rake Angle	Coolant Hole	Max. Revolution (min <sup>-1</sup> )
			DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R.			
MFH 16-M08-03-2T	●	2	16	8	14.7	8.5	42	25	M8×P1.25	12	1	-10°	Yes	18,880	
MFH 17-M08-03-2T	●	2	17	9	14.7	8.5	42	25	M8×P1.25	12				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


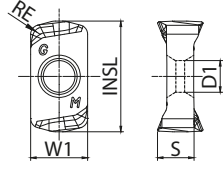

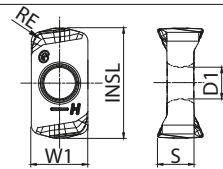
Effective depth of assembled tool



Arbor description	Applicable screw on type			Effective depth of assembled tool (mm)
	Description	Cutting diameter	Dimension	
		DC	LF	LUX
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

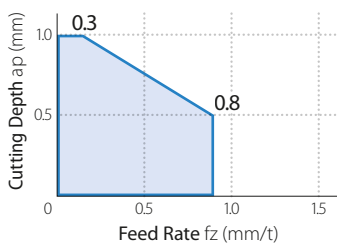
MFH Mini | Applicable inserts

Insert	Description	Dimensions (mm)					MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide
		W1	S	D1	INSL	RE	PR1835	PR1825	PR1810	PR015S	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

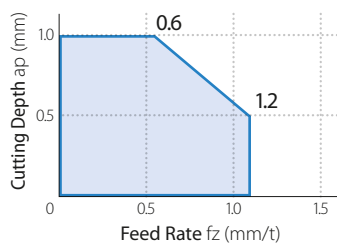
MFH Mini | Cutting performance

Fine pitch



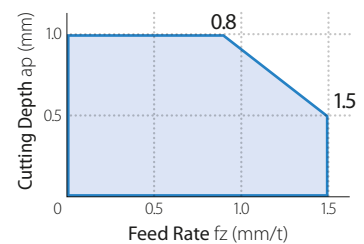
MFH20-...-4T, MFH22-...-4T,  
MFH25-...-5T, MFH28-...-5T,  
MF32-...-6T

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-...

Caution:

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

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	☆	★	-	-	-	
	Alloy steel								120 - 180 - 250	120 - 180 - 250	-	-	-	
	Die 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 - 0.4 - 0.6	☆	☆	-	GH ★	-
		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	-	☆	-	GH ★	-
		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	-	☆	-	GH ★	-
		55~60HRC	0.03 - 0.06 - 0.1 (* Recommended only for GH chipbreaker)							-	-	-	GH ☆	-
	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	GM ★	GM ☆	-	-	-	
	Martensitic stainless steel								100 - 160 - 200	100 - 160 - 200	-	-	★	
	Precipitation hardened stainless steel								150 - 200 - 250	-	-	-	-	180 - 240 - 300
	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	-	-	★	-	-	
	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	-	-	★	-	-	
	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	☆	-	-	-	★	
	Titanium alloy								20 - 30 - 50	-	-	-	20 - 30 - 50	
									GM ★	-	GM ☆	-	-	
								40 - 60 - 80	-	30 - 50 - 70	-	-		

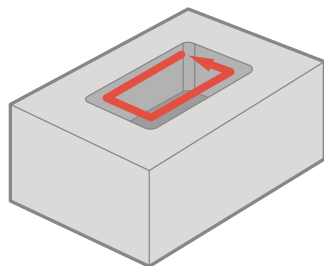
Standard pitch Fine pitch

- 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<sup>-1</sup>)  
 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**

Tool life

MAX  
x2

Competitor H  
(4 Inserts)

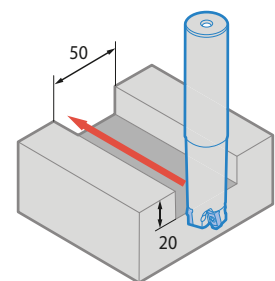
**1.0~1.5 H**

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<sup>-1</sup>)  
 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**

Tool life

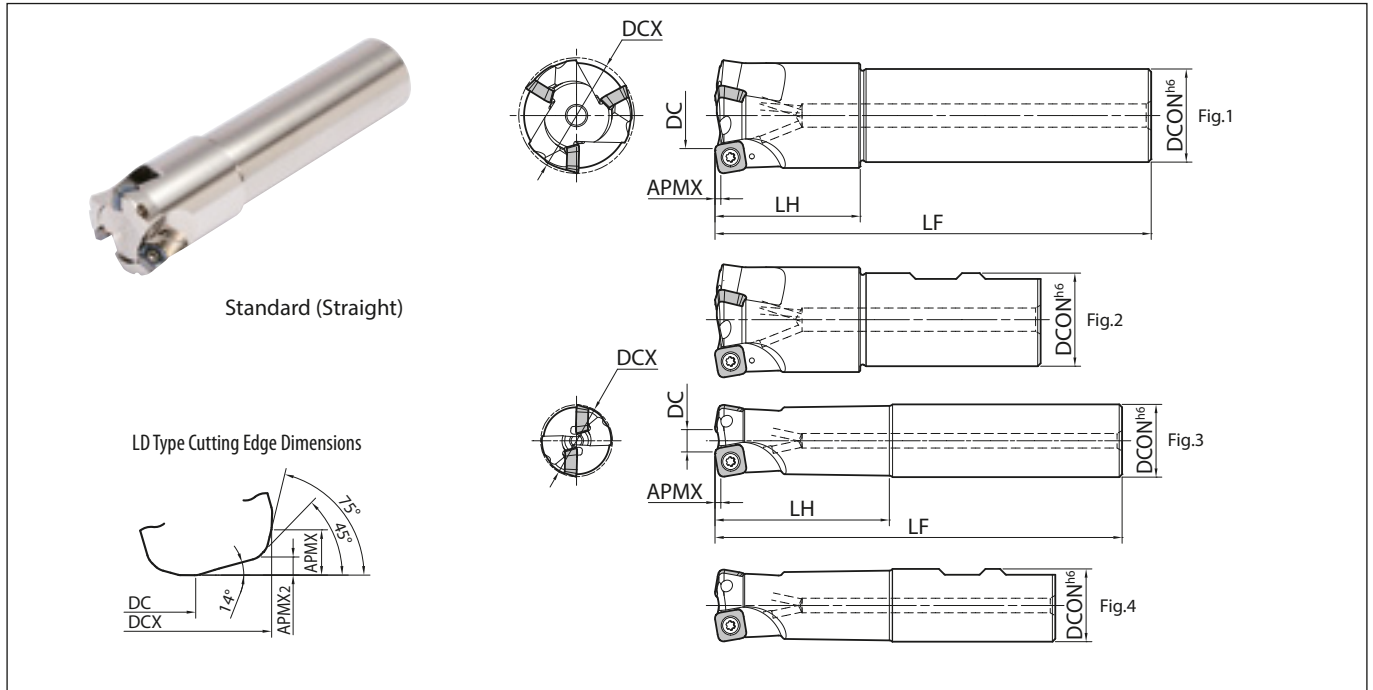
x1.8

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	Availability	No. of inserts	Dimensions (mm)								Rake angle	Coolant hole	Drawing	Weight (kg)	Max. revolution (min-1)	
				DCX	DC			DCON	LF	LH	APMX						APMX <sub>2</sub>
GM-GH	LD	FL	A.R.														
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
	MFH 32-S32-10-3T	●	3	32	15	19.5	18.5	32	150	70						0.8	14,000
	MFH 35-S32-10-2T	●	2	35	18	22.5	21.5	32	150	50					Fig.1	0.8	13,000
	MFH 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
	MFH 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
	MFH 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 long 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				

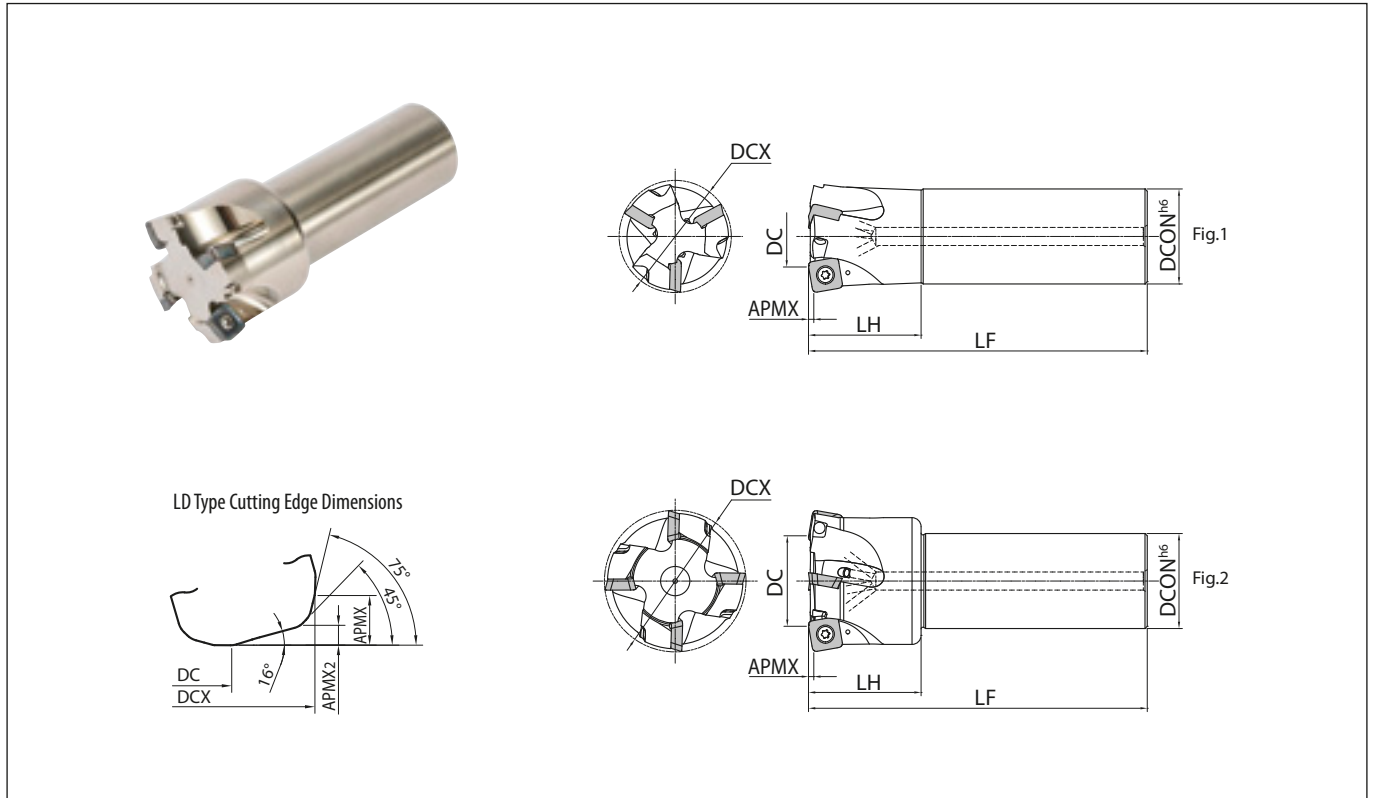
Caution with max. revolution

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 A.R.	Coolant hole	Drawing	Weight (kg)	Max. revolution (min-1)
			DCX	DC			DCON	LF	LH	APMX	APMX <sub>2</sub>					
GM-GH	LD	FL														
MFH50-S42-14-3T	●	3	50	27	33	32	42	150	50					Fig. 1	1.4	8,800
MFH63-S42-14-4T	●	4	63	40	46	45	42	150	50	2 *(5)	2	+10°	Yes	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 Recommended torque for insert clamp 4.5 nm	 TTP-20	 P-37	SOMT140520ER-GM SOMT140520ER-GH SOMT140520ER-LD SOMT140514ER-FL

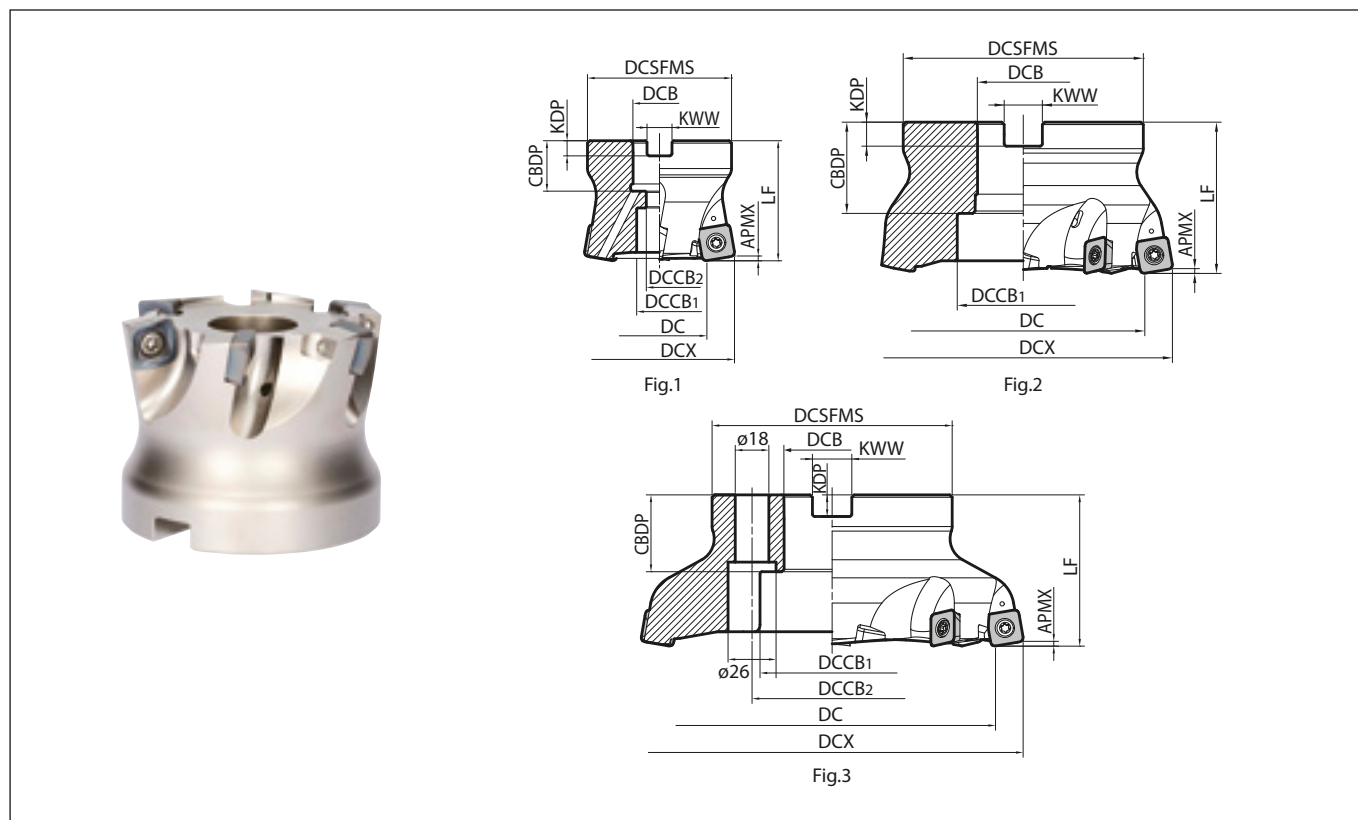
Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page P19.

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 (SOMT10 type)

Description	Availability	No. of inserts	Dimensions (mm)													Rake angle A.R.	Coolant hole	Drawing	Weight (kg)	Max. revolution (min-1)	
			DCX	DC			DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW	APMX						APMX <sup>2</sup> *1
				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 <sub>1</sub>	DCCB <sub>2</sub>	LF	CBDP	KDP	KWW	APMX						APMX <sub>2</sub> *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						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					3.7	4,200		
																					No	Fig.3

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.

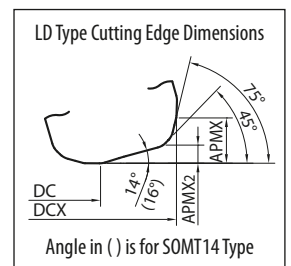
Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause chips and parts to scatter even under no load.

## Spare parts and applicable inserts

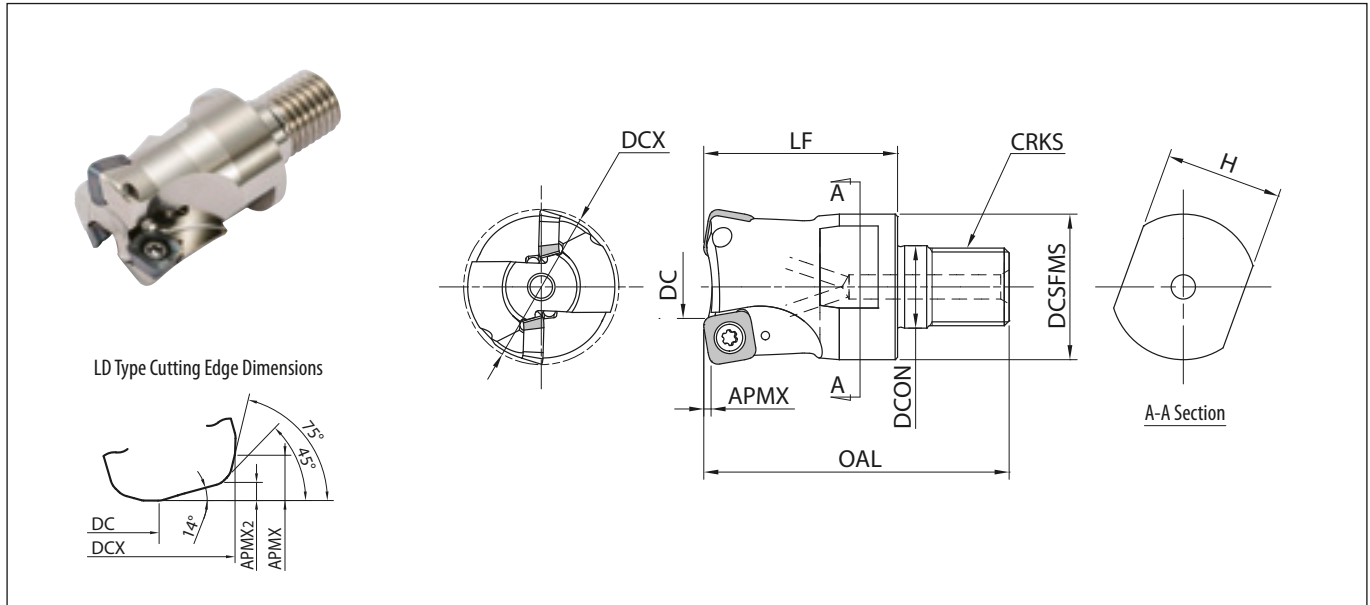
Description	Spare Parts					Applicable Inserts			
	Clamp Screw	Wrench		Anti-Seize Compound	Arbor Clamp Bolt				
MFH050R-10-...(-M)	SB-4090TRPN	DTPM-15	TTP	MP-1	P-37	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL			
MFH063R-10-...(-22M)									
MFH063R-10-...-27M									
MFH080R-10-...							Recommended Torque for Insert Clamp 3.5N·m		
MFH080R-10-...-M									
MFH050R-14-...(-M)	SB-50120TRP	TTP-20	TTP	MP-1	P-37				
MFH063R-14-...(-22M)									
MFH063R-14-...-27M									
MFH080R-14-...							Recommended Torque for Insert Clamp 4.5N·m		
MFH080R-14-...-M									
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



# MFH Harrier | Screw on type



## 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 <sub>2</sub>				A.R.
				GM-GH	LD	FL												
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 Recommended torque for insert clamp 3.5 Nm	 DTPM-15	 P-37	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL

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

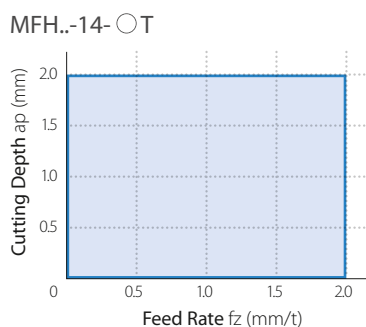
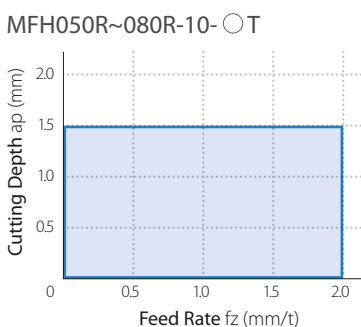
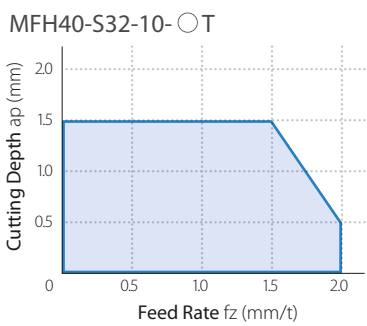
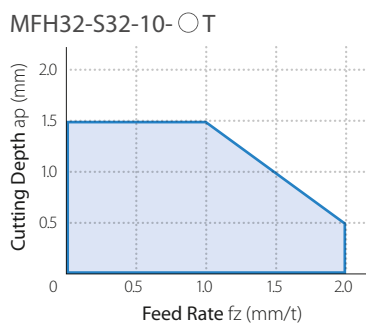
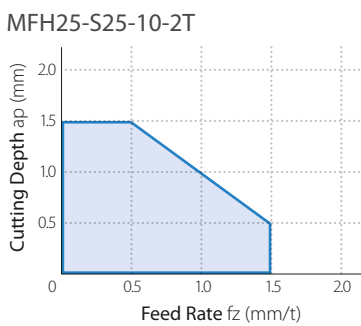
Recommended cutting conditions → p19, p20

# MFH Harrier | Applicable inserts

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					★	☆					P13 ~ P17	
		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		AN	PR1835	PR1825	PR1810	PR0155	CA6535
 General purpose	SOMT100420ER-GM	10.30	4.58	4.6	-	2.0	16	●	●	●	-	●		
	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)



- 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

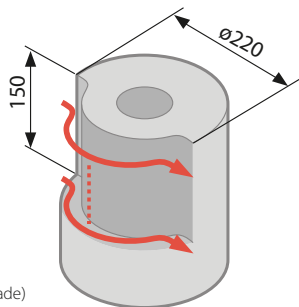
Insert	Workpiece	Holder description and feed rate (fz: mm/t)					Recommended insert grade (Vc: m/min)					
		MFH25-	MFH32-	MFH40-	MFH...R-10	MFH...-14	MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide	
							PR1835	PR1825	PR1810	PR0155	CA6535	
GM GH	Carbon steel	0.5 - 0.8 - 1.0 (ap ≤ 1.0mm) 0.2 - 0.4 - 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 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)	★ 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 ~40 HRC	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



Vc = 220 m/min (n = 1,750 min<sup>-1</sup>)  
 ap x ae = 1.5 x 30 mm  
 fz = 0.7 mm/t (Vf = 4,900 mm/min)  
 Dry  
 MFH40-S32-10-4T (4 inserts)  
 SOMT140520ER-GM PR1525 (Conventional grade)

Cutting time

**PR1525**

**950 sec**

**75%**  
Cutting time

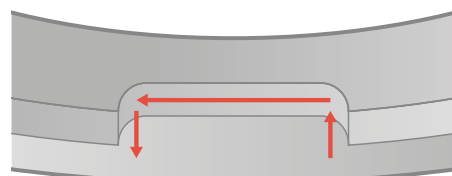
Competitor J (90° Cutter)

**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



Reduced chattering

Vc = 120 m/min (n = 1,190 min<sup>-1</sup>), 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**

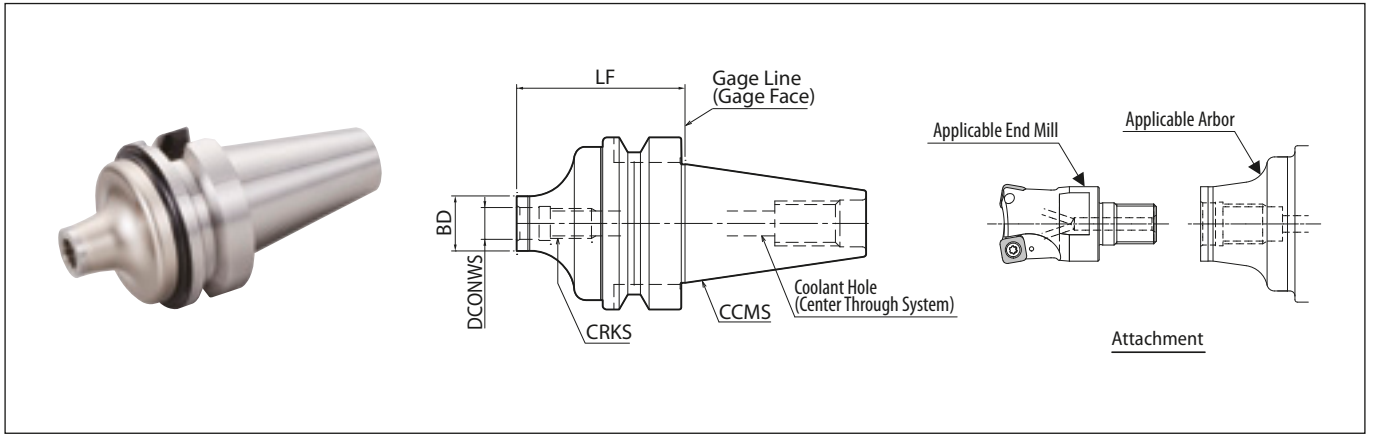
Efficiency  
**x 1.6**

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**

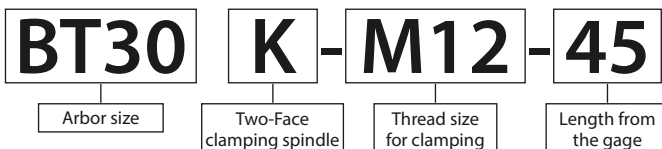
Description	Availability	Dimensions (mm)				Coolant hole	Arbor Two-face clamping	Applicable end mill (Head)
		LF	BD	DCONWS	CRKS		CCMS	
BT30K- M08-45	●	45	14.7	8.5	M8×P1.25	Yes	BT30	MFH...M08-..
	●	45	18.7	10.5	M10×P1.5			MFH...M10-..
	●	45	23	12.5	M12×P1.75			MFH...M12-..
BT40K- M08-55	●	55	14.7	8.5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

● : Available

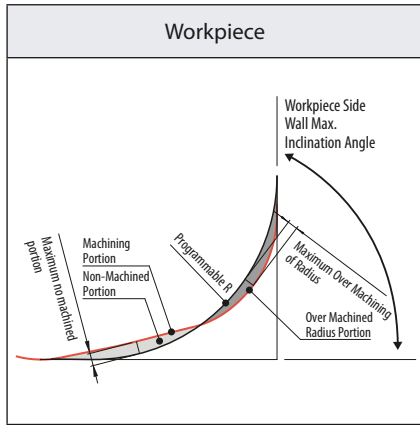
**Effective depth of assembled tool**

Arbor description	Applicable screw on type			Effective depth of assembled tool (mm)
	Description	Cutting dia. (mm)	Dimensions (mm)	LUX
		DC	LF	
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
BT40K- M08-55	MFH18-M08-03...	18	25	34.3
	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**



# 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

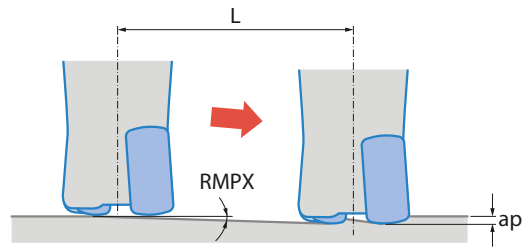
Description	Cutting dia. DCX (mm)	25	28	32	35	40	50	63	80
MFH Harrier (MFH...-10-...)	Max. ramping angle RMPX	5°	4.5°	4°	3.5°	3°	2.5°	2°	1°
	tan RMPX	0.087	0.078	0.070	0.061	0.052	0.043	0.035	0.017

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%.

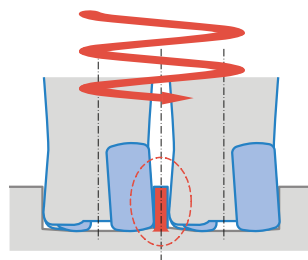
Formula for max. cutting length (L) at max. ramping angle  $L = \frac{ap}{\tan RMPX}$



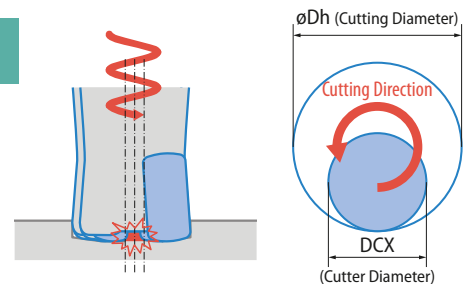
## Helical milling

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

**Exceeding max. machining dia.**  
Center core remains after machining



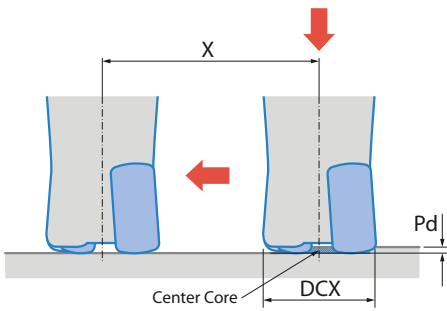
**Under min. machining dia.**  
Center core hits holder body



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

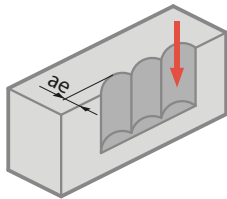
Unit: mm

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



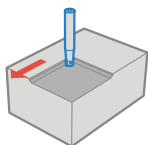
LD and FL chipbreakers are not available for plunging.  
Reduce feed rate to  $f_z \leq 0.2\text{mm/t}$  when plunging.

Unit: mm

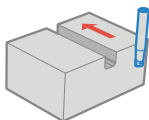
Description	Maximum width of cut (ae)
MFH Micro	1.7
MFH Mini	3.5
MFH Harrier (MFH...-10-...)	8 (GM - GH)
MFH Harrier (MFH...-14-...)	11.5 (GM - GH)

## 3D machining | MFH Harrier

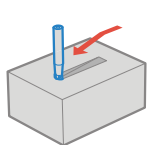
GM and GH chipbreakers are available for all the applications.



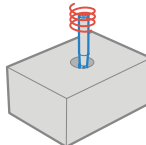
Face milling & shouldering



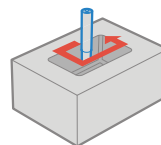
Slotting



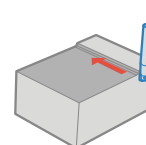
Ramping



Helical milling

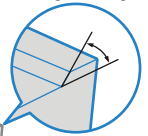


Pocketing



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



# PR18 Series



Longer tool life with next-generation coating for milling

MEGACOAT NANO EX coating technology

Exceptional tool life



**PR1825** for steel (Wear resistance oriented)

**PR1835** for steel (Stability oriented)

for stainless steel

**PR1810** for cast iron



Next-generation PVD coating for milling

# PR18 Series

Double lamination technology with special nano layer

MEGACOAT NANO EX provides longer tool life

PR18 Series grades are applicable for various machining environments.



## Double lamination technology

Special Nano Layer x Multilayer Lamination

AlTi-based  
special nano layer

AlCr-based  
special nano layer

CG image

1

# New PVD coating MEGACOAT NANO EX provides long tool life

Kyocera's nano layer coating technology

## MEGACOAT NANO

Special nano-laminated coating with excellent abrasion and oxidation resistance



## MEGACOAT NANO EX

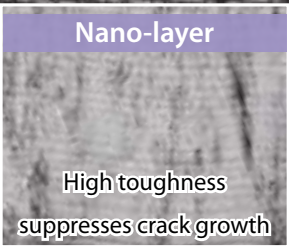
### New coating property improvements



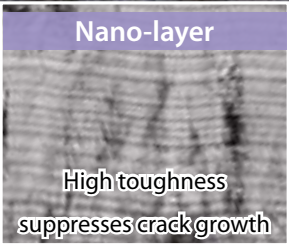
### Double lamination technology maintains longer tool life

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

## Special nano layer x Multilayer lamination



**AlCr-based coating**  
with excellent abrasion resistance

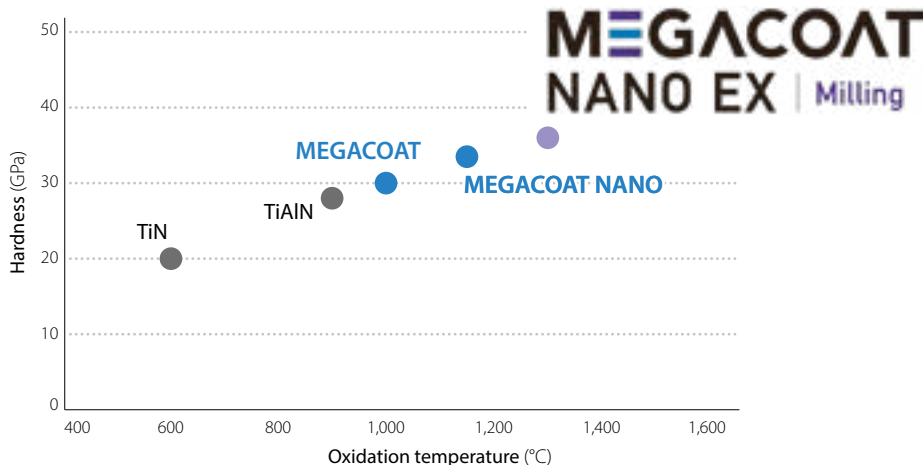


**AlTi-based coating**  
with excellent heat resistance

**Multi-layering of high-performance nano layers**  
Increases toughness with the suppression of crack growth and optimization of internal stress

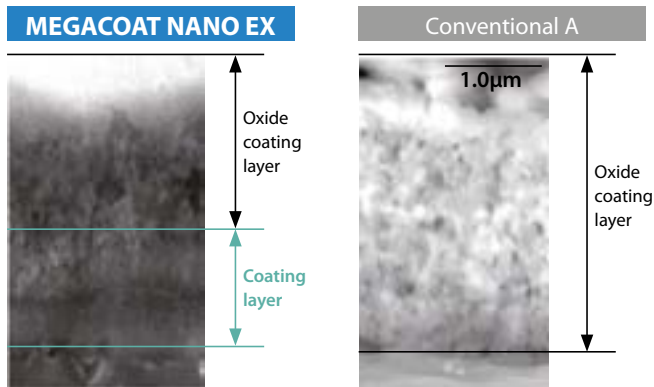
CG image

Coating characteristics (Internal evaluation)



Excellent oxidation resistance

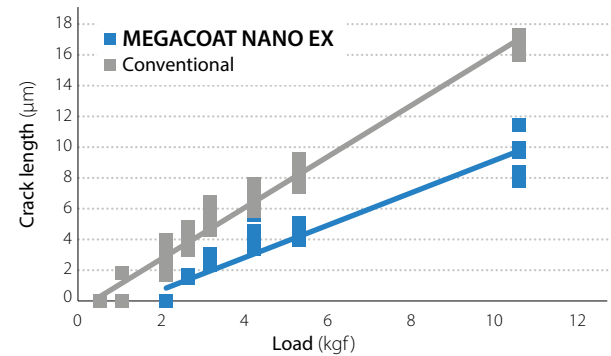
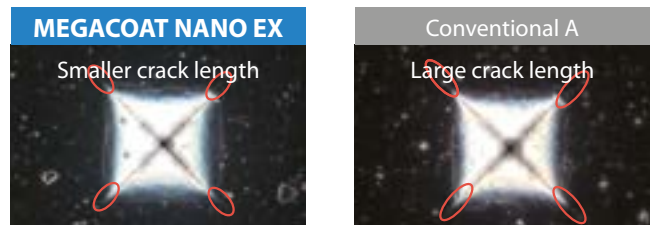
Oxidation progression comparison (Internal evaluation)  
 Suppresses oxidation progression with excellent oxidation resistance



\*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

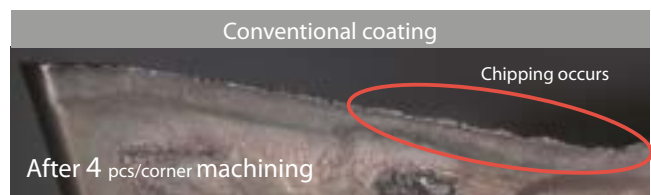
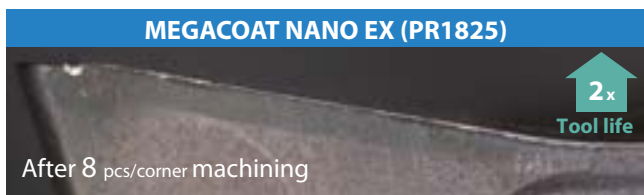


\*Micro-Vickers measurement



2x longer tool life. Cutting edge remains in good condition.

Guides S50C  
 Edge condition



MEGACOAT NANO EX has 2x longer tool life than conventional coating. The cutting edge remains in good condition.  
 Quiet cutting noise

Cutting conditions: Vc = 200 m/min, ap = 2.0 mm, fz = 0.13 mm/t, Dry BDMT170408ER-JT (PR1825) MEC ø25 (2 Inserts)

(User evaluation)

## Case Studies

### Mechanical parts S45C

Vc = 160 m/min  
ap = 1.0 mm  
fz = 0.15 mm/t  
Wet  
MA90-25S20-09T3C  
LOGU090408ER-GM



Number of parts

PR1825

15 pcs/corner

2.5x  
Tool life

Conventional C 6 pcs/corner

Proprietary insert shape suppresses wear progression of main cutting edge and wiper edge  
Provides superior surface finish and 2.5x longer tool life

(User evaluation)

### Housing SUS316

Vc = 90 m/min  
ap = 2.0 mm  
fz = 0.18 mm/t  
Dry  
MB45-063R-14T5C-M  
SNMU1406ANER-GM



Number of parts

PR1825

30 pcs/corner

1.6x  
Tool life

Conventional D 18 pcs/corner

Unique low cutting force wiper edge design reduces chattering  
Shows 1.6x longer tool life

(User evaluation)

### General machine parts FCD450

Vc = 120 m/min  
ap = 1.0 mm  
fz = 0.19 mm/t  
Dry  
MFWN90080R-S32-5T  
WNMU080608EN-GM



Number of parts

PR1825

65 pcs/corner

1.6x  
Tool life

Conventional E 40 pcs/corner

Shows stable machining without insert fracture  
Shows 1.6x longer tool life

(User evaluation)

### Mechanical parts SCM420

Vc = 130 m/min  
ap = 13.0 mm  
fz = 0.07 mm/t  
Wet  
MECH025-S25-11-4-2T  
BDMT11T308ER-N2/N3



Number of parts

PR1825

6 pcs/corner

(Cutting distance : 38.1 m)

1.5x  
Tool life

Conventional F 4 pcs/corner

(Cutting distance : 25.4 m)

Good cutting edge condition in heavy machining with large D.O.C.  
1.5x longer tool life

(User evaluation)

### Mold parts Plastic mold steel

Vc = 120 m/min  
ap = 0.3 mm  
fz = 1.3 mm/t  
Wet  
MFH25-S25-03-5T  
LOGU030310ER-GM



Number of parts

PR1835

150 pcs/corner

2.5x  
Tool life

Conventional G 60 pcs/corner

Stable machining without chatter even in high-feed machining  
Maintains good cutting edge condition and achieves 2.5x longer tool life

(User evaluation)

### Body parts FC250

Vc = 360 m/min  
ap = 0.35 mm  
fz = 0.08 mm/t  
Wet  
MFPN45100R-8T  
PNMU1205ANER-GH



Number of parts

PR1810

200 pcs/corner

2x  
Tool life

Conventional H 100 pcs/corner

Improved tool life and 10 corners on both sides for significant cost savings

(User evaluation)

## 2

# Compatible with various machining environments. Substantial lineup

**PR1825**

**P**

for steel (Wear resistance oriented)

**PR1835**

**M**

for steel (Stability oriented)  
for stainless steel (1st recommendation)

**PR1810**

**K**

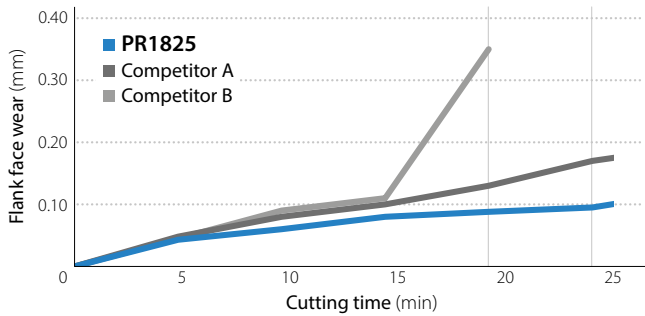
for cast iron

Workpiece material	P Steel					M Stainless steel					K Cast iron				
	ISO	01	10	20	30	40	01	10	20	30	40	01	10	20	30
Lineup	Wear, resistance oriented					1st recommendation					1st recommendation				
	<div style="background-color: #0070C0; color: white; padding: 5px; text-align: center;">PR1825</div>					<div style="background-color: #FFA500; color: white; padding: 5px; text-align: center;">PR1835</div>					<div style="background-color: #C0392B; color: white; padding: 5px; text-align: center;">PR1810</div>				
	Stability oriented														
	<div style="background-color: #0070C0; color: white; padding: 5px; text-align: center;">PR1835</div>														

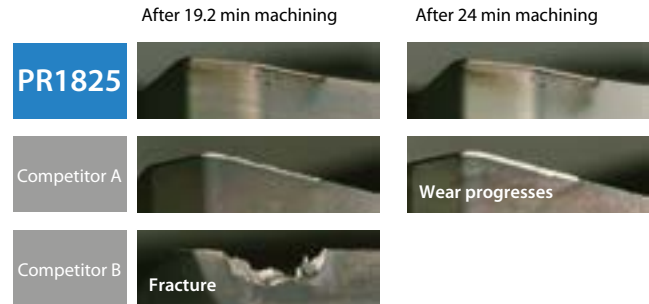
**PR1825**

Carbide base material with an excellent balance of hardness, toughness and versatility

Wear resistance comparison (Internal evaluation)



Edge condition

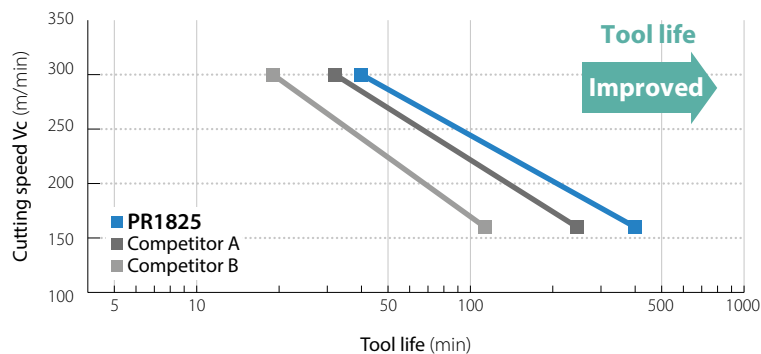


Cutting Conditions :  $V_c = 150$  m/min,  $a_p \times a_e = 2$  mm x 65 mm,  $f_z = 0.12$  mm/t, SKD11, Dry PNMU1205ANER-GM (MFPN45)

V-T graph (Internal evaluation)

Life criteria :  
Flank face wear = 0.10 mm

Cutting Conditions :  
 $V_c = 160 / 300$  m/min  
 $a_p \times a_e = 2$  x 110 mm,  $f_z = 0.12$  mm/t  
SCM440 Dry  
PNMU1205ANER-GM (MFPN45)





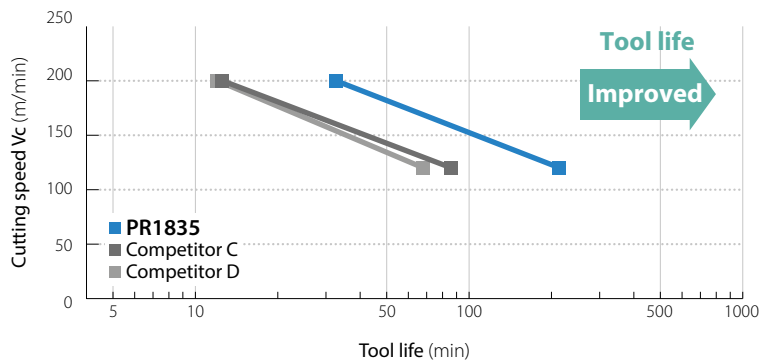
**PR1835**

Carbide base material with superior impact resistance and stability oriented  
Improves the toughness of the base material by optimizing the particle shape and homogenizing the structure.

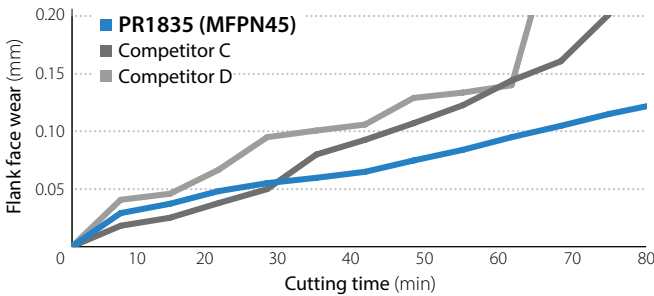
**V-T graph** (Internal evaluation)

Life criteria :  
Flank face wear = 0.10 mm

Cutting Conditions :  
Vc = **120 / 200** m/min  
ap x ae = 2 x 110 mm, fz = 0.12 mm/t  
SUS304 Dry  
PNMU1205ANER-SM (MFPN45)

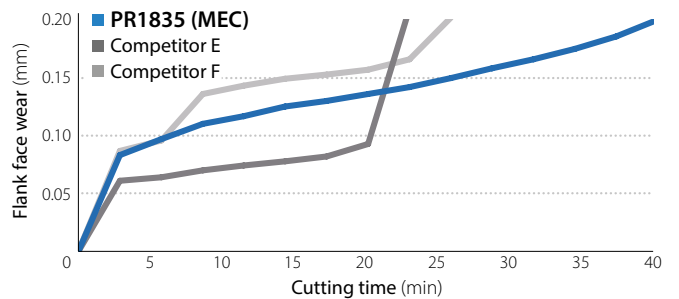


**Wear resistance comparison** (Internal evaluation)



Cutting Conditions : Vc = 150 m/min, ap x ae = 2 x 80 mm, fz = 0.1 mm/t  
SUS304, Dry PNMU1205ANER-SM

**Wear resistance comparison** (Internal evaluation)

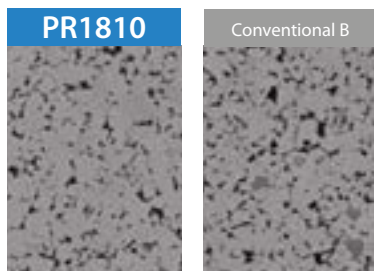


Cutting Conditions : Vc = 120 m/min, ap x ae = 2 x 15 mm, fz = 0.1 mm/t  
SUS304, Dry BDMT11T308ER-JS

**PR1810**

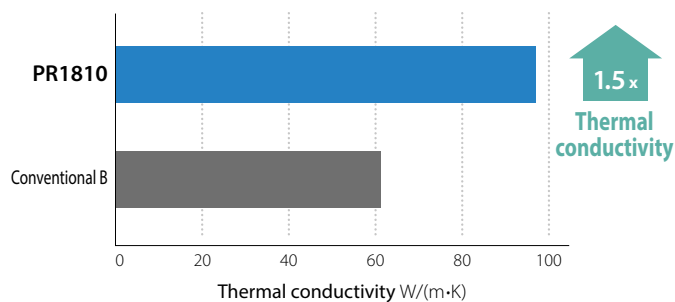
Uses a proprietary base material with excellent thermal conductivity.  
Achieving stable processing of cast iron

**Carbide Substrate**



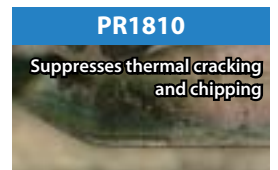
Coarse fine granules      Fine grain

**Thermal conductivity comparison** (Internal evaluation)



**Cutting edge condition** (Internal evaluation)

After about 60 min machining



Cutting Conditions :  
Vc = 200 m/min  
ap x ae = 2 x 85 mm  
fz = 0.2 mm/t  
FCD450, Wet  
PNMU1205ANER-GM (MFPN45)

PR1810 uses a mixture of coarse and fine grains. Improved thermal conductivity and reduced thermal cracking and chipping

## Product lineup

### PR18 series for various applications

#### 90° cutting edge angle type

Shouldering

Slotting

Facing

##### Double-sided inserts

Tangential 90° end mill  
with 4-edge Inserts

**MA90**



→P9



Original tangential 90° end mill  
with economical 4-edge inserts



90° end mill with double sided 4-edge inserts

**MEW**

→P9



90° helical end mill with double sided 4-edge inserts

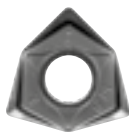
**MEWH**

→P9

Double-sided 6-edge inserts, low cutting force cutter

**MFWN**

→P13



Double-sided 6-edge inserts, low cutting force cutter

**MFWN Mini**

→P13



4-edge face mill with vertical inserts for heavy milling

**MFLN90**

→P15



Highly efficient cutter with a 88° cutting edge angle

**MFSN88** 88° cutting edge angle →P15



#### 90° cutting edge angle type

Shouldering

Slotting

Facing

##### Single-sided inserts

High-efficiency end mill

**MEC**

→P11



High-efficiency helical end mill

**MECH**

→P11



High-efficiency and low-cutting-force end mill

**MECX**

→P11



High-efficiency face mill for heavy milling

**MSRS90**

→P17



High-efficiency face mill for heavy milling

**MSR**

→P17



## 45° cutting edge angle type

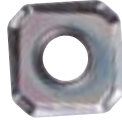
Facing

New 45° general purpose cutter

**MB45**



→P19



Delivers the "low cutting force" benefits of positive inserts and the "fracture resistance" benefits of negative inserts. Excellent surface finish



45° face mill with double sided 10-edge inserts

**MFPN45**

→P19



High precision and high efficiency high rake cutter

**MFSE45**

→P21



Highly efficient cutter with a 66° cutting edge angle

**MFPN66**

66° cutting edge angle

→P21



## 45°/70°/75° cutting edge angle type

Facing

4-edge face mill with vertical inserts for heavy milling

**MFLN45/MFLN70**

→P23



High-efficiency face mill for heavy milling

**MSRS15**

75° cutting edge angle

→P23



High efficiency multi-edge cutter for cast iron

**MFK**

70° cutting edge angle

→P23



## High feed cutter

Shouldering

Slotting

Pocketing

Facing

High efficiency and high feed cutter

**MFH Series**

→P25-28

High feed and large depth of cut milling

**MFH Boost**



Micro dia. cutter for high feed machining

**MFH Micro**



Small dia. cutter for high feed machining

**MFH Mini**



Highly efficiency and high feed cutter

**MFH Harrier**



## Radius cutter

Shouldering

Pocketing

Facing

High-efficiency radius cutter with multiple edges

**MRW**

→P29



Low-cutting-force and high-efficiency radius cutter

**MRX**

→P29



## Others

Multi-function end mill

**MEY**

→P31



Chamfering end mill

**MCSE**

→P31



Bolt countersink end mill

**MEF**

→P31



T-slot mill

**METS**

→P31



A lineup of milling insert supporting ISO standard is available.

90° cutting edge angle type

Shouldering

Slotting

Facing

Tangential 90° end mill with 4-edge inserts

# MA90

**NEW**

Original tangential 90° end mill with economical 4-edge inserts









90° end mill with double sided 4-edge inserts

# MEW/MEWH




Reduces cutting force equivalent to positive inserts  
Excellent surface finish



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose (G-Class)	LOGU 090404ER-GM	●	●	●
	090408ER-GM	●	●	●
	090412ER-GM	●	●	●
	090416ER-GM	●	●	●
 Low cutting force (G-Class)	LOGU 090404ER-SM	●	●	-
	090408ER-SM	●	●	-
	090412ER-SM	●	●	-
	090416ER-SM	●	●	-
 Tough edge (G-class)	LOGU 090408ER-GH	●	●	●
 General purpose (G-Class)	LOGU 120604ER-GM	●	●	●
	120608ER-GM	●	●	●
	120612ER-GM	●	●	●
	120616ER-GM	●	●	●
	120620ER-GM	●	●	●
	120624ER-GM	●	●	●
	120630ER-GM	●	●	●
 Low cutting force (G-Class)	LOGU 120604ER-SM	●	●	-
	120608ER-SM	●	●	-
	120612ER-SM	●	●	-
	120616ER-SM	●	●	-
	120620ER-SM	●	●	-
	120624ER-SM	●	●	-
 Tough edge (G-class)	LOGU 120608ER-GH	●	●	●

Right-handed insert shown

● : Available

Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	LOMU 100404ER-GM	●	●	●
	100408ER-GM	●	●	●
	100412ER-GM	●	●	●
	100416ER-GM	●	●	●
	100420ER-GM	●	●	●
	LOMU 150504ER-GM	●	●	●
	150508ER-GM	●	●	●
	150510ER-GM	●	-	-
	150512ER-GM	●	●	●
	150516ER-GM	●	●	●
 Low cutting force	LOMU 100408ER-SM	●	●	●
	LOMU 150508ER-SM	●	●	●
 Tough edge (for heavy cutting)	LOMU 100408ER-GH	●	●	●
	LOMU 150508ER-GH	●	●	●

Right-handed insert shown

● : Available

# MA90

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	★ 100 – <b>160</b> – 200	☆ 100 – <b>160</b> – 200	–
Martensitic stainless steel	–	☆ 150 – <b>200</b> – 250 <sup>*1</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	★ 20 – <b>30</b> – 50	–
Titanium alloy (Ti-6Al-4V)	–	☆ 20 – <b>50</b> – 70 <sup>*2</sup>	–

\*1 CA6535: 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*2 PR1835 (Low Cutting Force) : 1st Recommendation for Titanium alloy (Ti-6Al-4V)

# MEW/MEWH

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	★ 100 – <b>160</b> – 200	☆ 100 – <b>160</b> – 200	–
Martensitic stainless steel	–	☆ 150 – <b>200</b> – 250 <sup>*1</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	☆ 20 – <b>30</b> – 50 <sup>*2</sup>	–
Titanium alloy (Ti-6Al-4V)	–	☆ 30 – <b>50</b> – 70 <sup>*3</sup>	30 – <b>50</b> – 70

\*1 CA6535: 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*2 PR1535 : 1st Recommendation for Ni-based heat resistant alloys

\*3 PR1535 : 1st Recommendation for Titanium alloy (Ti-6Al-4V)

90° cutting edge angle type

Shouldering

Slotting


Facing

High-efficiency end mill

# MEC

Excellent surface finish with low cutting forces  
Large lineup for various applications



Shape	Description	MEGACOAT NANO EX			
		PR1825	PR1835	PR1810	
	BDMT	110302ER-JT	●	●	●
		110304ER-JT	●	●	●
		110308ER-JT	●	●	●
	BDMT	11T302ER-JT	●	●	●
		11T304ER-JT	●	●	●
		11T308ER-JT	●	●	●
		11T312ER-JT	●	●	●
		11T316ER-JT	●	●	●
		11T320ER-JT	●	●	●
		11T324ER-JT	●	●	●
		11T331ER-JT	●	●	●
	BDMT	170404ER-JT	●	●	●
		170408ER-JT	●	●	●
		170412ER-JT	●	●	●
		170416ER-JT	●	●	●
		170420ER-JT	●	●	●
170424ER-JT		●	●	●	
170431ER-JT		●	●	●	
170440ER-JT	●	●	●		
BDMT	110302ER-JS	●	●	-	
	110304ER-JS	●	●	-	
	110308ER-JS	●	●	-	
	BDMT	11T302ER-JS	●	●	-
		11T304ER-JS	●	●	-
		11T308ER-JS	●	●	-
	BDMT	170404ER-JS	●	●	-
		170408ER-JS	●	●	-

Right-handed insert shown

● : Available





Low cutting force/  
for stainless steel

High-efficiency end mill

# MECH

Notched inserts reduce chattering  
High efficiency heavy machining with large D.O.C.



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 2-Notched	BDMT 11T308ER-N2	●	●	●
 3-Notched	BDMT 11T308ER-N3	●	●	●
 3-Notched	BDMT 170408ER-N3	●	●	●
 4-Notched	BDMT 170408ER-N4	●	●	●



Right-handed insert shown

● : Available

High-efficiency end mill

# MECX

High-efficiency machining with fine pitch styles  
Compatible with low-rigidity facilities

Shape	Description	MEGACOAT NANO EX			
		PR1825	PR1835	PR1810	
	BDMT	070302ER-JT	●	●	●
		070304ER-JT	●	●	●
		070308ER-JT	●	●	●
 Low cutting force/ for stainless steel	BDMT	070302ER-JS	●	●	-
		070304ER-JS	●	●	-
		070308ER-JS	●	●	-

Right-handed insert shown

● : Available

# MEC

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	★ 100 – <b>160</b> – 200	☆ 100 – <b>160</b> – 200	–
Martensitic stainless steel	–	150 – <b>200</b> – 250 <sup>*1</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	20 – <b>30</b> – 50 <sup>*2</sup>	–
Titanium alloy (Ti -6Al -4 V)	–	40 – <b>60</b> – 80	30 – <b>50</b> – 70

\*1 CA6535: 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*2 PR1535 : 1st Recommendation fo Ni-based heat resistant alloys

# MECH

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Titanium alloy (Ti -6Al -4 V)	–	40 – <b>60</b> – 80	30 – <b>50</b> – 70




\*1 PR1535 : 1st Recommendation for Titanium alloy (Ti-6Al-4V)

Double-sided 6-edge insert, low cutting force cutter

# MFWN Mini

MFWN's superior performance remains intact  
Economical small diameter milling cutter



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	WNMU 050408EN-GM	●	●	●
 Low cutting force	WNMU 050408EN-SM	●	●	●
 Tough edge (for heavy cutting)	WNMU 050408EN-GH	●	●	●





● : Available

Double-sided 6-edge Insert, Low Cutting Force Cutter

# MFWN

Economical double-sided 6-edge insert  
Superior fracture resistance due to thick edge design



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 Surface finish oriented (Precision class)	WNEU 080608EN-GL	●	●	●
 Tough edge (for heavy cutting)	WNMU 080608EN-GH	●	●	●
 General purpose	WNMU 080604EN-GM	●	●	●
	080608EN-GM	●	●	●
 Low cutting force	WNMU 080608EN-SM	●	●	●

● : Available

# MFWN Mini

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	★ 100 – <b>160</b> – 200	☆ 100 – <b>160</b> – 200	–
Martensitic stainless steel	–	☆ 150 – <b>200</b> – 250	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	20 – <b>30</b> – 50 <sup>*1</sup>	–

\*1 PR1535(Low Cutting Force) : 1st Recommendation for Ni-based heat resistant alloys

# MFWN

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	★ 100 – <b>160</b> – 200	☆ 100 – <b>160</b> – 200	–
Martensitic stainless steel	–	☆ 150 – <b>200</b> – 250 <sup>*1</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	20 – <b>30</b> – 50 <sup>*2</sup>	–

\*1 CA6535(Low Cutting Force): 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*2 PR1535 : 1st Recommendation for Ni-based heat resistant alloys

90° cutting edge angle type

Shouldering

Slotting

Facing




Highly efficient cutter with a 88° cutting edge angle

# MFSN88

88° cutting edge angle

Economical inserts with 8 cutting edges. Reduces chattering with low cutting force design. Suitable for shoulder roughing



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	SNMU 130508EN-GM	●	●	●
 Low cutting force	SNMU 130508EN-SM	●	●	●
 Tough edge (for heavy cutting)	SNMU 130508EN-GH	●	●	●



●: Available

4-edge face mill with vertical inserts for heavy milling

# MFLN90

Tough and reliable 4-edge vertical inserts for large D.O.C. and high feed machining. Stable heavy milling



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 Corner-R	LOGU 221616ER-GM	●	●	–
 Corner chamfer	LOGU 2216PAER-GM	●	●	–

●: Available

# MFSN88

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon Steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy Steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	100 – <b>150</b> – 200	100 – <b>160</b> – 200 <sup>*1</sup>	–
Martensitic stainless steel	–	150 – <b>200</b> – 250 <sup>*2</sup>	–
Precipitation hardening stainless steel	–	★ 90 – <b>120</b> – 150	–
Gray cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	20 – <b>30</b> – 50 <sup>*3</sup>	–

\*1 PR1535(Low Cutting Force): 1st Recommendation for Austenitic stainless steel(SUS 304, etc.)

\*2 PR1535(Low Cutting Force): 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*3 PR1535(Low Cutting Force) : 1st Recommendation for Ni-based heat resistant alloys

# MFLN90

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon Steel	★ 120 – <b>150</b> – 180	☆ 80 – <b>120</b> – 150	–
Alloy Steel	★ 100 – <b>150</b> – 180	☆ 80 – <b>120</b> – 150	–
Mold steel	★ 80 – <b>120</b> – 150	☆ 70 – <b>100</b> – 120	–
Gray cast iron	★ 100 – <b>150</b> – 180	☆ 80 – <b>120</b> – 150	–
Ductile cast iron	★ 100 – <b>150</b> – 180	☆ 80 – <b>120</b> – 150	–

High-efficiency face mill for heavy milling

# MSRS90

Face mill for heavy milling. Notched insert reduced cutting force when entering the workpiece








High-efficiency face mill for heavy milling





# MSR

High-efficiency notched inserts provide low cutting force and suppress chattering. Improves machining efficiency in heavy milling with larger depth of cut.



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 3-notched	SPMT 180616EN-NB3	-	●	●
 3-notched/ Low cutting force	SPMT 180616EN-NB3P	-	●	●
 4-notched	SPMT 180616EN-NB4	-	●	●
 4-notched/ Low cutting force	SPMT 180616EN-NB4P	-	●	●
 Without notch	SPMT 180616EN-V	-	●	●

●: Available

Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 3-Notched	APMT 250608ER-NB3	-	●	●
	250616ER-NB3	-	●	●
	250640ER-NB3	-	●	-
 4-Notched	APMT 250616EL-NB3	-	●	-
	APMT 250608ER-NB4	-	●	●
	250616ER-NB4	-	●	●
 4-Notched/ Low cutting force	250640ER-NB4	-	●	-
	APMT 250616EL-NB4	-	●	-
 3-Notched/ Low cutting force	APMT 250616ER-NB3P	-	●	●
	APMT 250616ER-NB4P	-	●	●

●: Available

# MSRS90

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon Steel	–	★ 100 – 150 – 200	☆ 100 – 150 – 200
Alloy Steel	–	★ 100 – 150 – 200	☆ 100 – 150 – 200
Mold steel	–	★ 100 – 150 – 180	☆ 100 – 150 – 180
Gray cast iron	–	☆ 100 – 180 – 250	★ 100 – 150 – 250
Ductile cast iron	–	☆ 100 – 180 – 220	★ 100 – 150 – 250

# MSR

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon Steel	–	★ 100 – 150 – 200	–
Alloy Steel	–	–	–
Mold steel	–	–	–
Gray cast iron	–	–	★ 100 – 150 – 200
Ductile cast iron	–	–	★ 100 – 150 – 200

## 45° cutting edge angle type

## Facing





45° cutting edge angle - New general purpose cutter

# MB45

NEW

Delivers the "low cutting force" benefits of positive inserts and the "fracture resistance" benefits of negative inserts. Excellent surface finish



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	SNMU 1406ANER-GM	●	●	●
 Tough edge	SNMU 1406ANER-GH	●	●	●
 General purpose	SNEU 1406ANER-GM	●	●	●
 Low cutting force	SNEU 1406ANER-SM	●	●	-

Right-handed insert shown








●: Available

45° face mill with double-sided 10-edge inserts

# MFPN45

Reduced chattering with low cutting force design and excellent fracture resistance. Economical 10-edge insert



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	PNMU 1205ANER-GM	●	●	●
 General purpose	PNMU 1205ANER-GH	●	●	●
 Low cutting force	PNMU 1205ANER-SM	●	●	●
 Tough edge (for Heavy Cutting)	PNMU 1205ANER-GH	●	●	●
 Surface finish oriented (Precision class)	PNEU 1205ANER-GL	●	●	●
 Surface finish oriented (Precision class)	PNEU 1205ANER-GL	●	●	●
 Wiper insert (2-edge)	PNEU 1205ANER-W	●	●	●

●: Available

# MB45

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	☆ 100 – <b>160</b> – 200	☆ 100 – <b>160</b> – 200 <sup>*1</sup>	–
Martensitic stainless steel	–	☆ 150 – <b>200</b> – 250 <sup>*2</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	☆ 20 – <b>30</b> – 50 <sup>*3</sup>	–

\*1 PR1835(Low Cutting Force) : 1st Recommendation for Austenitic stainless steel(SUS 304, etc.)

\*2 CA6535(Low Cutting Force) : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*3 CA6535 : 1st Recommendation for Ni-based heat resistant alloys

# MFPN45

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	☆ 100 – <b>160</b> – 200	☆ 100 – <b>160</b> – 200 <sup>*1</sup>	–
Martensitic stainless steel	–	☆ 150 – <b>200</b> – 250 <sup>*2</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	☆ 20 – <b>30</b> – 50 <sup>*3</sup>	–

\*1 PR1535(Low Cutting Force) : 1st Recommendation for Austenitic stainless steel(SUS 304, etc.)

\*2 CA6535(Low Cutting Force) : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*3 PR1535 : 1st Recommendation for Ni-based heat resistant alloys




Highly efficient cutter with a 66° cutting edge angle

# MFPN66

66° cutting edge angle

Economical 10-edge insert. Reduces cutting costs when machining auto parts and other general purpose machining applications



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	PNMU 0905XNER-GM	●	●	●
 Low cutting force	PNMU 0905XNER-SM	●	●	●
 Tough edge (for heavy cutting)	PNMU 0905XNER-GH	●	●	●

Right-handed insert shown



●: Available

High Precision and High Efficiency High Rake Cutter

# MFSE45

Rough and finish in 1 pass with excellent surface finish



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	SEET 13T3AGSN-GL	●	●	—
 Stainless steel	SEET 13T3AGSN-SL	●	●	—

●: Available

# MFPN66

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	☆ 100 – <b>150</b> – 200	☆ 100 – <b>150</b> – 200 <sup>*1</sup>	–
Martensitic stainless steel	–	☆ 100 – <b>150</b> – 200 <sup>*2</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	☆ 20 – <b>30</b> – 50 <sup>*3</sup>	–
Titanium alloy (Ti -6Al -4V)	–	–	–

\*1 PR1535(Low Cutting Force) : 1st Recommendation for Austenitic stainless steel(SUS 304, etc.)

\*2 PR1535(Low Cutting Force) : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*3 PR1535(Low Cutting Force) : 1st Recommendation for Ni-based heat resistant alloys

# MFSE45

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	☆ 150 – <b>200</b> – 300	★ 150 – <b>200</b> – 300	–
Alloy steel	☆ 150 – <b>200</b> – 300	★ 150 – <b>200</b> – 300	–
Mold steel	★ 100 – <b>150</b> – 250	☆ 100 – <b>150</b> – 250	–
Austenitic stainless steel	☆ 100 – <b>200</b> – 250	★ 100 – <b>200</b> – 250	–
Martensitic stainless steel	☆ 100 – <b>200</b> – 250	★ 100 – <b>200</b> – 250	–
Precipitation hardened stainless steel	–	–	–
Grey cast iron	100 – <b>200</b> – 250	100 – <b>200</b> – 250	–
Ductile cast iron	☆ 100 – <b>200</b> – 250	☆ 100 – <b>200</b> – 250	–
Ni-based heat resistant alloys	–	–	–
Titanium alloy (Ti -6Al -4V)	–	–	–

## 45°/70°/75° cutting edge angle type

## Facing








High-efficiency face mill for heavy milling

# MSRS15

75° cutting edge angle

Large depth of cut and high feed machining provide high efficiency machining. Max. D.O.C. is 12 mm



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 2-notched	SPMT 1806EDER-NB2	●	●	●
 3-notched	SPMT 1806EDER-NB3	●	●	●
 4-notched/ Low cutting force	SPMT 1806EDER-NB2P	●	●	●
 5-notched/ Low cutting force	SPMT 1806EDER-NB3P	●	●	●
 2-notched/Tough edge	SPMT 1806EDSR-NB2T	-	●	●
 3-notched/Tough edge	SPMT 1806EDSR-NB3T	-	●	●
 Without notch	SPMT 1806EDER-V	●	●	●


●: Available

4-edge face mill with vertical inserts for heavy milling

# MFLN45/MFLN70

Tough and reliable 4-edge vertical inserts for large D.O.C. and high feed machining. Stable heavy milling



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 Corner-R	LOGU 221616ER-GM	●	●	-

●: Available

High efficiency multi-edge cutter for cast iron

# MFK

70° cutting edge angle

Multi-edge cutter provides high efficiency in cast iron machining. Economical inserts with 10 cutting edges



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	PNMG 1106XNEN-GM	●	-	●
 Tough edge	PNMG 1106XNEN-GH	●	-	●
 Surface Finish Oriented	PNEG 1106XNEN-GL	●	-	●
 Wiper Insert (2-edge)	PNEG 1106XNER-W	●	-	●

●: Available

# MSRS15

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	☆ 120 – <b>180</b> – 250	★ 120 – <b>180</b> – 220	–
Alloy steel	☆ 120 – <b>180</b> – 250	★ 120 – <b>180</b> – 220	–
Mold steel	☆ 100 – <b>160</b> – 220	★ 100 – <b>160</b> – 220	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>160</b> – 200

# MFLN45/MFLN70

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 100 – <b>150</b> – 180	☆ 80 – <b>120</b> – 150	–
Alloy steel	★ 100 – <b>150</b> – 180	☆ 80 – <b>120</b> – 150	–
Mold steel	★ 80 – <b>120</b> – 150	☆ 70 – <b>100</b> – 120	–
Grey cast iron	★ 100 – <b>150</b> – 180	☆ 80 – <b>120</b> – 150	–
Ductile cast iron	★ 100 – <b>150</b> – 180	☆ 80 – <b>120</b> – 150	–

# MFK

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation


Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Grey cast iron	☆ 120 – <b>180</b> – 250	–	★ 120 – <b>180</b> – 250
Ductile cast iron	☆ 100 – <b>150</b> – 200	–	★ 100 – <b>150</b> – 200

High feed and large depth of cut milling

## MFH Boost

High feed milling with larger depths of cut. Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials, and molds



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	LOMU 040410ER-GM	●	●	●

Right-handed insert shown


●: Available

Micro dia. cutter for high feed machining (Cutter dia. ø8 – ø16)

## MFH Micro

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



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	LPGT 010210ER-GM	●	●	-

Right-handed insert shown

●: Available

# MFH Boost

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>160</b> – 220	☆ 120 – <b>160</b> – 220	–
Alloy steel	★ 100 – <b>150</b> – 200	☆ 100 – <b>150</b> – 200	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Mold steel	★ 60 – <b>100</b> – 130	–	–
Mold steel	★ 50 – <b>70</b> – 100	–	–
Austenitic stainless steel	☆ 100 – <b>140</b> – 180	★ 100 – <b>140</b> – 180	–
Martensitic stainless steel	–	☆ 100 – <b>150</b> – 200 <sup>*1</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>160</b> – 220
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	☆ 20 – <b>30</b> – 50 <sup>*2</sup>	–
Titanium alloy (Ti-6Al-4V)	–	★ 40 – <b>60</b> – 80	–

\*1 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*2 CA6535 : 1st Recommendation fo Ni-based heat resistant alloys

# MFH Micro

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel <sup>*1</sup>	80 – <b>140</b> – 180	80 – <b>140</b> – 180	–
Mold steel <sup>*1</sup>	60 – <b>100</b> – 130	–	–
Mold steel <sup>*1</sup>	50 – <b>70</b> – 100	–	–
Austenitic stainless steel	100 – <b>160</b> – 200	100 – <b>160</b> – 200 <sup>*2</sup>	–
Martensitic stainless steel	–	150 – <b>200</b> – 250 <sup>*3</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	–
Ductile cast iron	–	–	–
Ni-based heat resistant alloys	–	20 – <b>30</b> – 50 <sup>*4</sup>	–
Titanium alloy (Ti-6Al-4V)	–	★ 40 – <b>60</b> – 80	–

\*1 PR1525 : 1st Recommendation for Mold steel

\*2 PR1535 : 1st Recommendation for Austenitic stainless steel (SUS 304, etc.)

\*3 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)



\*4 CA6535 : 1st Recommendation for Ni-based heat resistant alloys

Small dia. cutter for high feed machining (Cutter dia.  $\phi 16 - \phi 50$ )

## MFH Mini

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



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	LOGU 030310ER-GM	●	●	●
 Tough edge	LOGU 030310ER-GH	●	●	●

Right-handed insert shown





●: Available

Highly efficiency and high feed cutter (Cutter dia.  $\phi 25 - \phi 160$ )

## MFH Harrier

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



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	SOMT 100420ER-GM	●	●	●
	140520ER-GM	●	●	●
 Large ap	SOMT 100420ER-LD	●	●	●
	140520ER-LD	●	●	●
 Wiper insert	SOMT 100420ER-FL	●	●	●
	140514ER-FL	●	●	●
 Tough edge	SOMT 100420ER-GH	●	●	●
	140520ER-GH	●	●	●

Right-handed insert shown

●: Available

# MFH Mini

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel*1	80 – <b>140</b> – 180	80 – <b>140</b> – 180	–
Mold steel*1	60 – <b>100</b> – 130	–	–
Mold steel*1	50 – <b>70</b> – 100	–	–
Austenitic stainless steel	100 – <b>160</b> – 200	100 – <b>160</b> – 200*2	–
Martensitic stainless steel	–	150 – <b>200</b> – 250*3	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	20 – <b>30</b> – 50*4	–
Titanium alloy (Ti-6Al-4V)	–	★ 40 – <b>60</b> – 80	☆ 30 – <b>50</b> – 70

\*1 PR0155 : 1st Recommendation for Mold steel

\*2 PR1535 : 1st Recommendation fo Austenitic stainless steel (SUS 304, etc.)

\*3 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*4 CA6535 : 1st Recommendation fo Ni-based heat resistant alloys

# MFH Harrier

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel*1	80 – <b>140</b> – 180	80 – <b>140</b> – 180	–
Mold steel*1	60 – <b>100</b> – 130	–	–
Mold steel*1	50 – <b>70</b> – 100	–	–
Austenitic stainless steel	100 – <b>160</b> – 200	100 – <b>160</b> – 200*2	–
Martensitic stainless steel	–	150 – <b>200</b> – 250*3	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	20 – <b>30</b> – 50*4	–
Titanium alloy (Ti-6Al-4V)	–	★ 40 – <b>60</b> – 80	☆ 30 – <b>50</b> – 70

\*1 PR0155 : 1st Recommendation for Mold steel

\*2 PR1535 (LD-Large ap) : 1st Recommendation fo Austenitic stainless steel (SUS 304, etc.)

\*3 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)

\*4 CA6535 : 1st Recommendation fo Ni-based heat resistant alloys

High-efficiency radius cutter with multiple edges

# MRW

Economical double-sided 8-edge Inserts. Excellent sharpness and cutting edge strength, suitable for a wide range of workpiece materials






Low-cutting-force and high-efficiency radius cutter

# MRX





Excellent cutting performance due to low cutting force design  
High-efficiency radius cutter



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	ROMU 1204MOER-GM	●	●	●
	1605MOER-GM	●	●	●
 Low cutting force	ROMU 1204MOER-SM	●	●	-
	1605MOER-SM	●	●	-
 Tough edge (for heavy milling)	ROMU 1204MOER-GH	●	●	●
	1605MOER-GH	●	●	●

Right-handed insert shown

● : Available

Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General purpose	RDGT 0803MOER-GM	●	●	●
	RPGT 10T3MOER-GM	●	●	●
	1204MOER-GM	●	●	●
	1605MOER-GM	●	●	●
 General purpose	RDMT 0803MOER-GM	●	●	●
	RPMT 10T3MOER-GM	●	●	●
	1204MOER-GM	●	●	●
	1605MOER-GM	●	●	●
 Low cutting force	RDGT 0803MOER-SM	●	●	-
	RPGT 10T3MOER-SM	●	●	-
	1204MOER-SM	●	●	-
	1605MOER-SM	●	●	-
 Tough edge (for heavy cutting)	RDMT 0803MOEN-GH	●	●	●
	RPMT 10T3MOEN-GH	●	●	●
	1204MOEN-GH	●	●	●
	1605MOEN-GH	●	●	●

Right-handed insert shown

● : Available

# MRW

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	☆ 100 – <b>160</b> – 200	★ 100 – <b>160</b> – 200	–
Martensitic stainless steel	–	150 – <b>200</b> – 250 <sup>*1</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	20 – <b>30</b> – 50 <sup>*2</sup>	–
Titanium alloy (Ti -6Al -4 V)	–	☆ 40 – <b>60</b> – 80	☆ 30 – <b>50</b> – 70

\*1 CA6535 : 1st Recommendation for Martensitic stainless steel ( SUS 403, etc. )

\*2 PR1535 : 1st Recommendation fo Ni-based heat resistant alloys

# MRX

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

Workpiece material	Recommended insert grade (Vc: m/min)		
	PR1825	PR1835	PR1810
Carbon steel	★ 120 – <b>180</b> – 250	☆ 120 – <b>180</b> – 250	–
Alloy steel	★ 100 – <b>160</b> – 220	☆ 100 – <b>160</b> – 220	–
Mold steel	★ 80 – <b>140</b> – 180	☆ 80 – <b>140</b> – 180	–
Austenitic stainless steel	☆ 100 – <b>160</b> – 200	★ 100 – <b>160</b> – 200	–
Martensitic stainless steel	–	150 – <b>200</b> – 250 <sup>*1</sup>	–
Precipitation hardened stainless steel	–	★ 90 – <b>120</b> – 150	–
Grey cast iron	–	–	★ 120 – <b>180</b> – 250
Ductile cast iron	–	–	★ 100 – <b>150</b> – 200
Ni-based heat resistant alloys	–	20 – <b>30</b> – 50 <sup>*2</sup>	–
Titanium alloy (Ti -6Al -4 V)	–	★ 40 – <b>60</b> – 80 <sup>*3</sup>	☆ 30 – <b>50</b> – 70

\*1 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)



\*2 CA6535 : 1st Recommendation for Ni-based heat resistant alloys

## Other inserts for milling

Multi-function end mill

### MEY

Multi-function machining (Drilling/Ramping/Shouldering/  
Grooving). Full 2-insert structure and high stability



Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
	GOMT 08T208ER-D	●	–	●
	100308ER-D	●	–	●
	13T308ER-D	●	–	●
	160408ER-D	●	–	●
	JOMT 08T208ER-D	●	–	●
	100308ER-D	●	–	●
	13T308ER-D	●	–	●
	160408ER-D	●	–	●

●: Available

Chamfering end mill

### MCSE

For 30°, 45°, 60° chamfering.  
Economical 4-edge insert

Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
	SDKW 09T204TN	●	–	–
	SEKW 120304TN	●	–	–
	120308TN	●	–	–
	SDMT 09T204C	●	–	–
	SEMT 120304C	●	–	–


Low cutting force

●: Available

Bolt countersink end mill

### MEF

Countersink for hexagon socket bolt (M6 ~ M30).  
Economical 4-edge insert


Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
	SPMT 060204E-Z	●	–	●
	060208E-Z	●	–	●
	090304E-Z	●	–	●
	090308E-Z	●	–	●

●: Available

T-Slot mill

### METS

For T-slotting. Recommended for high feed machining  
with 2 flute design. Economical 4-edge insert

Shape	Description	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
	SDMT 060304E-K	–	●	●
	080308E-K	–	●	●
	120408E-K	–	●	●

●: Available

## ISO standard inserts for milling

Description	MEGACOAT NANO EX		
	PR1825	PR1835	PR1810
SDMR 1203AUER-H	●	–	–
SEMR 1203AFER-H	●	–	–
SPEN 1203EESR	–	–	●
SPMR 1203EDER-H	●	–	–
TEMR 1603PTER-H	●	–	–
TEMR 2204PTER-H	●	–	–
TPMR 1603PDER-H	●	–	–
TPMR 2204PDER-H	●	–	–
RDHX 0702MOT	–	●	–
RDHX 1003MOT	–	●	–
RDHX 12T3MOT	–	●	–
RDMT 08T2M0-H	–	●	●
RPMT 10T3M0	–	●	●
RPMT 1204M0	–	●	●
RPMT 1204M0-H	–	●	●
RPMT 1606M0-H	–	●	●
RPMT 2006M0-H	–	●	●
SDMT 1204AESR-H	●	–	–

●: Available