High Efficiency and High Feed Cutter

MFH Series



Stable Machining with Greater Chatter Resistance

- Low cutting force with convex helical edge design
- Long tool life with various workpiece materials
- Compatible with small machining centers
- Introducing MFH Harrier-D with 8-edge, double sided insert NEW
- New grade PM335S for stable machining of titamium alloys NEW

Micro : P5, P14
Mini : P6, P17
Harrier : P7, P21
Harrier-D : P8, P29
Boost : P9, P33



High Efficiency and High Feed Cutter

MFH Series

Convex cutting edge design reduces chatter for high-efficiency rough machining
Large lineup from ø8 to ø160 for various applications

1 Resistant to chatter and achieves stable high-feed machining

KYOCERA's proprietary technology, the "Convex Cutting Edge Geometry," is implemented across the entire MFH series.

Reduces cutting force at initial impact and provides stable machining

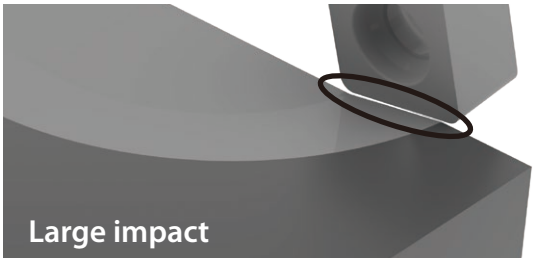


Initial contact with the workpiece (Image)

MFH series

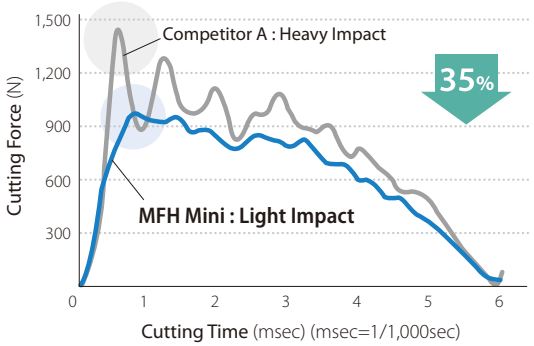


Conventional high feed cutter



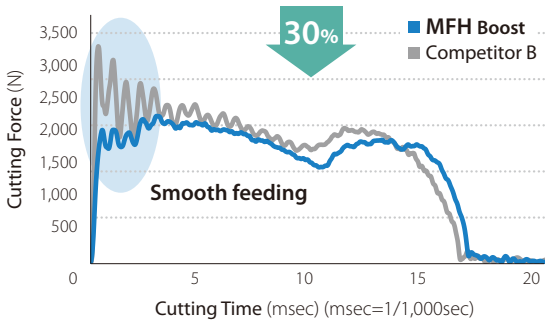
Cutting force when entering workpiece (Internal evaluation)

MFH Mini



Cutting Conditions: Vc = 150 m/min, ap × ae = 0.5 × 8 mm, fz = 1.0 mm/t, Dry
Cutter Dia. DC = ø16 (1 Insert) Workpiece: S50C

MFH Boost

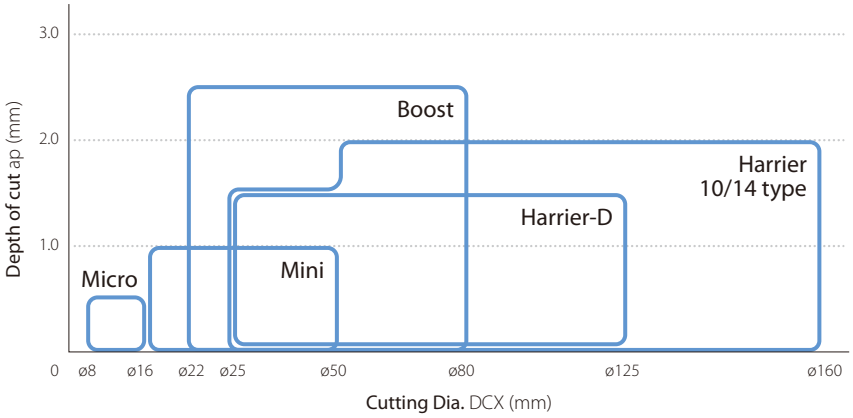


Cutting Conditions: Vc = 150 m/min, ap × ae = 2 × 25 mm, fz = 0.7 mm/t, Dry
Cutter Dia. DC = ø 50 (1 Insert) BT50 S50C

2 Large lineup for a wide range of applications

Introducing MFH Harrier-D with 8-edge, double-sided inserts NEW

Supports a wide range of applications



Harrier: LD insert supports up to ap = 5.0 mm

Lineup and applications

	Micro P5, P14	**Mini** P6, P17	**Harrier** P7, P21	**Harrier-D** P8, P29	**Boost** P9, P33
End mill	ø8-ø16	ø16-ø32	ø25-ø80	ø25-ø40	ø22-ø40
Face mill	-	ø40-ø50	ø50-ø160	ø50-ø125	ø40-ø80
Modular	ø8-ø16	ø16-ø32	ø25-ø40	ø25-ø40	ø22-ø42
Insert	2-edge, single-sided	4-edge, double-sided	4-edge, single-sided	8-edge, double-sided	4-edge, double-sided
Face milling / Shouldering	✓	✓	✓	✓	✓
Slotting	✓	✓	✓	✓	✓
Ramping	✓	✓	✓	-	✓
Helical milling	✓	✓	✓ (GM / GH) - (LD / FL)	-	✓
Pocketing	✓	✓	✓ (GM / GH) - (LD / FL)	-	✓
Contouring	✓	✓	✓ (GM / GH) △ (LD / FL)	✓	✓
Features	Extra small cutting dia. range of ø16 or less Can be used in place of solid end mills to reduce costs	Fine pitch for high efficiency Suitable for ø50 and smaller machining on small machining centers	Suitable for roughing with dia. ø50 or more Supports various applications with large insert lineup	Suitable for roughing with dia. ø50 or more Cost-efficient with 8-edge, double-sided inserts (Ramping is not recommended)	High efficiency with large depth of cut (Note the machine rigidity)

3 New PVD coating MEGACOAT NANO EX provides long tool life

Next-generation PVD coating for milling

NEW **PR18 Series**

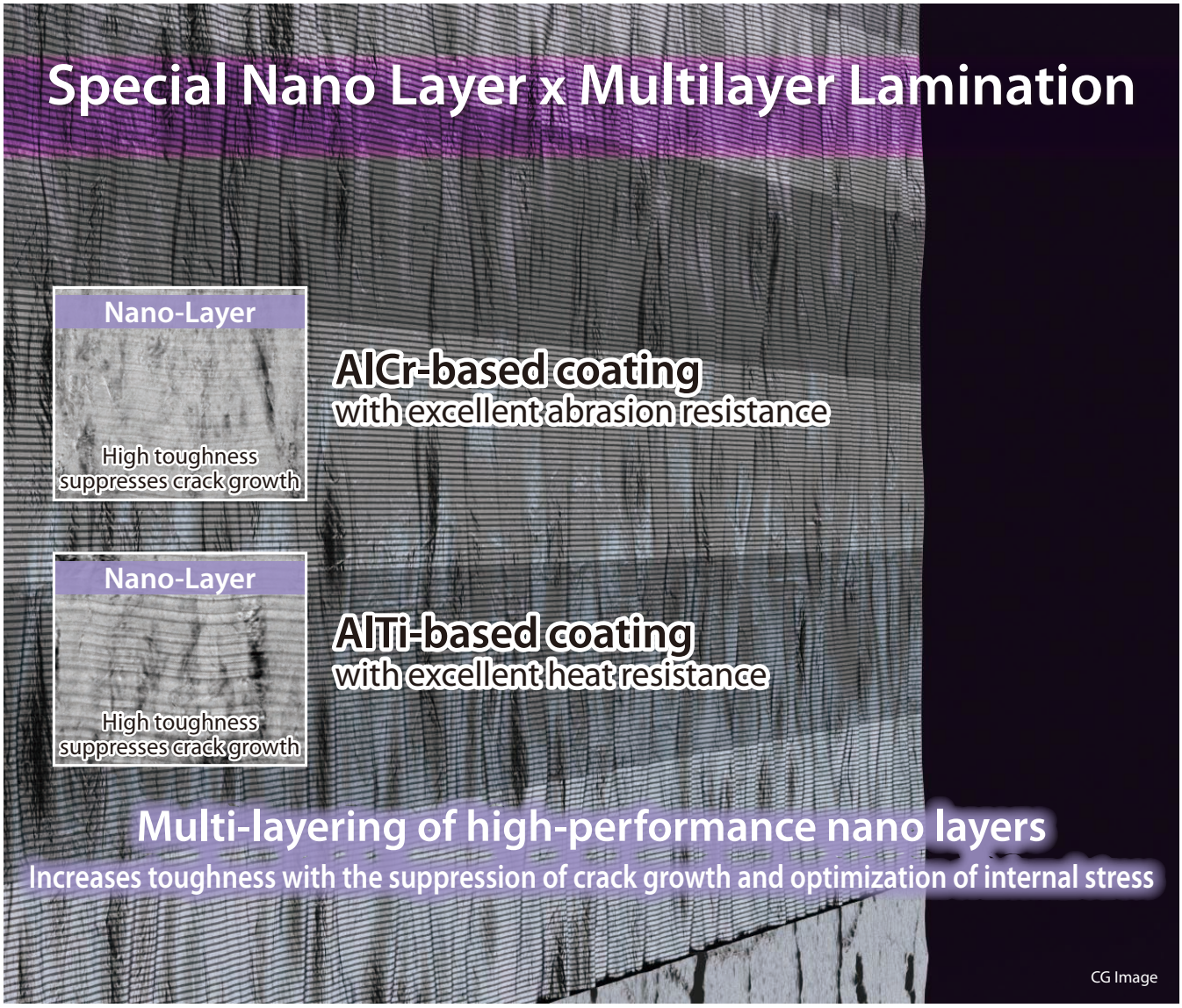
Double lamination technology with special nano layer
MEGACOAT NANO EX provides longer tool life
Features 3 grades: PR1825/PR1835/PR1810. Available for various machining environments

PR1825	P	for Steel (Wear resistance oriented)
PR1835	M	for Steel (Stability oriented) for Stainless Steel (1st recommendation)
PR1810	K	for Cast Iron

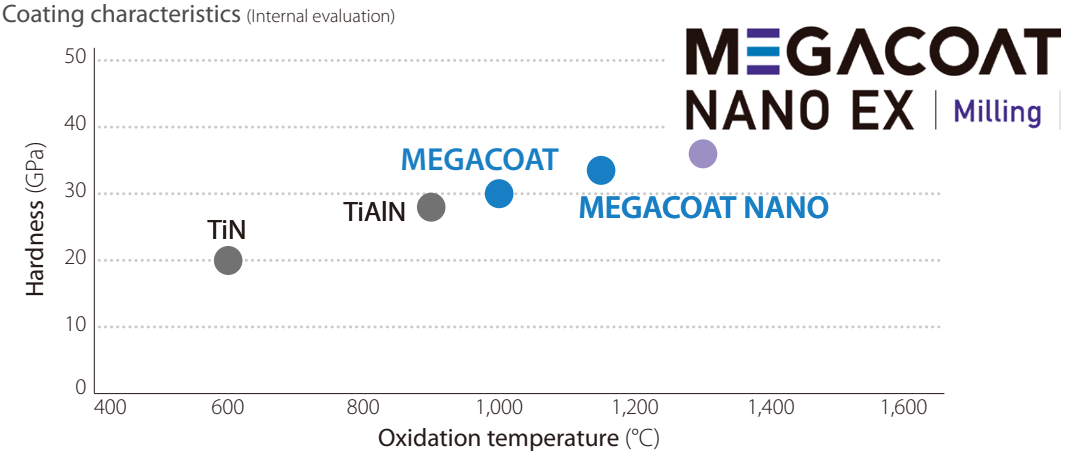
MEGACOAT NANO EX | Milling

Double Lamination Technology Maintains Longer Tool Life

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



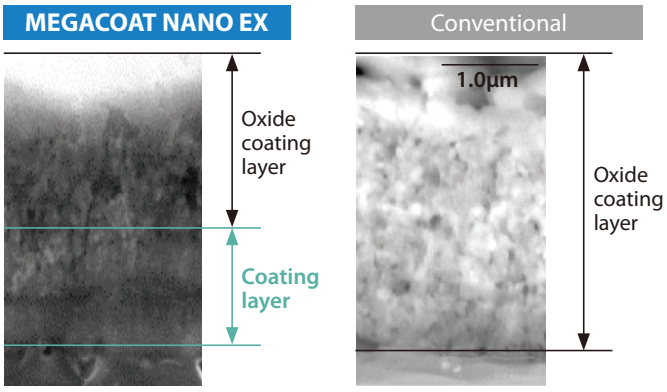
Coating characteristics (Internal evaluation)



Excellent oxidation resistance

Oxidation progression comparison (Internal evaluation)

Suppresses oxidation progression with excellent oxidation resistance

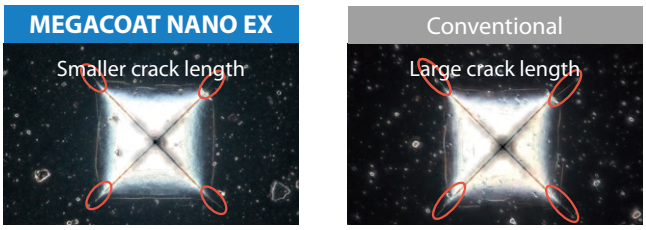


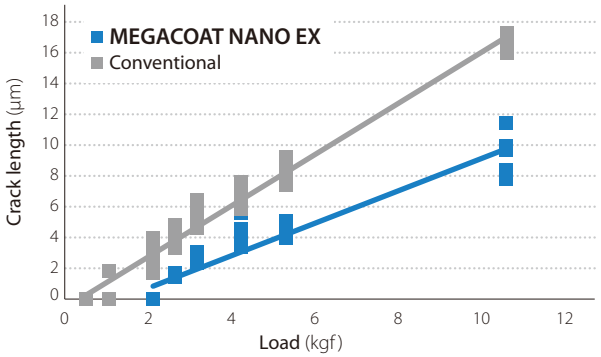
*Section after holding at 1,200 degrees for 30 minutes in air

High coating toughness

Coating layer toughness evaluation (Internal evaluation)

Excellent coating toughness with small crack length





*Micro-Vickers measurement

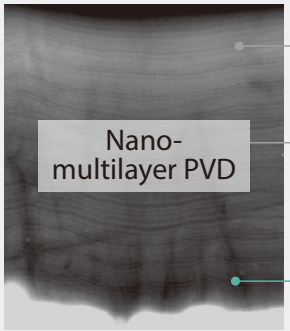
New grade for difficult-to-machine materials

NEW **PM335S**

S 1st recommendation for titanium alloy machining

High-adhesion, high-toughness coating improves resistance to chipping. Maintains high strength even at elevated cutting temperatures
Combined with a high-toughness carbide substrate, PM335S delivers stable machining and extended tool life in difficult-to-machine materials, including titanium alloys

Coating



MEGACOAT TOUGH

Utilizes AlCrN with superior resistance to adhesion

AlTiN-based / AlCrN nano-multilayer coating

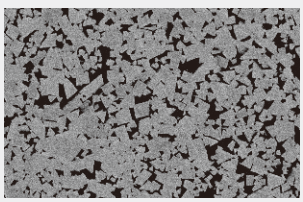
High hot hardness through high-melting-point element addition

Optimized compressive stress improves coating toughness

Special interface layer

Enhanced coating adhesion reduces the risk of coating delamination (Critical load increased by 15%)

Carbide substrate



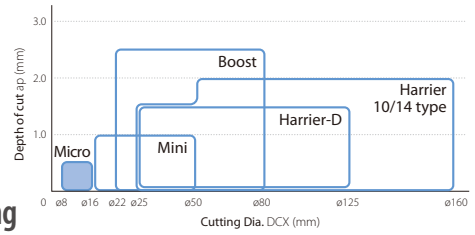
Utilizes a high-toughness carbide substrate

Delivers excellent fracture and wear resistance

Micro Dia. Cutter for High Feed Machining (Cutter Dia. ø8 – ø16)

MFH Micro





Low Resistance and Durable Against Chatter for Highly Efficient Machining

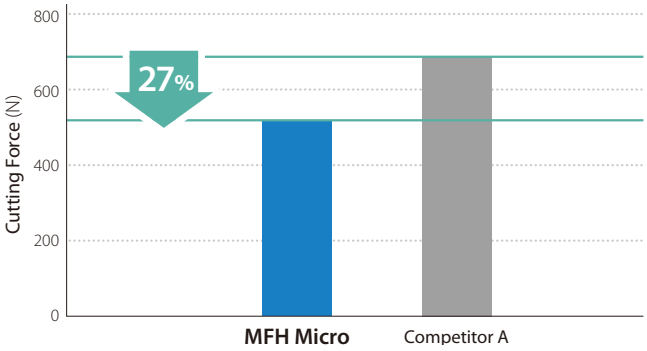
Maximum ap 0.5 mm. Stable High Feed Machining on a Wide Range of Applications

Description and recommended cutting conditions → P14

1 Low Resistance and Durable Against Chatter

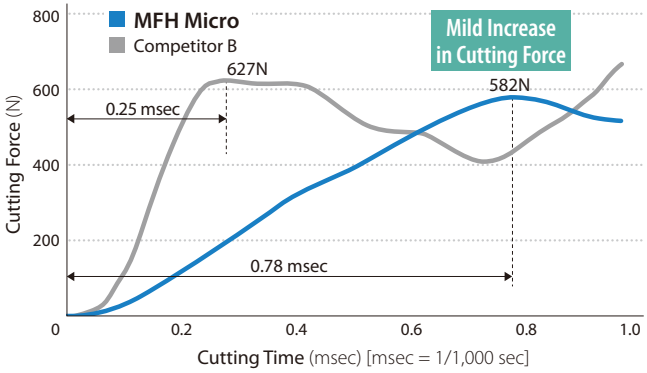
Molded Convex Cutting Edge Controls Initial Impact when Entering the Workpiece

Cutting Force Comparison (Internal Evaluation)



Cutting Conditions : Vc = 120 m/min, ap = 0.4 mm, fz = 0.6 mm/t
Cutter Dia. DC = ø10 (1 Insert), Slotting, Dry Workpiece: S50C

Cutting Force when Entering Workpiece Comparison (Internal Evaluation)



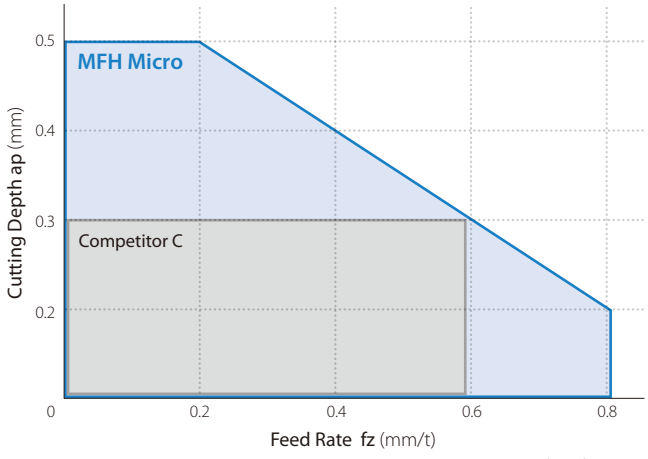
Cutting Conditions : Vc = 120 m/min, ap × ae = 0.4 × 5 mmt, fz = 0.6 mm/t
Cutter Dia. DC = ø10 (1 Insert), Dry Workpiece: S50C

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 Dia. ø10 mm)



(Internal Evaluation)

3 Replaces Solid End Mills to Reduce Machining Costs

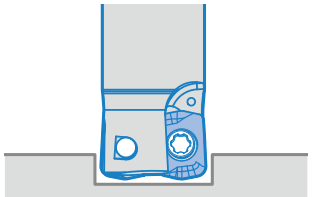
Suppresses Chattering and Increases Milling Efficiency

MFH Micro Compared to Solid End Mills (Mechanical Parts, Slotting, Workpiece S50C)

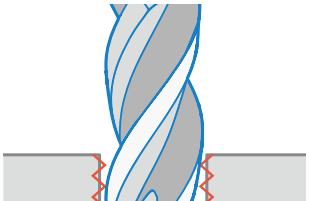
MFH Micro Q = 15.3 cc/min
Vc = 150 m/min, ap × ae = 0.4 × 10 mm
fz = 0.4 mm/t, Dry
MFH10-S10-01-2T (2 Inserts)
LPGT010210ER-GM

x 1.25 Efficiency

Solid End Mill Q = 12.2 cc/min
Vc = 80 m/min, ap × ae = 3 × 10 mm
fz = 0.04 mm/t, Dry
ø10 (4 Flutes)



Resists Chattering at High Feed Rates (fz = 0.4 mm/t)

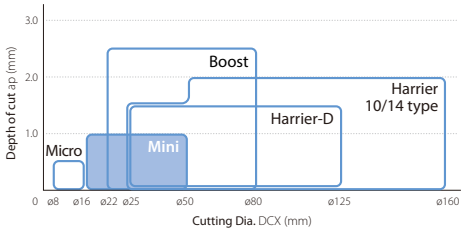


Subject to Chattering and Feed per Tooth Cannot Be Increased

Small Dia. Cutter for High Feed Machining (Cutter Dia. ø16 - ø50)

MFH Mini





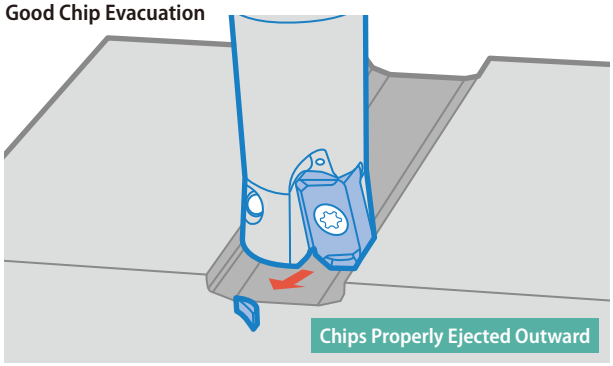
Economical Inserts with 4 Cutting Edges
Small Dia. Fine Pitch Type for High Efficiency and High Feed Machining

Description and recommended cutting conditions → P17

1 Good Chip Evacuation

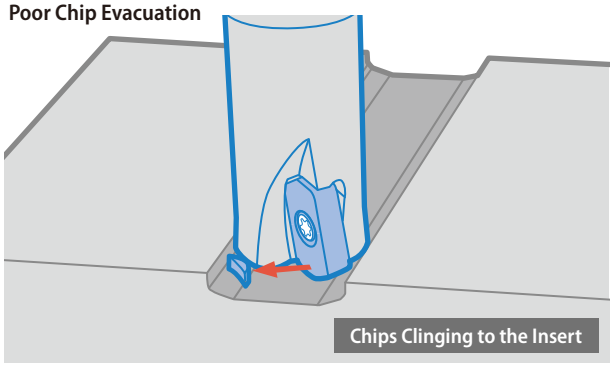
MFH Mini Controls Chip Biting with Convex Cutting Edge

MFH Mini





Competitor High Feed Cutter



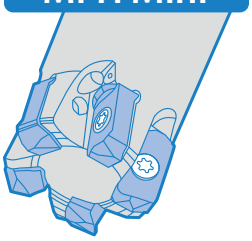


Cutting Conditions: Cutter Dia. DC = ø16 mm (2 Inserts), Vc = 150 m/min, ap = 0.5 mm (20pass), fz = 0.6 mm/t: Total 10 mm × 16 mm, Dry Workpiece: SS400 (Internal evaluation)

2 Fine Pitch for Efficient Machining

Cutter Dia. 25 mm Type

MFH Mini



5 Inserts MFH25-S25-03-5T

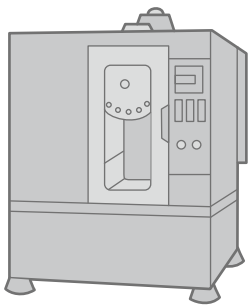
MFH Harrier



2 Inserts MFH25-S25-10-2T

3 Suitable for Roughing of Molds

High Feed Machining in Small Machining Centers



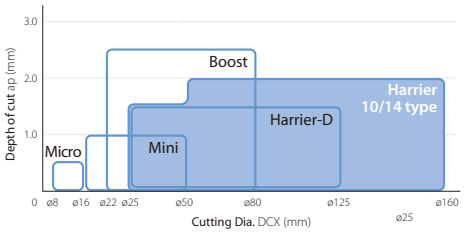
Applicable for BT30/ BT40

Highly Efficiency and High Feed Cutter (Cutter Dia. ø25 - ø160)

MFH Harrier



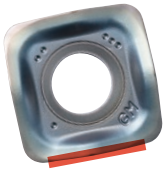
Wide Range of Products for High Feed Machining
Large Depths of Cut and Low Cutting Forces



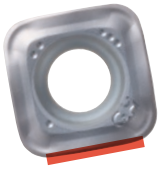
Description and recommended cutting conditions → P21

1 Large Insert Lineup for Various Applications

GM (General Purpose) / GH (Tough Edge)



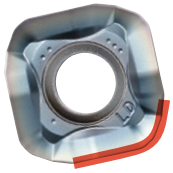
First Recommendation for General Machining



Excellent Fracture Resistance

Multiple Metalworking Processes.
Supports including Face Milling, Ramping, and Helical Milling

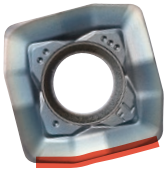
LP (Large ap)



MAX. ap = 5 mm

Available for Scale Removal as well as High Feed Cutting

FL (Wiper Edge)



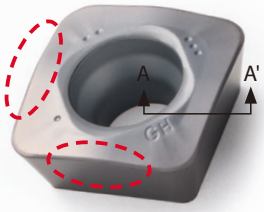
Wiper Edge with Low Cutting Forces

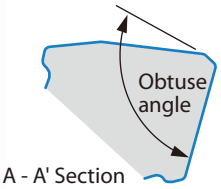
Excellent Surface Finish and Reduced Chattering

GH Chipbreaker with Excellent Fracture Resistance

Convex Cutting Edge Design

Reduces cutting force when entering workpiece
Surpresses chattering and fracturing





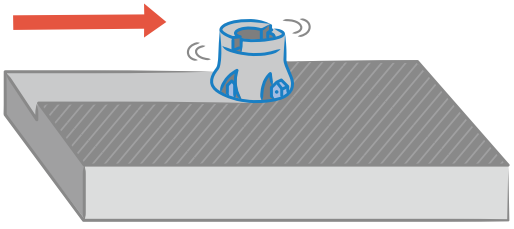
A - A' Section

Tough Edge Design

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

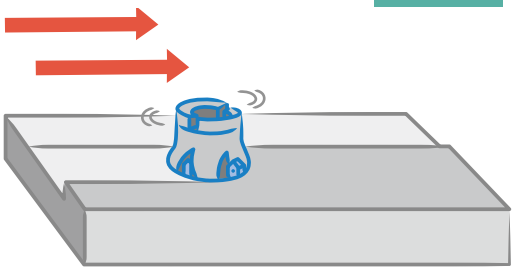
2 LD Chipbreaker Can Be Used for Both Large ap and High Feed Machining

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

Roughing (2 Passes) After Scale Removal: High Feed Rate
Vc = 200 m/min, ap × ae = 2 × 40 mm
fz = 1.5 mm/t, 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, ap × ae = 3 × 40 mm
fz = 0.25 mm/t, Vf = 1,264 mm/min
Workpiece : SS400

Chip Evacuation

MFH **404** cc/min

Conventional Cutter **151** cc/min

Efficiency x2.6

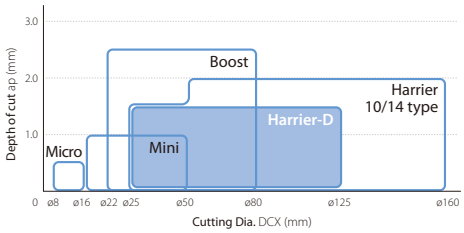
Large Dia. Cutter with Double-sided Insert (Cutter Dia. ø25 - ø125)

NEW

MFH Harrier-D



Cost-efficient with 8-edge, double-sided inserts
High efficiency face milling

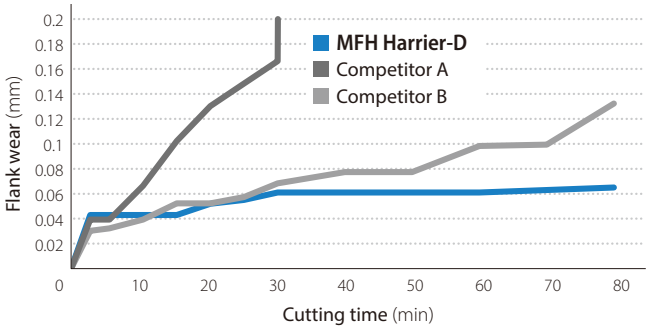


Description and recommended cutting conditions → P29

1 Double-sided, 8-edge design for economy. Long tool life reduces overall machining costs



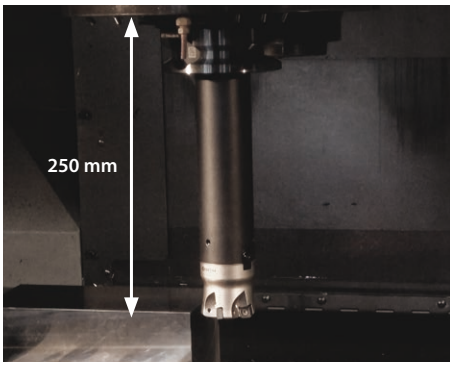
Wear resistance comparison (Internal evaluation)



Vc = 180 m/min, ap × ae = 1 × 37.7 mm, fz = 1.0 mm/t
ø50 SCM440HT Dry

2 Low cutting force and excellent chatter resistance

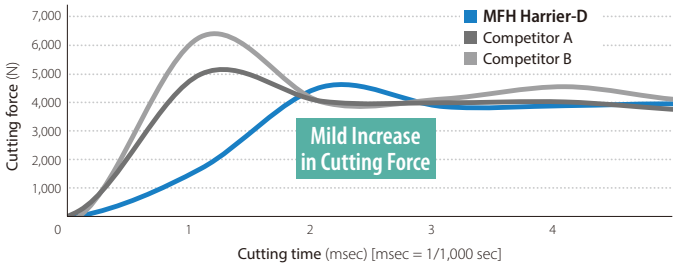
Achieves stable machining without chatter even with long overhang



Video

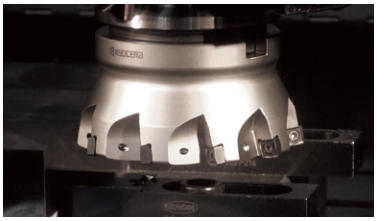
Low cutting force with convex helical edge design

Cutting Force and Vibration when Approaching the Workpiece
(ap: Half of Cutter Diameter) (Internal evaluation)



Vc = 150 m/min, ap × ae = 1.5 × 25 mm, fz = 1.5 mm/t, Dry ø50 (1 Insert) S50C

3 High-efficiency rough face milling



Vc = 180 m/min, ap = 1 mm,
fz = 1.0 mm/t, Dry, ø125 (10 Inserts) S50C

Efficiency simulation of face milling (Internal evaluation)

Roughing : MFH Harrier-D
Finishing : 45°Cutter



Vf = 4,600 mm/min

33% Cutting time

Roughing : 45°Cutter
Finishing : 45°Cutter



Vf = 1,400 mm/min

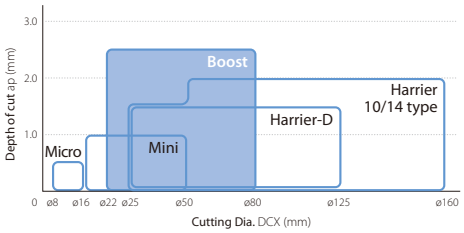
Improved roughing efficiency contributes to reduction in total cutting time

Description and recommended cutting conditions → P33

High Feed and Large Depth of Cut Milling

MFH Boost





Maximum D.O.C. of 2.5mm - High feed plus large D.O.C for greater milling capabilities

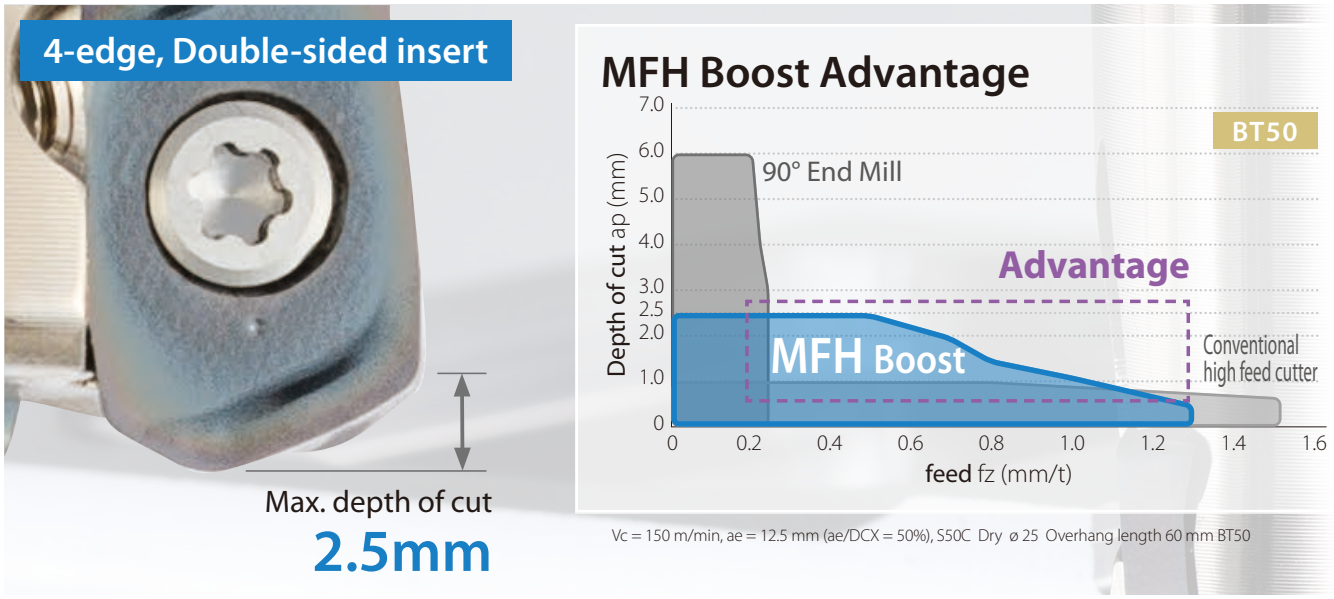
Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials and molds

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 2.5mm with cutting dia. available from ø22mm.

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



New value with 2.5mm max. depth of cut

Automotive parts

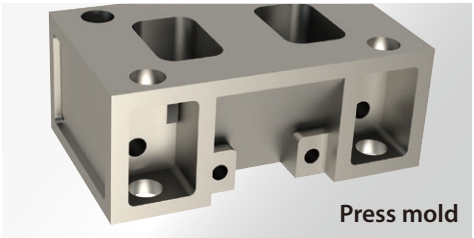
General Steel Machining



- **Increased productivity with high feed rates**
- **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. ø25mm: 3°)
  Dramatic efficiency improvement when ramping in pockets
- **Longer tool life with high-efficiency machining**

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

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 PR1835 Long tool Life and stable machining**

2 Available for a variety of machining applications and environments

1 Solutions for **90°end mills** (Roughing to medium-finishing)

High feed rates dramatically improve machining efficiency

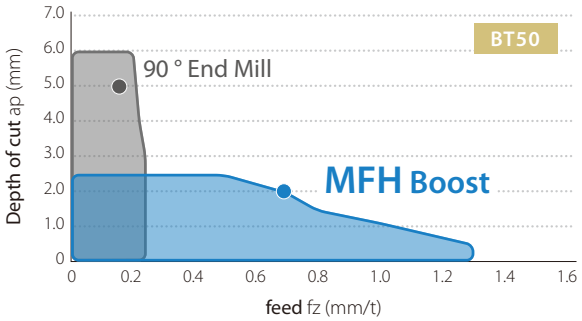
Machining efficiency simulation example

Pocketing: Vc = 150 m/min, ae = 12.5 mm

MFH Boost ø 25 (3 Inserts): **100 cc/min** (ap = **2.0** mm, fz = **0.7** mm/t)

Machining Efficiency x1.8

Conventional 90° End Mill ø 25 (3 Inserts): **54 cc/min** (ap = **5.0** mm, fz = **0.15** mm/t)



High efficiency and good tool life

Machining efficiency and cutting edge condition comparison (Internal evaluation)

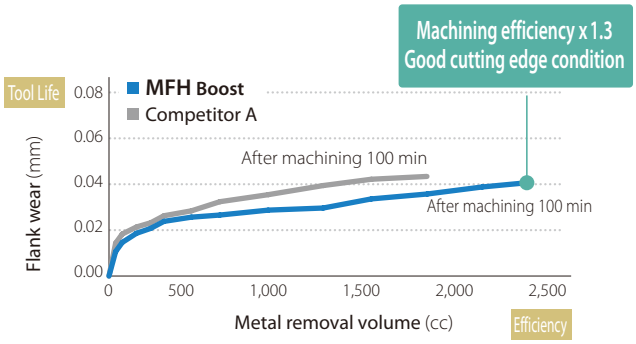
Cutting edge condition after 100 min machining

MFH Boost: ap = 1.6 mm, fz = **0.6** mm/t

Competitor A 90° End Mill: ap = 5.0 mm, fz = **0.15** mm/t







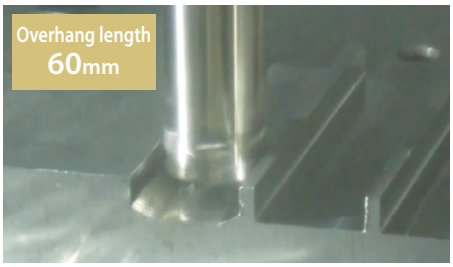
Vc = 150 m/min, ae = 12.5 mm, Dry SCM440 Ⓗ ø 25 (1 Insert) BT50

High stability in unstable machining environment

Chatter resistance comparison (Internal evaluation)

Slotting
ø 25 (3 Inserts)
External air
S50C
BT50

Video



Machining efficiency

Machining Efficiency x4.5

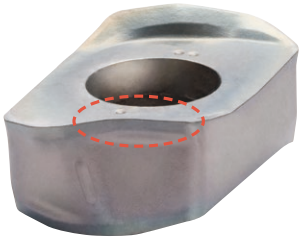
MFH Boost: **103 cc/min** (Vc = 120 m/min, ap = 1.5 mm, fz = **0.6** mm/t)

Competitor B 90° End mill:
31 cc/min **Chattering** (Machining was impossible) (Vc = 80 m/min, ap = 2 mm, fz = 0.2 mm/t)
23 cc/min (Vc = 80 m/min, ap = 2 mm, fz = 0.15 mm/t)

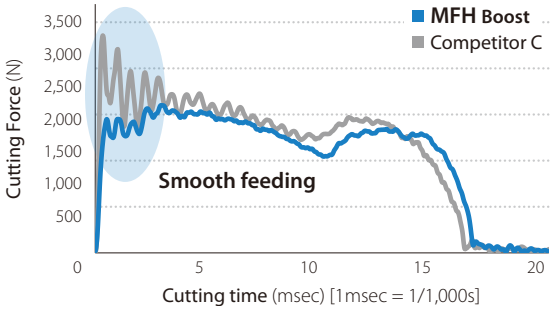
High efficiency and stable machining designs

Kyocera's original technology

Convex cutting edge design reduces impact when entering workpiece



Cutting force when entering workpiece (Internal evaluation)



Vc = 150 m/min, ap = 2.0 mm, ae = 25 mm, fz = 0.7 mm/t, Dry S50C ø 50 (1 Insert) BT50

2 Better solution to **conventional high feed cutters**

Large D.O.C. dramatically improves machining efficiency

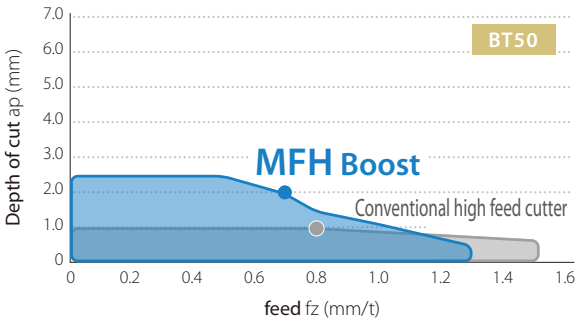
Machining efficiency simulation example

Multistage machining (Depth 30 mm): Vc = 150 m/min, ae = 12.5 mm

Machining Efficiency

MFH Boost ø 25 (3 Inserts): **100 cc/min** (x 1.3)
ap = 2.0 mm, fz = **0.7** mm/t

Conventional high feed cutter ø 25 (4 Inserts): **76 cc/min**
ap = **1.0** mm, fz = **0.8** mm/t



High efficiency and good tool life

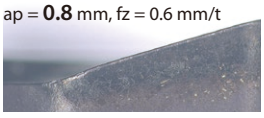
Machining efficiency and cutting edge condition comparison (Internal evaluation)

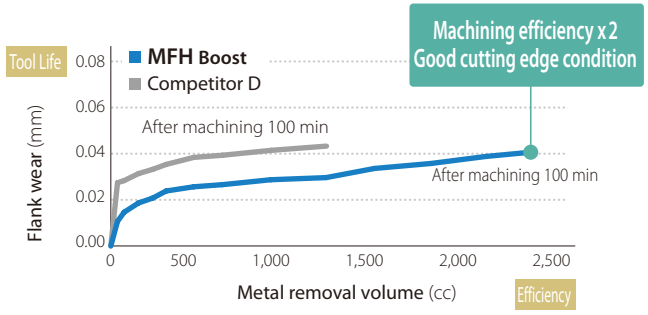
Cutting edge condition after 100 min machining

MFH Boost
ap = 1.6 mm, fz = 0.6 mm/t



Competitor D High feed type
ap = **0.8** mm, fz = 0.6 mm/t





Vc = 150 m/min, ae = 12.5 mm, Dry SCM440 (H) ø 25 (1 Insert) BT50

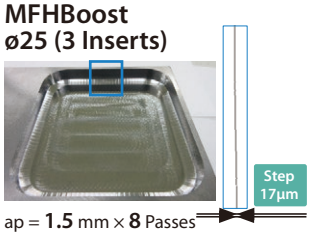
Excellent wall accuracy

Video

Machining efficiency and wall accuracy comparison (Internal evaluation)

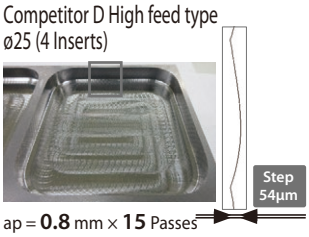
Pocketing (Depth 12mm)

MFHBoost ø25 (3 Inserts)



ap = **1.5** mm × **8** Passes
Q = **115** cc/min

Competitor D High feed type ø25 (4 Inserts)

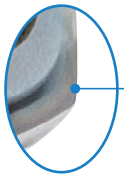


ap = **0.8** mm × **15** Passes
Q = **81** cc/min

Cutting conditions: Vc = 200 m/min, ae = 12.5 mm, fz = 0.8 mm/t, Dry S50C BT50

Superior wall accuracy





Wiper on outer periphery

Reduction of wall level variation in multi-pass machining

Video

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)

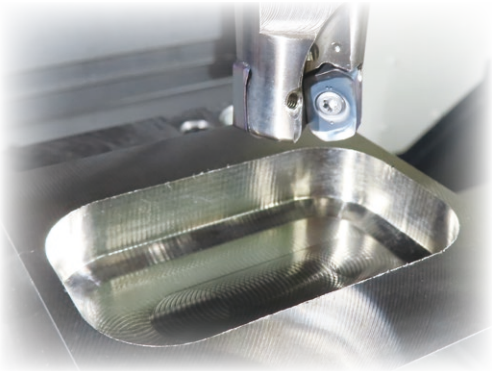
Titanium alloy pocketing (Depth 6 mm)

Machining Efficiency

MFH Boost: **Approx. 1' 30"** (x 1.8)
ap = **1.5** mm × **4** Passes (fz = ~0.35 mm/t)

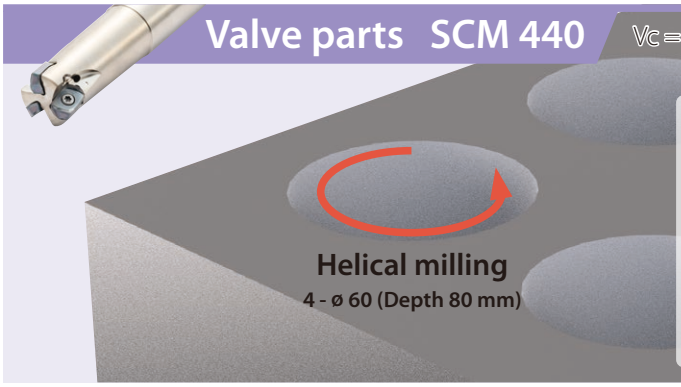
Competitor E High feed type: **Approx. 2' 50"**
ap = **0.6** mm × **10** Passes (fz = ~0.4 mm/t)

Vc = 50 m/min, ae = 12.5 mm (ae/DCX = 50%), Ramping angle 3° Ti-6Al-4V Wet ø 25 (3 Inserts) BT50



Valve parts SCM 440

Vc = 180 m/min, ap × ae = 1.5 × 32 mm, fz = 0.35 mm/t, BT50



MFH Boost ø 32 (4 Inserts) — Q = 132 cc/min

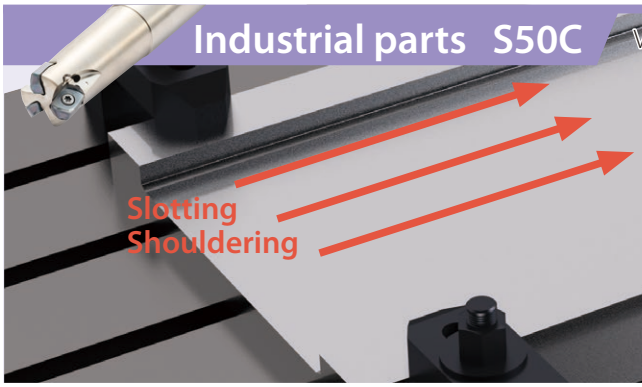
Conventional F High Feed Type ø 32 (3 Inserts) — Q = 38 cc/min

Machining Efficiency x3.5

The MFH boost achieved 3.5 times machining efficiency **by increasing the D.O.C. and number of inserts.**
Even with 90mm overhang portion, ap = 1.5 mm large D.O.C. machining is possible.

Industrial parts S50C

Vc = 150 m/min, ap × ae = 1.0 × ~20 mm, fz = 0.36 mm/t, BT40



MFH Boost ø25 (3 Inserts) — Q = 42 cc/min

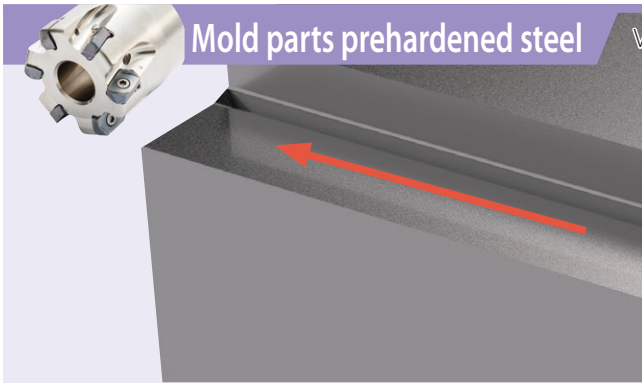
Competitor G 90° End Mill ø 25 (2 Inserts) — Q = 13 cc/min

Machining Efficiency x3.2

The MFH boost achieved 3.2 times machining efficiency **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

Vc = 120 m/min, ap × ae = 1.5 × 30 mm, fz = 0.7 mm/t, Internal air



MFH Boost ø 50 (7 Inserts) — Q = 192 cc/min

Competitor H High Feed Type ø 50 (7 Inserts) — Q = 140 cc/min

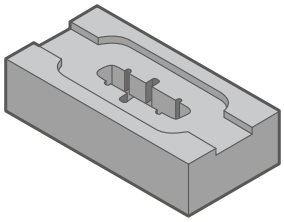
Machining Efficiency x1.4

The MFH Boost provides a low cutting forces **even when the feed and ap are increased.** Machining efficiency 1.4 times. Even when machining where the depth of cut is doubled, distortion is equivalent to competitor D.

(User evaluation)

Case Studies

Mold SKD61



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

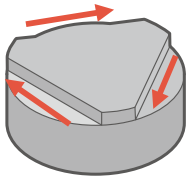
Chip Evacuation

MFH Micro	**4.5** cc/min	Efficiency x1.3
Competitor J ø12-3T	**3.4** cc/min	

MFH Micro shows 1.3 times machining efficiency compared to Competitor J
Good cutting edge condition after machining almost doubling the tool life

(User Evaluation)

Industrial Machine Parts SUS440C



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

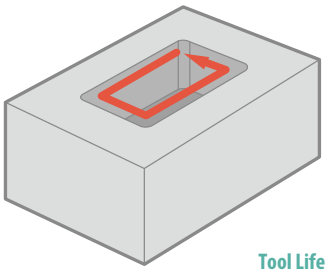
Cutting Time

MFH Micro	**7** min	35% Cutting Time
Competitor K	**11** min	

MFH Micro shows 30% faster cycle time compared to competitor K

(User Evaluation)

Mold Parts Pre-hardened Steel



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

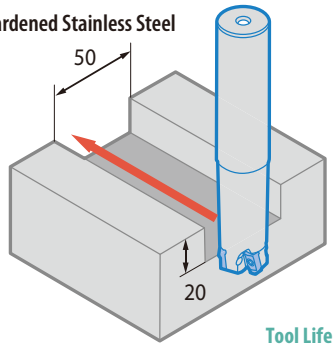
Tool Life

MFH Mini	**2.0** H	Tool Life MAX x2
Competitor L (4 Inserts)	**1.0~1.5** H	

MFH Mini shows lower cutting load compared to competitor L and can extend the machining time.

(User Evaluation)

Airplane Parts Precipitation Hardened Stainless Steel



Vc = 120 m/min (n = 1,530 min^{-1})
ap × ae = 0.7 × ~ 25 mm
fz = 0.6 mm/t (Vf = 3,670 mm/min)
Dry
MFH25-S25-03-4T (4 Inserts)
LOGU030310ER-GM PR1535

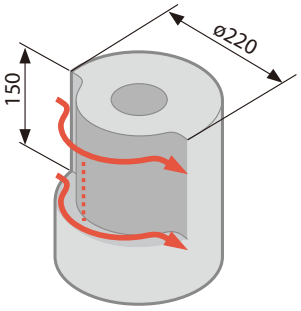
Number of Workpieces

MFH Mini	**100** pcs	Tool Life x1.8
Competitor M (5 Inserts)	**55** pcs	

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

(User Evaluation)

Construction Machine Parts S25C



Vc = 220 m/min (n = 1,750 min^{-1})
ap × ae = 1.5 × 30 mm
fz = 0.7 mm/t (Vf = 4,900 mm/min)
Dry
MFH40-S32-10-4T (4 Inserts)
SOMT140520ER-GM PR1525

Cutting Time

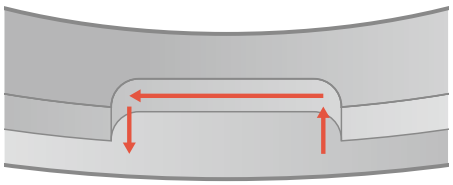
MFH Harrier	**950** sec	75% Cutting Time
Competitor N (90° Cutter)	**3,800** sec	

MFH Harrier features a higher number of passes compared to Competitor N, 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^{-1}), ap × ae = 1.0 × 20 mm
fz = 1.2 mm/t (Vf = 2,850 mm/min), Dry
MFH32-S32-10-2T (2 Inserts), SOMT100420ER-GM PR1535

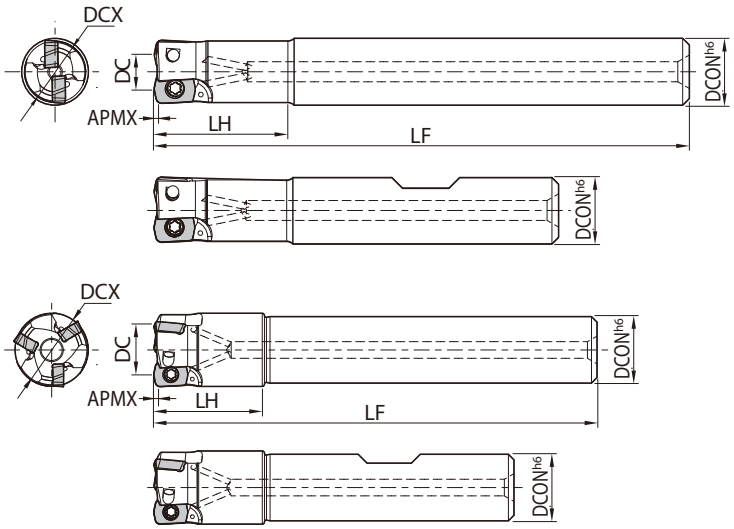
Chip Evacuation

MFH Harrier	**58** cc/min	Efficiency x1.6
Competitor O	**36** cc/min	

MFH Harrier shows stable machining while Competitor O generated chattering.
MFH Harrier maintained a good cutting edge condition with stable machining.

(User Evaluation)





Toolholder dimensions (Shank Type)

Shank	Description	Stock	No. of Inserts	Dimensions (mm)						Max. Ramping angle	Rake Angle	Coolant Hole	Drawing	Weight (kg)	Max. Revolution (min^{-1})
				DCX	DC	DCON	LF	LH	APMX		A.R.				
Standard Shank (Cylindrical)	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 Shank (Cylindrical)	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

● : Available

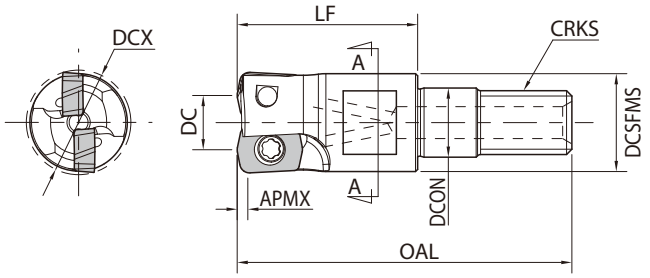
• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

Spare Parts and Applicable Inserts

Description	Spare Parts		Applicable Inserts
	Insert screw	Wrench	
			
MFH…-01-…	SB-1840TRP	FTP-6	LPGT010210ER-GM
	Recommended Torque for Insert Clamp 0.5N·m		

MFH Micro | Modular





Toolholder dimensions

Description	Stock	No. of Inserts	Dimensions (mm)									Max. Ramping angle	Rake Angle	Coolant Hole	Max. Revolution (min^{-1})
			DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX		A.R.		
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 - ø14 screw size: M6 x P1.0)
Check screw specifications for the shank in use.

● : Available

Spare Parts and Applicable Inserts

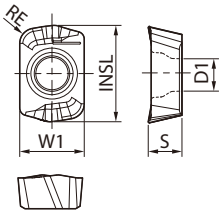
Description	Spare Parts		Applicable Inserts
	Insert screw	Wrench	
			
MFH…-01-…	SB-1840TRP	FTP-6	LPGT010210ER-GM
	Recommended Torque for Insert Clamp 0.5N·m		

• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

MFH Micro | Applicable Inserts

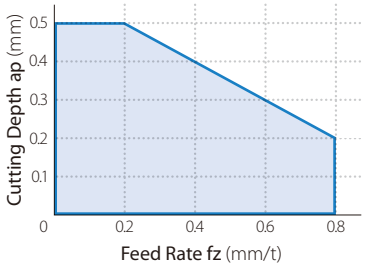
Classification of Usage					
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice	P	Carbon Steel / Alloy Steel	★	☆	
		Mold Steel	★	☆	
	M	Austenitic Stainless Steel	☆	★	
		Martensitic Stainless Steel		☆	
		Precipitation Hardened Stainless Steel		★	
	K	Gray Cast Iron			
		Nodular Cast Iron			
	S	Ni-base Heat-Resistant Alloy		☆	☆
		Titanium Alloy		☆	★
	H	High Hardness Steel			

Insert		Description	Dimensions (mm)					MEGACOAT NANO EX		MEGACOAT TOUGH	CVD Coated Carbide
			W1	S	D1	INSL	RE	PR1825	PR1835	PM335S	CA6535
 General Purpose		LPGT 010210ER-GM	4.19	2.19	2.1	6.26	1.0	●	●	●	●

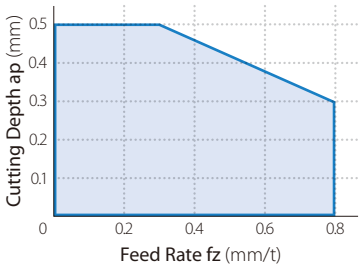
● : Available

MFH Micro | Cutting Performance

Cutting Diameter: ø8 - ø12



Cutting Diameter: ø14 - ø16



MFH Micro | Recommended cutting conditions

★1st recommendation ☆2nd recommendation

Chipbreaker	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 EX		MEGACOAT TOUGH	CVD Coated Carbide
							PR1825	PR1835	PM335S	CA6535
GM	Carbon Steel	0.2 - **0.4** - 0.6			0.2 - **0.5** - 0.8		★ 120 - **180** - 250	☆ 120 - **180** - 250	-	-
	Alloy Steel						★ 100 - **160** - 220	☆ 100 – **160** - 220	-	-
	Mold Steel (~40HRC)	0.2 - **0.3** - 0.5			0.2 - **0.4** - 0.6		★ 80 - **140** - 180	☆ 80 - **140** - 180	-	-
	Mold Steel (40~50HRC)	0.2 - **0.25** - 0.3			0.2 - **0.25** - 0.4		☆ 60 - **100** - 130	-	-	-
	Austenitic Stainless Steel	0.2 - **0.3** - 0.5			0.2 - **0.4** - 0.6		☆ 100 - **160** - 200	★ 100 - **160** - 200	-	-
	Martensitic Stainless Steel						-	☆ 150 - **200** - 250	-	★ 180 - **240** - 300
	Precipitation Hardened Stainless Steel						-	★ 90 - **120** - 150	-	-
	Gray Cast Iron	0.2 - **0.4** - 0.6			0.2 - **0.5** - 0.8		★ 120 - **180** - 250	-	-	-
	Nodular Cast Iron	0.2 - **0.3** - 0.5			0.2 - **0.4** - 0.6		★ 100 - **150** - 200	-	-	-
	Ni-base Heat-Resistant Alloy	0.2 - **0.25** - 0.3			0.2 - **0.25** - 0.4		-	☆ 20 - **30** - 50	☆ 20 - **30** - 50	★ 20 - **30** - 50
	Titanium Alloy						-	☆ 40 - **60** - 80	★ 40 - **60** - 80	-

- The numbers shown in **bold font** indicate the recommended standard cutting conditions. Adjust the cutting speed and feed rate within the specified range according to the actual machining conditions.
- Machining with coolant is recommended for Precipitation Hardened Stainless Steel, Ni-base Heat-Resistant Alloy, and Titanium Alloy.
- Machining with coolant may have a lower tool life than dry machining. Set the cutting speed, feed rate and D.O.C. lower than recommended conditions.
- Center-through coolant is recommended for slotting.



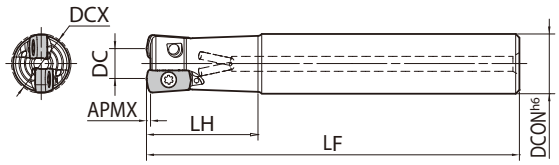


Fig.1

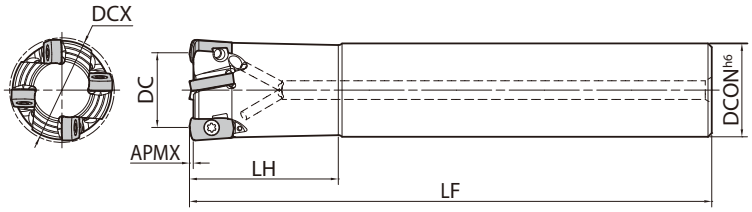


Fig.2

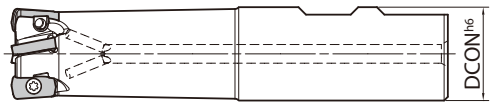


Fig.3

Toolholder dimensions

Shank	Description	Stock	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 Shank (Cylindrical)	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 Shank (Cylindrical)	MFH 17-S16-03-2T	●	2	17	9	16	100	20				Fig.2	0.1	17,900
	MFH 18-S16-03-2T	●	2	18	10	16	100	20					0.1	17,000
	MFH 22-S20-03-3T	●	3	22	14	20	130	30					0.3	14,700
	22-S20-03-4T	●	4	22	14	20	130	30					0.3	14,700
	MFH 28-S25-03-4T	●	4	28	20	25	140	40					0.5	12,400
	28-S25-03-5T	●	5	28	20	25	140	40					0.5	12,400
Standard Shank (Weldon)	MFH 16-W16-03-2T	●	2	16	8	16	79	30				Fig.3	0.1	18,800
	MFH 20-W20-03-3T	●	3	20	12	20	101	50					0.2	15,700
	20-W20-03-4T	●	4	20	12	20	101	50					0.2	15,700
	MFH 25-W25-03-4T	●	4	25	17	25	117	60					0.4	13,400
	25-W25-03-5T	●	5	25	17	25	117	60					0.4	13,400
	MFH 32-W32-03-5T	●	5	32	24	32	131	70					0.7	11,400
	32-W32-03-6T	●	6	32	24	32	131	70					0.7	11,400
Long Shank (Cylindrical)	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

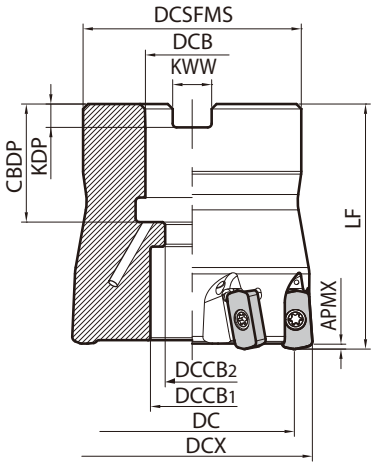
Description	Spare Parts			Applicable Inserts
	Insert screw	Wrench	Arbor clamp bolt	
				
MFH…-03-…	SB-3065TRP	DTPM-8	-	LOGU030310ER-GM LOGU030310ER-GH
MFH040R-03-…-M	Recommended Torque for Insert Clamp 1.2N·m		HH8×25	
MFH050R-03-8T-M			HH10×30	

• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

MFH Mini | Face Mill





Toolholder dimensions

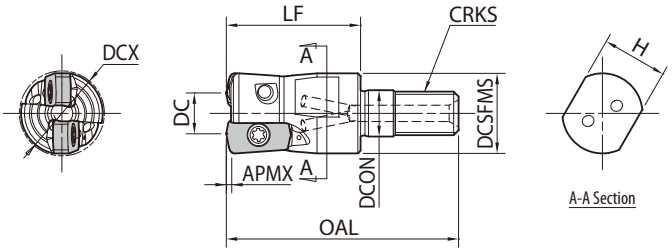
Bore Dia.	Description	Stock	No. of Inserts	Dimensions (mm)											Rake Angle	Coolant Hole	Weight (kg)	Max. Revolution (min^{-1})
				DCX	DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX	A.R.			
Metric Spec	MFH 040R-03-5T-M	●	5	40	32	38	16	15	9	40	19	5.6	8.4	1	−10°	Yes	0.2	9,900
	040R-03-6T-M	●	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				0.5	8,600

• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

MFH Mini | Modular





Toolholder dimensions

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

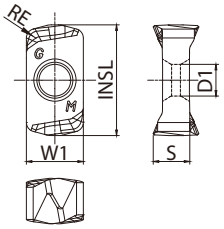
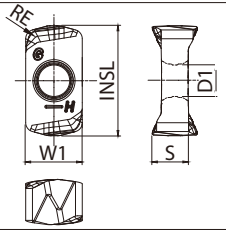
• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

MFH Mini | Applicable Inserts

Classification of Usage									
	P	Carbon Steel / Alloy Steel	★	☆				
		Mold Steel	★	☆				
	M	Austenitic Stainless Steel	☆	★				
		Martensitic Stainless Steel		☆				★
		Precipitation Hardened Stainless Steel		★				
	K	Gray Cast Iron			★			
		Nodular Cast Iron			★			
	S	Ni-base Heat-Resistant Alloy		☆		☆		★
		Titanium Alloy		☆		★		
	H	Hardened Materials					★	

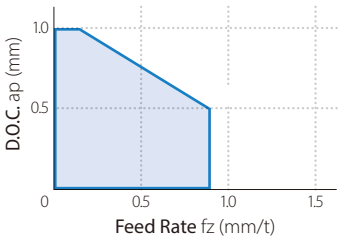
★ : Roughing / 1st Choice
☆ : Roughing / 2nd Choice
■ : Finishing / 1st Choice
□ : Finishing / 2nd Choice

Insert		Description	Dimensions (mm)					MEGACOAT NANO EX			MEGACOAT TOUGH	MEGACOAT HARD	CVD Coated Carbide
			W1	S	D1	INSL	RE	PR1825	PR1835	PR1810	PM335S	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

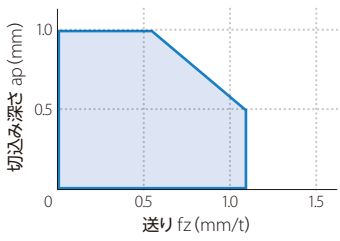
MFH Mini | Cutting Performance

Fine Pitch End Mill



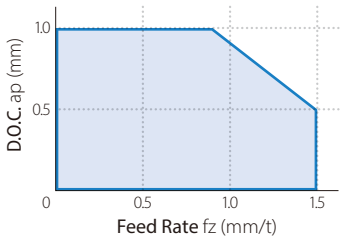
MFH20-…-4T, MFH22-…-4T,
MFH25-…-5T, MFH28-…-5T,
MF32-…-6T

Standard Pitch End Mill
(Cutter Dia. ø16 – ø22 mm)



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

Face Mill (Cutter Dia. ø40 – ø50 mm)
Standard Pitch End Mill
(Cutter Dia. ø25 – ø32 mm)



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

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

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

Chipbreaker	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 EX			MEGACOAT TOUGH	MEGACOAT HARD	CVD Coated Carbide
										PR1825	PR1835	PR1810	PM335S	PR015S	CA6535
GM GH	Carbon Steel	0.2 - **0.7** - 1.2		0.2 - **0.5** - 0.8	0.2 - **0.8** - 1.5	0.2 - **0.5** - 0.8	0.2 - **0.8** - 1.5	0.2 - **0.5** - 0.8	0.2 - **0.8** - 1.5	★ 120 - **180** - 250	☆ 120 - **180** - 250	-	-	-	-
	Alloy Steel									★ 100 - **160** - 220	☆ 100 - **160** - 220	-	-	-	-
	Mold Steel (- 40HRC)	0.2 - **0.5** - 0.9		0.2 - **0.4** - 0.6	0.2 - **0.6** - 1.2	0.2 - **0.4** - 0.6	0.2 - **0.6** - 1.2	0.2 - **0.4** - 0.6	0.2 - **0.6** - 1.2	☆ 80 - **140** - 180	☆ 80 - **140** - 180	-	-	★ 80 - **140** - 180	-
	Mold Steel (40 - 50HRC)	0.2 - **0.3** - 0.5		0.2 - **0.25** - 0.3	0.2 - **0.3** - 0.6	0.2 - **0.25** - 0.3	0.2 - **0.3** - 0.6	0.2 - **0.25** - 0.3	0.2 - **0.3** - 0.6	☆ 60 - **100** - 130	-	-	-	★ 60 - **100** - 130	-
	Mold Steel (50 - 55HRC)	0.1 - **0.3** - 0.5		0.1 - **0.2** - 0.3	0.1 - **0.3** - 0.5	0.1 - **0.2** - 0.3	0.1 - **0.3** - 0.5	0.1 - **0.2** - 0.3	0.1 - **0.3** - 0.5	☆ 50 - **70** - 100	-	-	-	★ 50 - **70** - 100	-
	Mold Steel (55 - 60HRC)	0.03 - **0.06** - 0.1 (* Only GH chipbreaker is recommended)								-	-	-	-	★ 50 - **60** - 70	-
	Austenitic Stainless Steel	0.2 - **0.5** - 0.9		0.2 - **0.4** - 0.6	0.2 - **0.6** - 1.2	0.2 - **0.4** - 0.6	0.2 - **0.6** - 1.2	0.2 - **0.4** - 0.6	0.2 - **0.4** - 0.6	☆ 100 - **160** - 200	★ 100 - **160** - 200	-	-	-	-
	Martensitic Stainless Steel									-	☆ 150 - **200** - 250	-	-	-	★ 180 - **240** - 300
	Precipitation Hardened Stainless Steel									-	★ 90 - **120** - 150	-	-	-	-
	Gray Cast Iron	0.2 - **0.7** - 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	-	-	★ 120 - **180** - 250	-	-	-
	Nodular Cast Iron	0.2 - **0.5** - 0.9		0.2 - **0.4** - 0.6	0.2 - **0.6** - 1.2	0.2 - **0.4** - 0.6	0.2 - **0.6** - 1.2	0.2 - **0.4** - 0.6	0.2 - **0.4** - 0.6	-	-	★ 100 - **150** - 200	-	-	-
	Ni-base Heat-Resistant Alloy	0.2 - **0.3** - 0.6		0.2 - **0.25** - 0.4	0.2 - **0.4** - 0.8	0.2 - **0.25** - 0.4	0.2 - **0.4** - 0.8	0.2 - **0.25** - 0.4	0.2 - **0.25** - 0.4	-	☆ 20 - **30** - 50	-	☆ 20 - **30** - 50	-	★ 20 - **30** - 50
	Titanium Alloy									-	☆ 40 - **60** - 80	-	★ 40 - **60** - 80	-	-

- The numbers shown in **bold font** indicate the recommended standard cutting conditions.
  Adjust the cutting speed and feed rate within the specified range according to the actual machining conditions.
- Machining with coolant is recommended for Precipitation Hardened Stainless Steel, Ni-base Heat-Resistant Alloy, and Titanium Alloy.
- Machining with coolant 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 25% of recommended cutting conditions. Slotting is not recommended in this situation.
- Slotting or pocketing are not recommended for face mill types.
- For face milling, it is recommended that width of cut should be set to 75% or less of the cutting diameter.
- For long shank end mills, 75% or less of the recommended conditions is recommended for both D.O.C. and feed rate.

Standard Pitch Fine Pitch



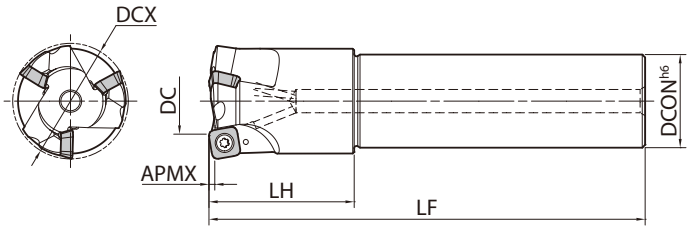


Fig.1

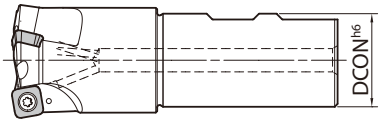


Fig.2

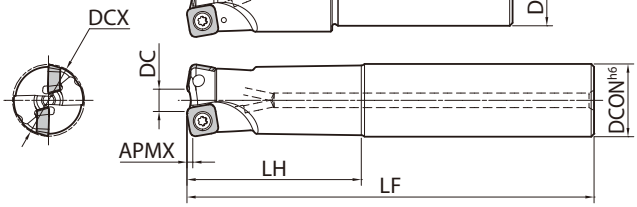


Fig.3

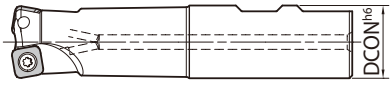
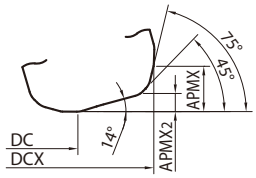


Fig.4

LD Chipbreaker Cutting Edge Dimensions



Toolholder dimensions (SOMT10 Type)

Shank	Description	Stock	No. of Inserts	Dimensions (mm)									Rake Angle	Coolant Hole	Drawing	Weight (kg)	Max. Revolution (min^{-1})
				DCX	DC			DCON	LF	LH	APMX	$APMX_2$	A.R.				
					GM•GH	LD	FL										
Standard Shank (Cylindrical)	MFH 25-S25-10-2T	●	2	25	8	12.5	11.5	25	140	60	1.5 (3.5) *	1.2	+10°	Yes	Fig.3	0.4	17,000
	MFH 28-S25-10-2T	●	2	28	11	15.5	14.5	25	140	40					Fig.1	0.5	15,500
	MFH 32-S32-10-2T	●	2	32	15	19.5	18.5	32	150	70					Fig.3	0.8	14,000
	32-S32-10-3T	●	3	32	15	19.5	18.5	32	150	70						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
	35-S32-10-3T	●	3	35	18	22.5	21.5	32	150	50						0.8	13,000
	MFH 40-S32-10-3T	●	3	40	23	27.5	26.5	32	150	50						0.9	11,500
	40-S32-10-4T	●	4	40	23	27.5	26.5	32	150	50						0.9	11,500
Standard Shank (Weldon)	MFH 25-W25-10-2T	●	2	25	8	12.5	11.5	25	117	60	1.5 (3.5) *	1.2	+10°	Yes	Fig.4	0.4	17,000
	MFH 32-W32-10-3T	●	3	32	15	19.5	18.5	32	131	70						0.7	14,000
	MFH 40-W32-10-3T	●	3	40	23	27.5	26.5	32	112	50					Fig.2	0.7	11,500
	40-W32-10-4T	●	4	40	23	27.5	26.5	32	112	50						0.7	11,500
Long Shank (Cylindrical)	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 (Cylindrical)	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
	Insert Screw	Wrench	
			
MFH…-10-…	SB-4075TRP	DTPM-15	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
	Recommended Torque for Insert Clamp 3.5N·m		

• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.

Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.



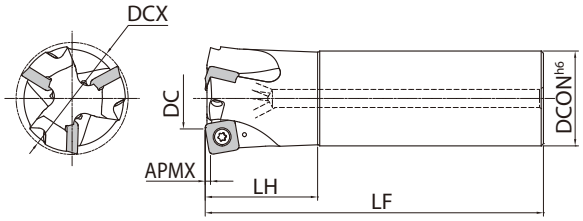
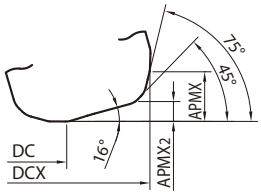


Fig.1

LD Chipbreaker Cutting Edge Dimensions



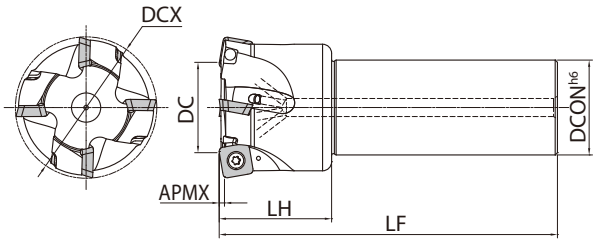


Fig.2

Toolholder dimensions (SOMT14 Type)

Description	Stock	No. of Inserts	Dimensions (mm)									Rake Angle	Coolant Hole	Drawing	Weight (kg)	Max. Revolution (min^{-1})
			DCX	DC			DCON	LF	LH	APMX	$APMX_2$	A.R.				
				GM•GH	LD	FL										
MFH50-S42-14-3T	●	3	50	27	33	32	42	150	50	2 * (5)	2	+10°	Yes	Fig. 1	1.4	8,800
MFH63-S42-14-4T	●	4	63	40	46	45	42	150	50					Fig. 2	1.7	7,400
MFH80-S42-14-5T	●	5	80	57	63	62	42	150	50						2.3	6,400

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

Spare Parts and Applicable Inserts

Description	Spare Parts		Applicable Inserts
	Insert Screw	Wrench	
			
MFH…-14-…	SB-50120TRP	TTP-20	SOMT140520ER-GM SOMT140520ER-GH SOMT140520ER-LD SOMT140514ER-FL
	Recommended Torque for Insert Clamp 4.5N·m		

• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.



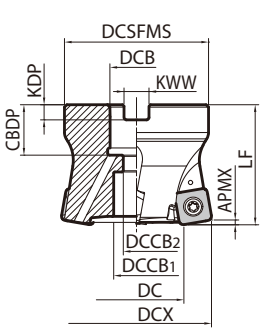


Fig.1

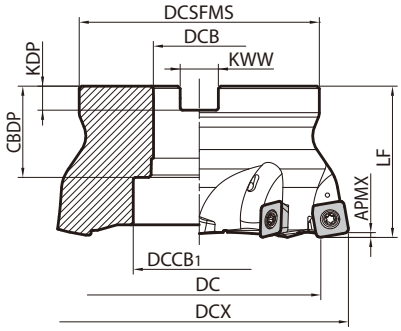


Fig.2

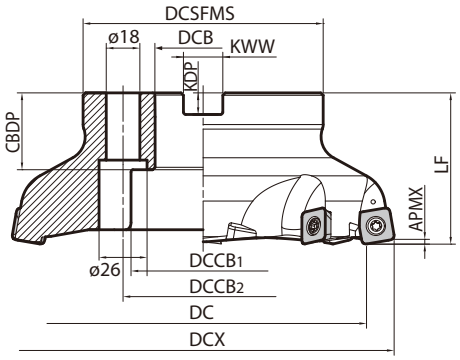


Fig.3

Toolholder dimensions (SOMT10 Type)

Bore Dia.	Description	Stock	No. of Inserts	Dimensions (mm)														Rake Angle	Coolant Hole	Drawing	Weight (kg)	Max. Revolution (min^{-1})
				DCX	DC			DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX	$APMX_2$ *1	A.R.				
					GM•GH	LD	FL															
Inch Spec	MFH 050R-10-4T	●	4	50	33	37.5	36.5	47	22.225	19	11	50	19	5	8.4						0.4	10,000
	050R-10-5T	●	5	50	33	37.5	36.5	47	22.225	19	11	50	19	5	8.4						0.4	10,000
	MFH 063R-10-5T	●	5	63	46	50.5	49.5	60	22.225	19	11	50	19	5	8.4				Yes	Fig.1	0.7	8,800
	063R-10-6T	●	6	63	46	50.5	49.5	60	22.225	19	11	50	19	5	8.4						0.7	8,800
	MFH 080R-10-7T	●	7	80	63	67.5	66.5	76	31.75	26	17	63	32	8	12.7						1.3	7,600
Metric Spec	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°			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				Yes	Fig.1	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 24 *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 for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

Toolholder Dimensions (SOMT14 Type)

Bore Dia.	Description	Stock	No. of Inserts	Dimensions (mm)														Rake Angle	Coolant Hole	Drawing	Weight (kg)	Max. Revolution (min^{-1})
				DCX	DC GM·GH	DC LD	DC FL	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX	$APMX_2$ *1	A.R.				
Inch Spec	MFH 050R-14-4T	●	4	50	27	33	32	47	22.225	12	–	50	19	5	8.4	2 (5) *2	2	+10°	Yes	Fig.1	0.4	8,800
	MFH 063R-14-4T	●	4	63	40	46	45	60	22.225	19	11	50	19	5	8.4						0.6	7,400
	063R-14-5T	●	5	63	40	46	45	60	22.225	19	11	50	19	5	8.4						0.6	7,400
	MFH 080R-14-5T	●	5	80	57	63	62	76	31.75	26	17	63	32	8	12.7						1.3	6,400
	080R-14-6T	●	6	80	57	63	62	76	31.75	26	17	63	32	8	12.7						1.3	6,400
	MFH 100R-14-6T	●	6	100	77	83	82	96	31.75	26	17	63	32	8	12.7						2.4	5,600
	100R-14-7T	●	7	100	77	83	82	96	31.75	26	17	63	32	8	12.7						2.4	5,600
	MFH 125R-14-7T	●	7	125	102	108	107	100	38.1	55	–	63	38	10	15.9					Fig.2	2.9	4,800
	MFH 160R-14-8T	●	8	160	137	143	142	100	50.8	72	–	63	38	11	19.1				No		3.9	4,200
Metric Spec	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					Fig.2	2.4	5,600
	100R-14-7T-M	●	7	100	77	83	82	96	32	26	17	63	28	8	14.4						2.4	5,600
	MFH 125R-14-7T-M	●	7	125	102	108	107	100	40	55	–	63	33	9	16.4						2.8	4,800
	MFH 160R-14-8T-M	●	8	160	137	143	142	100	40	68	66.7	63	32	9	16.4				No	Fig.3	3.7	4,200

MHF050R-14-4T and MFH050R-14-4T-M have double screws.
Read the instruction manual attached to the toolholder for handling method.

*1 Refer to the figure below for the $APMX_2$. *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 for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

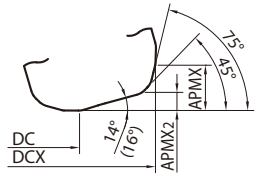
Spare Parts and Applicable Inserts

Description	Spare Parts: Insert screw	Spare Parts: Wrench		Spare Parts: Arbor clamp bolt	Applicable Inserts
		DTPM 	TTP 		
MFH050R-10-…(-M)	SB-4090TRPN	DTPM-15		HH10×30	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
MFH063R-10-…(-22M)				HH10×30	
MFH063R-10-…-27M				HH12×35	
MFH080R-10-…				HH16×40	
MFH080R-10-…-M				HH12×35	
MFH050R-14-…(-M)	SB-50120TRP	TTP-20		W10×31	SOMT140520ER-GM SOMT140520ER-GH SOMT140520ER-LD SOMT140514ER-FL
MFH063R-14-…(-22M)				HH10×30	
MFH063R-14-…-27M				HH12×35	
MFH080R-14-…				HH16×40	
MFH080R-14-…-M				HH12×35	
MFH100R-14-…				HH16×40	
MFH100R-14-…-M				-	
MFH125R-14-…				-	
MFH160R-14-…				-	

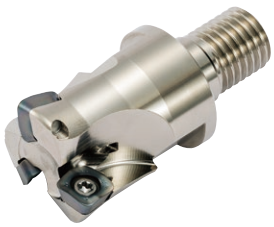
Recommended Torque for Insert Clamp 3.5N·m

Recommended Torque for Insert Clamp 4.5N·m

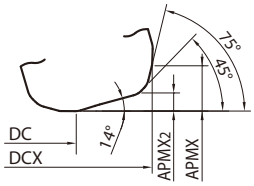
LD Chipbreaker Cutting Cutting Edge Dimensions

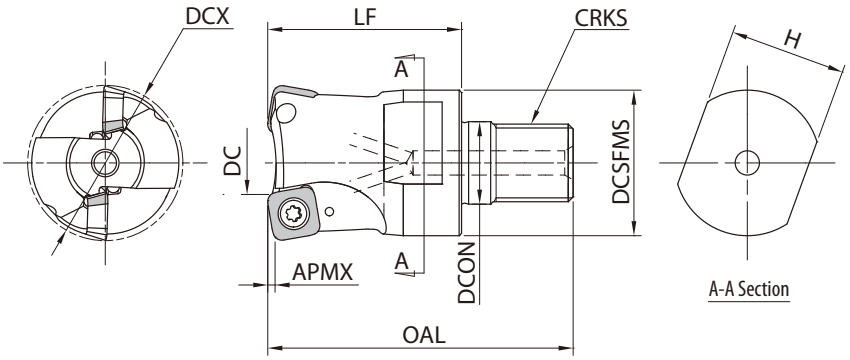


Angle in ( ) is for SOMT14 Type



LD Chipbreaker Cutting Edge Dimensions





Toolholder dimensions

Description		Stock	No. of Inserts	Dimensions (mm)												Rake Angle	Coolant Hole	Max. Revolution (min^{-1})
				DCX	DC			DCSFMS	DCON	OAL	LF	CRKS	H	APMX	APMX2	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
	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
	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
	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 for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

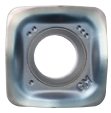
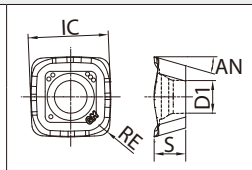
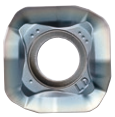
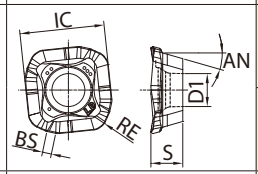
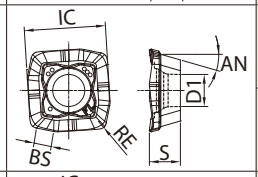
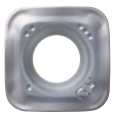
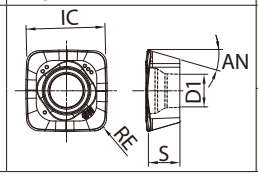
* Dimension in ( ) is when mounting LD Type ● : Available

Spare Parts and Applicable Inserts

Description	Spare Parts		Applicable Inserts
	Insert screw	Wrench	
			
MFH…-10-…	SB-4075TRP	DTPM-15	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
	Recommended Torque for Insert Clamp 3.5N·m		

MFH Harrier | Applicable Inserts

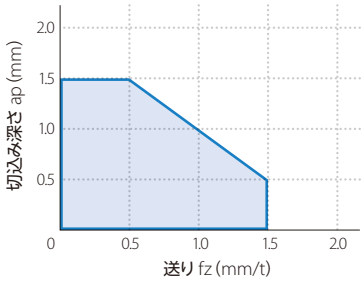
Classification of Usage									
★: Roughing / 1st Choice ☆: Roughing / 2nd Choice ■: Finishing / 1st Choice □: Finishing / 2nd Choice	P	Carbon Steel / Alloy Steel	★	☆				
		Mold Steel	★	☆				
	M	Austenitic Stainless Steel	☆	★				
		Martensitic Stainless Steel		☆				★
		Precipitation Hardened Stainless Steel		★				
	K	Gray Cast Iron			★			
		Nodular Cast Iron			★			
	S	Ni-base Heat-Resistant Alloy		☆		☆		★
		Titanium Alloy		☆		★		
	H	High Hardness Steel					★	

Insert		Description	Dimensions (mm)					Angle (°)	MEGACOAT NANO			MEGACOAT TOUGH	MEGACOAT HARD	CVD Coated Carbide
			IC	S	D1	BS	RE	AN	PR1825	PR1835	PR1810	PM335S	PR015S	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	●	●	●	-	●	-

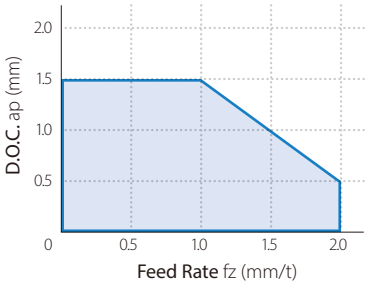
●: Available

MFH Harrier | Cutting Performance

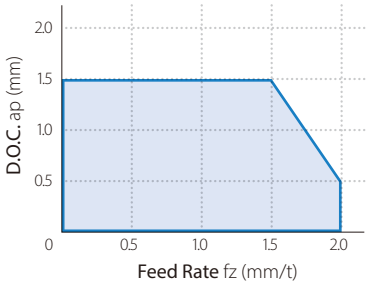
MFH25…



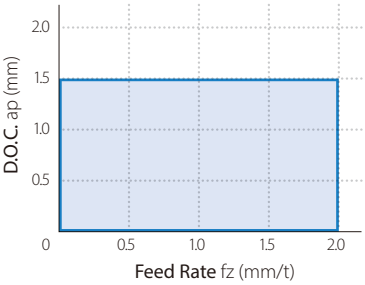
MFH32…/MFH35…



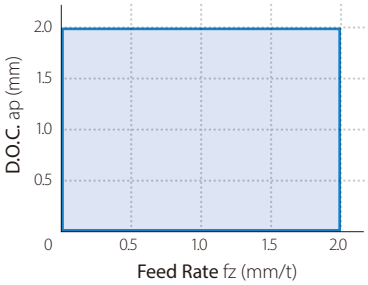
MFH40…



MFH050…~MFH080…



SOMT14 Type



LD Chipbreaker:
- MAX D.O.C. for LD chipbreaker is 5mm. (3.5mm for SOMT10 Type) Refer to the recommended cutting conditions table for the feed rate.
- End Mill: Please refer to the application map above.
- Face Mill: Maximum feed rate (feed per tooth) fz = 2.0mm/t

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

Chipbreaker	Workpiece		ap (mm)	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 TOUGH	MEGACOAT HARD	CVD Coated Carbide
									PR1825	PR1835	PR1810	PM335S	PR015S	CA6535
GM GH	Carbon Steel		≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0		★ 120 - **180** - 250	☆ 120 - **180** - 250	-	-	-	-
			≦1.5	0.2 - **0.4** - 0.5	0.3 - **0.7** - 1.0	0.4 - **1.0** - 1.5								
	Alloy Steel		≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** -2.0		★ 100 - **160** - 220	☆ 100 - **160** - 220	-	-	-	-
			≦1.5	0.2 - **0.4** - 0.5	0.3 - **0.7** - 1.0	0.4 - **1.0** - 1.5								
	Mold Steel	(- 40HRC)	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		☆ 80 - **140** - 180	☆ 80 - **140** - 180	-	-	★ 80 - **140** - 180	-
			≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
		(40 - 50HRC)	≦1.0	0.15 - **0.3** - 0.5	0.2 - **0.5** - 0.8	0.2 - **0.6** - 0.9	0.2 - **0.7** - 1.0		☆ 60 - **100** - 130	-	-	-	★ 60 - **100** - 130	-
			≦1.5	0.15 - **0.2** - 0.25	0.2 - **0.3** - 0.45	0.2 - **0.5** - 0.7								
		(50 - 55HRC)	≦1.0	0.15 - **0.25** - 0.4	0.15 - **0.35** - 0.6	0.15 - **0.4** - 0.7	0.2 - **0.5** - 0.8		☆ 50 - **70** - 100	-	-	-	★ 50 - **70** - 100	-
		(55 - 60HRC)	≦1.0	0.03 - **0.06** - 0.1(ap≦1.0mm) (* Only GH chipbreaker is recommended)					-	-	-	-	★ 50 - **60** - 70	-
	Austenitic Stainless Steel		≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		☆ 100 - **160** - 200	☆ 100 - **160** - 200	-	-	-	-
			≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
	Martensitic Stainless Steel		≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		-	☆ 150 - **200** - 250	-	-	-	★ 180 - **240** - 300
			≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
	Precipitation Hardened Stainless Steel		≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		-	★ 90 - **120** - 150	-	-	-	-
			≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
	Gray Cast Iron		≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0		-	-	★ 120 - **180** - 250	-	-	-
			≦1.5	0.2 - **0.4** - 0.5	0.3 - **0.7** - 1.0	0.4 - **1.0** - 1.5								
	Nodular Cast Iron		≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		-	-	★ 100 - **150** - 200	-	-	-
			≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
	Ni-base Heat-Resistant Alloy		≦1.0	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.9	0.2 - **0.6** - 1.0	0.2 - **0.8** - 1.2		-	☆ 20 - **30** - 50	-	☆ 20 - **30** - 50	-	★ 20 - **30** - 50
			≦1.5	0.15 - **0.2** - 0.3	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.8								
	Titanium Alloy		≦1.0	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.9	0.2 - **0.6** - 1.0	0.2 - **0.8** - 1.2		-	☆ 40 - **60** - 80	-	★ 40 - **60** - 80	-	-
			≦1.5	0.15 - **0.2** - 0.3	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.8								
LD	Carbon Steel		≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0	0.5 - **1.5** - 2.0	★ 120 - **180** - 250	☆ 120 - **180** - 250	-	-	-	-
			≦2.0	0.06 - **0.1** - 0.2	0.06 - **0.15** - 0.3	0.06 - **0.2** - 0.3	0.06 - **0.2** - 0.3							
			≦3.5					0.06 - **0.2** - 0.4						
			≦5.0	-	-	-	-							
	Alloy Steel		≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0	0.5 - **1.5** - 2.0	★ 100 - **160** - 220	☆ 100 - **160** - 220	-	-	-	-
			≦2.0	0.06 - **0.1** - 0.2	0.06 - **0.15** - 0.3	0.06 - **0.2** - 0.3	0.06 - **0.2** - 0.3							
			≦3.5					0.06 - **0.2** - 0.4						
			≦5.0	-	-	-	-							
	Mold Steel (- 40HRC)		≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	0.5 - **1.2** - 1.8	★ 80 - **140** - 180	☆ 80 - **140** - 180	-	-	-	-
			≦2.0	0.06 - **0.08** - 0.15	0.06 - **0.1** - 0.2	0.06 - **0.15** - 0.2	0.06 - **0.15** - 0.2							
			≦3.5					0.06 - **0.15** - 0.3						
			≦5.0	-	-	-	-							
	Mold Steel (40 - 50HRC)		≦1.0	0.2 - **0.3** - 0.5	0.2 - **0.5** - 0.8	0.2 - **0.6** - 0.9	0.2 - **0.7** - 1.0	0.2 - **0.7** - 1.0	★ 60 - **100** - 130	☆ 60 - **100** - 130	-	-	-	-
			≦2.0	0.03 - **0.05** - 0.1	0.03 - **0.08** - 0.15	0.03 - **0.1** - 0.15	0.03 - **0.1** - 0.15							
			≦3.5					0.03 - **0.1** - 0.2						
			≦5.0	-	-	-	-							
	Austenitic Stainless Steel		≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	0.5 - **1.2** - 1.8	☆ 100 - **160** - 200	★ 100 - **160** - 200	-	-	-	-
			≦2.0	0.06 - **0.08** - 0.15	0.06 - **0.1** - 0.2	0.06 - **0.15** - 0.2	0.06 - **0.15** - 0.2							
			≦3.5					0.06 - **0.15** - 0.3						
			≦5.0	-	-	-	-							
	Martensitic Stainless Steel		≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	0.5 - **1.2** - 1.8	-	☆ 150 - **200** - 250	-	-	-	★ 180 - **240** - 300
			≦2.0	0.06 - **0.08** - 0.15	0.06 - **0.1** - 0.2	0.06 - **0.15** - 0.2	0.06 - **0.15** - 0.2							
			≦3.5					0.06 - **0.15** - 0.3						
			≦5.0	-	-	-	-							
	Precipitation Hardened Stainless Steel		≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	0.5 - **1.2** - 1.8	-	★ 90 - **120** - 150	-	-	-	-
			≦2.0	0.06 - **0.08** - 0.15	0.06 - **0.1** - 0.2	0.06 - **0.15** - 0.2	0.06 - **0.15** - 0.2							
			≦3.5					0.06 - **0.15** - 0.3						
			≦5.0	-	-	-	-							
	Gray Cast Iron		≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0	0.5 - **1.5** - 2.0	-	-	★ 120 - **180** - 250	-	-	-
			≦2.0	0.06 - **0.1** - 0.2	0.06 - **0.15** - 0.3	0.06 - **0.2** - 0.3	0.06 - **0.2** - 0.3							
			≦3.5					0.06 - **0.2** - 0.4						
			≦5.0	-	-	-	-							
	Nodular Cast Iron		≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	0.5 - **1.2** - 1.8	-	-	★ 100 - **150** - 200	-	-	-
			≦2.0	0.06 - **0.08** - 0.15	0.06 - **0.1** - 0.2	0.06 - **0.15** - 0.2	0.06 - **0.15** - 0.2							
			≦3.5					0.06 - **0.15** - 0.3						
			≦5.0	-	-	-	-							
	Ni-base Heat-Resistant Alloy		≦1.0	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.9	0.2 - **0.6** - 1.0	0.2 - **0.8** - 1.2	0.2 - **0.8** - 1.2	-	☆ 20 - **30** - 50	-	-	-	★ 20 - **30** - 50
			≦2.0	0.03 - **0.05** - 0.1	0.03 - **0.08** - 0.15	0.03 - **0.1** - 0.15	0.03 - **0.1** - 0.15							
			≦3.5					0.03 - **0.1** - 0.2						
			≦5.0	-	-	-	-							
	Titanium Alloy		≦1.0	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.9	0.2 - **0.6** - 1.0	0.2 - **0.8** - 1.2	0.2 - **0.8** - 1.2	-	☆ 40 - **60** - 80	-	★ 40 - **60** - 80	-	-
			≦2.0	0.03 - **0.05** - 0.1	0.03 - **0.08** - 0.15	0.03 - **0.1** - 0.15	0.03 - **0.1** - 0.15							
			≦3.5					0.03 - **0.1** - 0.2						
			≦5.0	-	-	-	-							

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

Chipbreaker	Workpiece	Holder Description and Feed Rate (fz: mm/t)						Recommended Insert Grade (Vc: m/min)					
		ap (mm)	MFH25-	MFH32-	MFH40-	MFH…R-10	MFH…-14	MEGACOAT NANO EX			MEGACOAT TOUGH	MEGACOAT HARD	CVD Coated Carbide
								PR1825	PR1835	PR1810	PM335S	PR015S	CA6535
FL	Carbon Steel (SxxC)	≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0		☆ 120 - **180** - 250	★ 120 - **180** - 250	-	-	-	-
		≦1.5	0.2 - **0.4** - 0.5	0.3 - **0.7** - 1.0	0.4 - **1.0** - 1.5								
	Alloy Steel (SCM)	≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0		☆ 100 - **160** - 220	★ 100 - **160** - 220	-	-	-	-
		≦1.5	0.2 - **0.4** - 0.5	0.3 - **0.7** - 1.0	0.4 - **1.0** - 1.5								
	Mold Steel (SKD) (- 40HRC)	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		☆ 80 - **140** - 180	★ 80 - **140** - 180	-	-	-	-
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
	Die Steel (SKD) (40 - 50HRC)	≦1.0	0.15 - **0.3** - 0.5	0.2 - **0.5** - 0.8	0.2 - **0.6** - 0.9	0.2 - **0.7** - 1.0		☆ 60 - **100** - 130	★ 60 - **100** - 130	-	-	-	-
		≦1.5	0.15 - **0.2** - 0.25	0.2 - **0.3** - 0.45	0.2 - **0.5** - 0.7								
	Austenitic Stainless Steel	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		★ 100 - **160** - 200	☆ 100 - **160** - 200	-	-	-	-
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
	Martensitic Stainless Steel	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		-	☆ 150 - **200** - 250	-	-	-	★ 180 - **240** - 300
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
	Precipitation Hardened Stainless Steel	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		-	★ 90 - **120** - 150	-	-	-	-
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
	Gray Cast Iron	≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0		-	-	★ 120 - **180** - 250	-	-	-
		≦1.5	0.2 - **0.4** - 0.5	0.3 - **0.7** - 1.0	0.4 - **1.0** - 1.5								
	Nodular Cast Iron	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8		-	-	★ 100 - **150** - 200	-	-	-
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2								
	Ni-base Heat-Resistant Alloy	≦1.0	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.9	0.2 - **0.6** - 1.0	0.2 - **0.8** - 1.2		-	☆ 20 - **30** - 50	-	☆ 20 - **30** - 50	-	★ 20 - **30** - 50
		≦1.5	0.15 - **0.2** - 0.3	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.8								
	Titanium Alloy	≦1.0	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.9	0.2 - **0.6** - 1.0	0.2 - **0.8** - 1.2		-	☆ 40 - **60** - 80	-	★ 40 - **60** - 80	-	-
		≦1.5	0.15 - **0.2** - 0.3	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.8								

- The numbers shown in **bold font** indicate the recommended standard cutting conditions.
  Adjust the cutting speed and feed rate within the specified range according to the actual machining conditions.
- Machining with coolant is recommended for Precipitation Hardened Stainless Steel, Ni-base Heat-Resistant Alloy, and Titanium Alloy.
- Machining with coolant 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 25% of recommended cutting conditions.
- Center-through coolant is recommended for slotting.
- For long shank end mills, 75% or less of the recommended conditions is recommended for both D.O.C. and feed rate.

MFH Harrier-D | End Mill



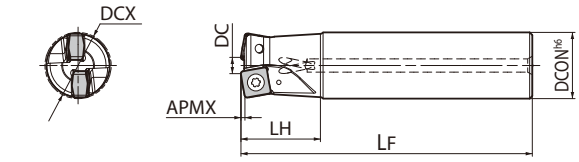


Fig.1

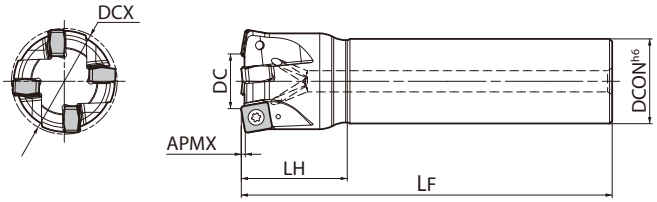


Fig.2

Toolholder dimensions

Description		Stock	No. of Inserts	Dimensions (mm)						Rake Angle	Coolant Hole	Drawing	Weight (kg)	Max. Revolution (min^{-1})
				DCX	DC	DCON	LF	LH	APMX	A.R.				
MFH	25-S25-10-2T-D	●	2	25	8.5	25	110	30	1.5	−6°	Yes	Fig.1	0.4	10,800
	32-S32-10-3T-D	●	3	32	15	32	120	40					0.6	9,600
	40-S32-10-4T-D	●	4	40	22.5		140					Fig.2	0.8	8,500

• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

MFH Harrier-D | Face Mill



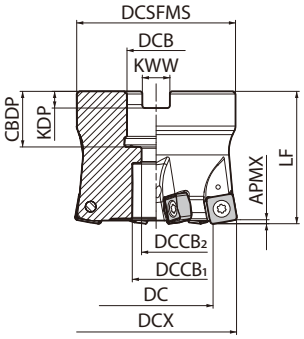


Fig.1

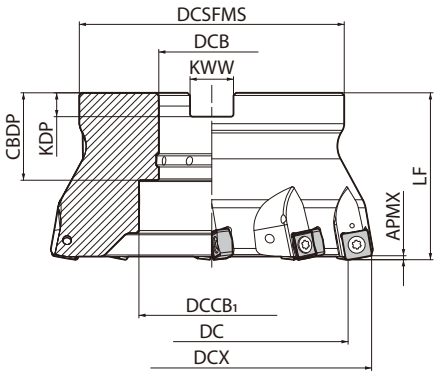


Fig.2

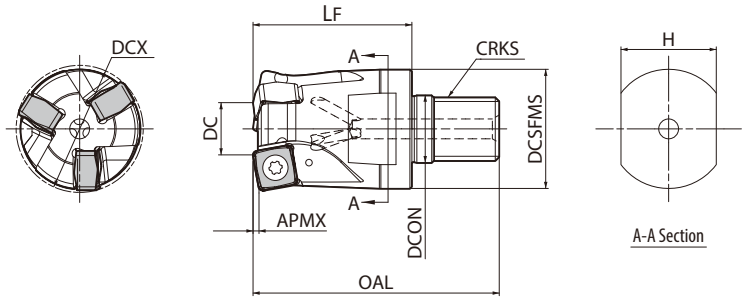
Toolholder dimensions

Bore dia.	Description		Stock	No. of Inserts	Dimensions (mm)											Rake Angle	Coolant Hole	Drawing	Weight (kg)	Max. Revolution (min^{-1})
					DCX	DC	DCS-FMS	DCB	$DCCB_2$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX	A.R.				
Inch spec	MFH	080R-10-7T-D	●	7	80	62.5	76	31.75	26	17	63	32	8	12.7	1.5	−6°	Yes	Fig.1	1.4	6,000
		100R-10-8T-D	●	8	100	82.5	96												2.5	5,400
		125R-10-10T-D	●	10	125	107.5	100	38.1	55	-		38	10	15.9				Fig.2	3.2	4,800
Metric spec	MFH	050R-10-5T-D-M	●	5	50	32.5	48	22	18	11	50	21	6.3	10.4	1.5	−6°	Yes	Fig.1	0.4	7,600
		063R-10-6T-D-M	●	6	63	45.5	60												0.8	6,800
		080R-10-7T-D-M	●	7	80	62.5	76	27	20	13	63	24	7	12.4					1.5	6,000
		100R-10-8T-D-M	●	8	100	82.5	96	32	26	17		28	8	14.4					2.5	5,400
		125R-10-10T-D-M	●	10	125	107.5	100	40	55	-		33	9	16.4				Fig.2	3.1	4,800

• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available





Toolholder dimensions

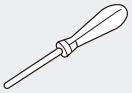
Description		Stock	No. of Inserts	Dimensions (mm)									Rake Angle	Coolant Hole	Weight (kg)	Max. Revolution (min^{-1})
				DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R.			
MFH	25-M12-10-2T-D	●	2	25	8.5	23	12.5	56	35	M12×P1.75	19	1.5	–6°	Yes	0.1	10,800
	32-M16-10-3T-D	●	3	32	15	30	17	62	40	M16×P2.0	24				0.2	9,600
	35-M16-10-3T-D	●	3	35	17.5										0.2	9,100
	40-M16-10-4T-D	●	4	40	22.5										0.2	8,500

• Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

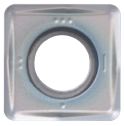
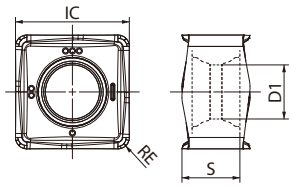
Spare Parts

Description		Insert screw	Wrench	Arbor clamp bolt
				
MFH···S···		SB-4090TRP	DTPM-15	-
MFH···M···				-
MFH	050R-10-5T-D-M			HH10x30
	063R-10-6T-D-M			
	080R-10-7T-D-M			HH12x35
	100R-10-8T-D-M			HH16x40
	125R-10-10T-D-M			-
	080R-10-7T-D			HH16x40
	100R-10-8T-D			
	125R-10-10T-D			-

Recommended torque for insert clamp 3.5N·m

MFH Harrier-D | Applicable inserts

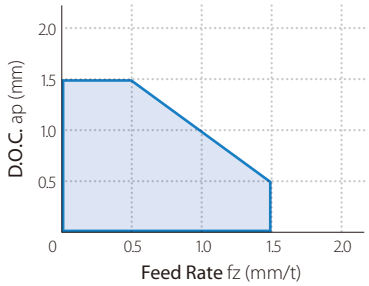
Usage classification					
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice	P	Carbon Steel/Alloy Steel	★	☆	
		Mold steel	★	☆	
	M	Austenitic stainless steel	☆	★	
		Martensitic stainless steel		☆	
		Precipitation hardened stainless steel		★	
	K	Gray Cast Iron			★
		Nodular Cast Iron			★
	S	Ni-base Heat-Resistant Alloy		☆	
		Titanium alloy		★	☆
	H	Hardened Materials			

Insert		Description	Dimensions (mm)					MEGACOAT NANO EX		
			IC	S	D1	BS	RE	PR1825	PR1835	PR1810
 General purpose		SNMU100410ER-GM	10.0	5.09	4.72	-	1.0	●	●	●

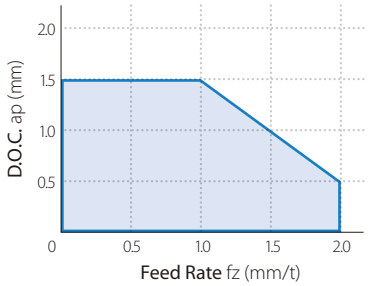
● : Available

MFH Harrier-D | Cutting Performance

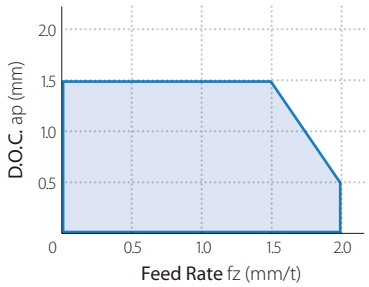
MFH25…



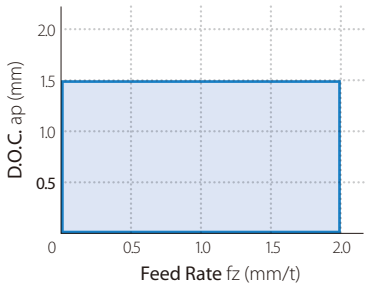
MFH32…/MFH35…



MFH40…



Face Mill



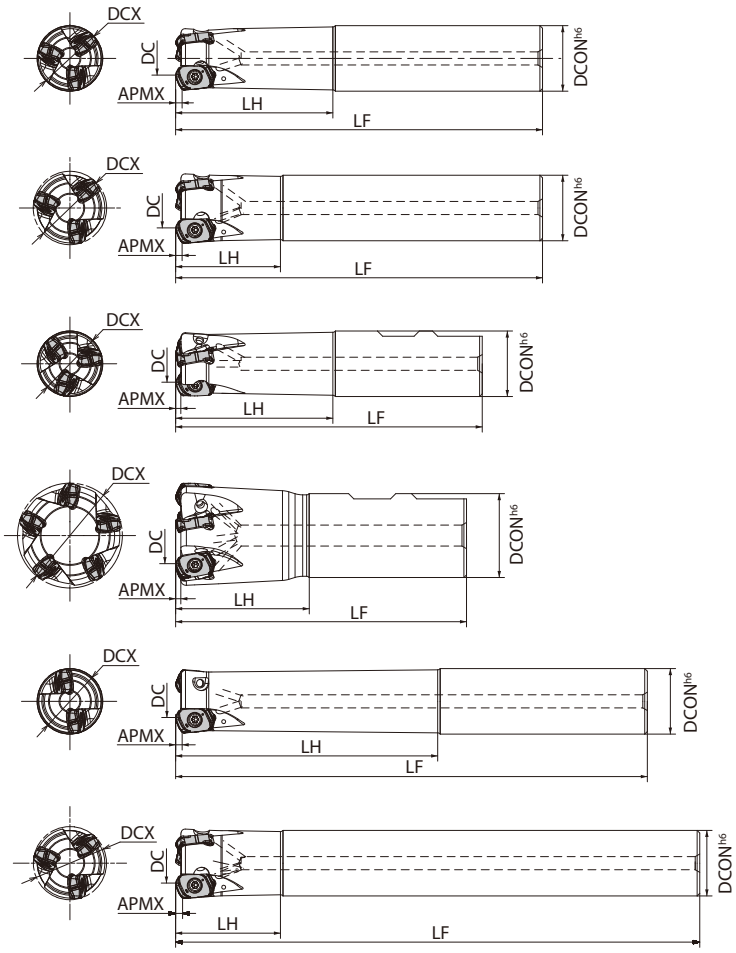
- End Mill: Please refer to the application map above.
- Face Mill: Maximum feed rate (feed per tooth) fz = 2.0mm/t

MFH Harrier-D | Recommended cutting conditions ★1st recommendation ☆2nd recommendation

Chipbreaker	Workpiece	Holder Description and Feed Rate (fz: mm/t)					Recommended Insert Grade (Vc: m/min)		
		ap (mm)	MFH25…D	MFH32…D	MFH40…D	MFH…R…	MEGACOAT NANO EX		
							PR1825	PR1835	PR1810
GM	Carbon steel	≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0	★ 120 - **180** - 250	☆ 120 - **180** - 250	-
		≦1.5	0.2 - **0.4** - 0.5	0.3 - **0.7** - 1.0	0.4 - **1.0** - 1.5	0.5 - **1.5** - 2.0			
	Alloy steel	≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0	★ 100 - **160** - 220	☆ 100 - **160** - 220	-
		≦1.5	0.2 - **0.4** - 0.5	0.3 - **0.7** - 1.0	0.4 - **1.0** - 1.5	0.5 - **1.5** - 2.0			
	Mold steel (- 40HRC)	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	★ 80 - **140** - 180	☆ 80 - **140** - 180	-
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2	0.5 - **1.2** - 1.8			
	Mold steel (40 - 50HRC)	≦1.0	0.15 - **0.3** - 0.5	0.2 - **0.5** - 0.8	0.2 - **0.6** - 0.9	0.2 - **0.7** - 1.0	★ 60 - **100** - 130	-	-
		≦1.5	0.15 - **0.2** - 0.25	0.2 - **0.3** - 0.45	0.2 - **0.5** - 0.7	0.2 - **0.7** - 1.0			
	Mold steel (50 - 55HRC)	≦1.0	0.15 - **0.25** - 0.4	0.15 - **0.35** - 0.6	0.15 - **0.4** - 0.7	0.2 - **0.5** - 0.8	★ 50 - **70** - 100	-	-
	Austenitic Stainless Steel	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	☆ 100 - **160** - 200	★ 100 - **160** - 200	-
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2	0.5 - **1.2** - 1.8			
	Martensitic Stainless Steel	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	-	★ 150 - **200** - 250	-
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2	0.5 - **1.2** - 1.8			
	Precipitation Hardened Stainless Steel	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	-	★ 90 - **120** - 150	-
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2	0.5 - **1.2** - 1.8			
	Gray Cast Iron	≦1.0	0.5 - **0.8** - 1.0	0.5 - **1.0** - 1.5	0.5 - **1.2** - 1.8	0.5 - **1.5** - 2.0	-	-	★ 120 - **180** - 250
		≦1.5	0.2 - **0.4** - 0.5	0.3 - **0.7** - 1.0	0.4 - **1.0** - 1.5	0.5 - **1.5** - 2.0			
	Nodular Cast Iron	≦1.0	0.5 - **0.7** - 0.8	0.5 - **0.8** - 1.2	0.5 - **1.0** - 1.6	0.5 - **1.2** - 1.8	-	-	★ 100 - **150** - 200
		≦1.5	0.2 - **0.3** - 0.4	0.3 - **0.6** - 0.8	0.4 - **0.8** - 1.2	0.5 - **1.2** - 1.8			
	Ni-base Heat-Resistant Alloy	≦1.0	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.9	0.2 - **0.6** - 1.0	0.2 - **0.8** - 1.2	-	★ 20 - **30** - 50	-
		≦1.5	0.15 - **0.2** - 0.3	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.8	0.2 - **0.8** - 1.2			
	Titanium Alloy	≦1.0	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.9	0.2 - **0.6** - 1.0	0.2 - **0.8** - 1.2	-	★ 40 - **60** - 80	-
		≦1.5	0.15 - **0.2** - 0.3	0.2 - **0.4** - 0.6	0.2 - **0.5** - 0.8	0.2 - **0.8** - 1.2			

- 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 25% of recommended cutting conditions. Slotting is not recommended in this situation.
- Center-through coolant is recommended for slotting.
- Slotting are not recommended for face mill types.
- For face milling, it is recommended that width of cut should be set to 75% or less of the cutting diameter.





Toolholder dimensions

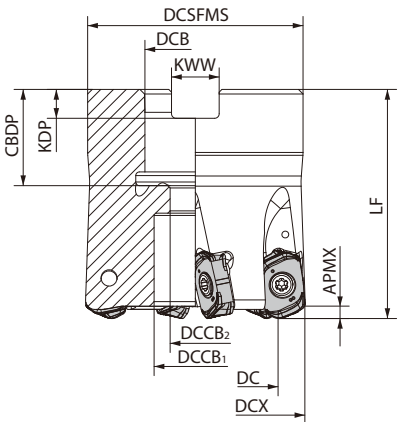
Shank	Description		Stock	No. of Inserts	Dimensions (mm)						Rake Angle	Coolant Hole	Shape	Weight (kg)	Max Revolution (min^{-1})
					DCX	DC	DCON	LH	LF	APMX	A.R.				
Standard Shank (Cylindrical)	MFH	25-S25-04-2T	●	2	25	14	25	60	140	2.5	−10°	Yes	Fig.1	0.5	12,700
		25-S25-04-3T	●	3										0.5	
		32-S32-04-4T	●	4	32	21	32	70	150					0.8	11,200
		32-S32-04-5T	●	5										0.8	
Over Size Shank (Cylindrical)	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	12,000
		28-S25-04-4T	●	4										0.5	
		35-S32-04-4T	●		35	24	32	50	150					0.8	10,700
		35-S32-04-5T	●	5										0.8	
		40-S32-04-5T	●		40	29								0.9	10,000
		40-S32-04-6T	●	6										0.9	
Standard Shank (Weldon)	MFH	25-W25-04-2T	●	2	25	14	25	60	117	2.5	−10°	Yes	Fig.3	0.4	12,700
		25-W25-04-3T	●	3										0.4	
		32-W32-04-4T	●	4	32	21	32	70	131					0.7	11,200
		32-W32-04-5T	●	5										0.7	
		40-W32-04-5T	●		40	29		50	111				Fig.4	0.7	10,000
		40-W32-04-6T	●	6										0.7	
Long Shank Shank (Cylindrical)	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	●		28	17		40	200				Fig.6	0.7	12,000
		32-S32-04-4T-200	●	4	32	21	32	120					Fig.5	1.1	11,200
		35-S32-04-4T-200	●		35	24		50					Fig.6	1.1	10,700
		40-S32-04-5T-250	●	5	40	29			250					1.5	10,000

• Caution with max. revolution

Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available





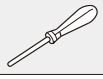
Toolholder dimensions

Bore Dia.	Description	Stock	No. of Inserts	Dimensions (mm)											Rake Angle	Coolant Hole	Weight (kg)	Max. Revolution (min^{-1})
				DCX	DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX	A.R.			
Inch Spec	MFH 080R-04-8T	●	8	80	69	76	31.75	26	17	63	32	8.0	12.7	2.5	−10°	Yes	1.6	7,100
	080R-04-10T	●	10														1.6	
Metric Spec	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	●		50	39	47	22	18	11	50	21	6.3	10.4				0.4	9,000
	050R-04-7T-M	●	7														0.4	
	052R-04-6T-M	●	6	52	41												0.5	8,800
	052R-04-7T-M	●	7														0.4	
	063R-04-7T-M	●		63	52	60											0.8	8,000
	063R-04-9T-M	●	9														0.8	
	063R-04-7T-27M	●	7				27	20	13		24	7.0	12.4				0.8	
	063R-04-9T-27M	●	9														0.7	
	080R-04-8T-M	●	8	80	69	76				63							1.8	7,100
	080R-04-10T-M	●	10														1.7	

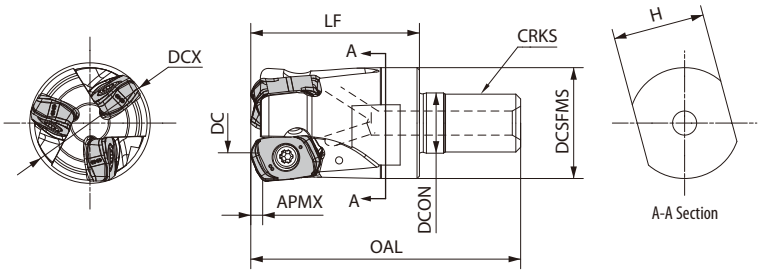
• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

Spare Parts

Description	Parts		
	Insert screw	Wrench	Arbor clamp bolt
			
MFH···-S··-04-···	SB-3575TRP	DTPM-10	-
MFH···-W··-04-···			
MFH040R-04-····-M			HH8×25
MFH050R-04-····-M			HH10×30
MFH052R-04-····-M			
MFH063R-04-····-M			
MFH063R-04-····-27M			HH12×35
MFH080R-04-····-M	Recommended torque for insert clamp 2.0N·m		
MFH080R-04-···			HH16×40
MFH···-M··-04-···			-





Toolholder dimensions

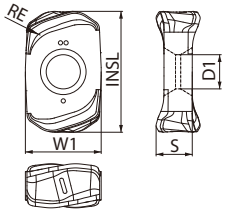
Description		Stock	No. of Inserts	Dimensions (mm)									Rake Angle	Coolant Hole	Max.Revolution (min^{-1})
				DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R.		
MFH	22-M10-04-2T	●	2	22	11	18.7	10.5	48	30	M10XP1.5	15	2.5	−10°	Yes	13,600
	25-M12-04-2T	●		25	14	23	12.5	56	35	M12XP1.75	19				12,700
	25-M12-04-3T	●	3												
	28-M12-04-3T	●		28	17										12,000
	28-M12-04-4T	●	4												
	32-M16-04-4T	●		32	21	30	17	62	40	M16XP2.0	24				11,200
	32-M16-04-5T	●	5												
	35-M16-04-4T	●	4	35	24										10,700
	35-M16-04-5T	●	5												
	40-M16-04-5T	●		40	29										10,000
	40-M16-04-6T	●	6												
	42-M16-04-5T	●	5	42	31										9,800
	42-M16-04-6T	●	6												

• Caution with max. revolution
Set the number of revolutions per minute within the recommended cutting speed for each workpiece material.
Do not use the end mill or cutter above the maximum revolution, as centrifugal force may cause inserts or components to be ejected even under no-load conditions.

● : Available

MFH Boost | Applicable inserts

Usage classification								
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice	P	Carbon Steel/Alloy Steel	★	☆			
		Mold Steel	★	☆			
	M	Austenitic Stainless Steel	☆	★			
		Martensitic Stainless Steel		☆			★
		Precipitation hardened Stainless Steel		★			
	K	Gray Cast Iron			★		
		Nodular Cast Iron			★		
	S	Ni-base Heat-Resistant Alloy		☆		☆	★
		Titanium Alloy		☆		★	
	H	Hardened Materials					

Shape		Description	Dimensions (mm)					MEGACOAT NANO EX			MEGACOAT TOUGH	CVD Coated Carbide
			W1	S	D1	INSL	RE	PR1825	PR1835	PR1810	PM335S	CA6535
 4-edge, Double-sided insert		LOMU 040410ER-GM	9.1	4.4	4.1	14.5	1.0	●	●	●	●	●

● : Available

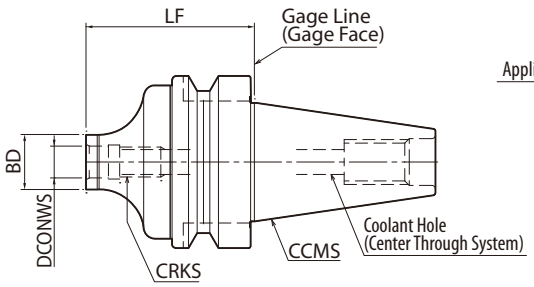
MFH Boost | Recommended cutting conditions ★1st recommendation ☆2nd recommendation

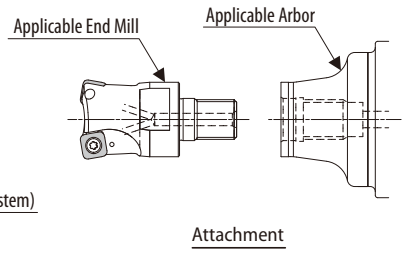
Chipbreaker	Workpiece		Toolholder description and feed (fz: mm/t)		Recommended insert grade (Vc: m/min)				
			ap(mm)	MFH…04…	MEGACOAT NANO EX			MEGACOAT TOUGH	CVD Coated Carbide
					PR1825	PR1835	PR1810	PM335S	CA6535
GM	Carbon Steel Alloy Steel	(- 280HB)	≦0.5	0.20 - **0.80** - 1.30	★ 120 - **160** - 220	☆ 120 - **160** - 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					
		(- 350HB)	≦0.5	0.20 - **0.75** - 1.20	★ 100 - **140** - 200 (Dry machining recommended)	☆ 100 - **140** - 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 - **140** - 180 (Dry machining recommended)	☆ 80 - **140** - 180 (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					
		(40 - 50HRC)	≦0.5	0.10 - **0.30** - 0.50	★ 60 - **100** - 130 (Dry machining recommended)	-	-	-	-
			≦1.0	0.10 - **0.25** - 0.40					
			≦1.5	0.10 - **0.20** - 0.30					
			≦2.0	-					
			≦2.5						
		(50 - 55HRC)	≦0.5	0.10 - **0.20** - 0.40	★ 50 - **70** - 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 - **140** - 180	★ 100 - **140** - 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 - **150** - 200	-	-	★ 150 - **200** - 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 - **120** - 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	-	-	★ 120 - **160** - 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	-	-	★ 100 - **150** - 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 - **30** - 50	-	☆ 20 - **30** - 50	★ 20 - **30** - 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	-	☆ 40 - **60** - 80	-	★ 40 - **60** - 80	-
			≦1.0	0.10 - **0.25** - 0.45					
			≦1.5	0.10 - **0.15** - 0.25					
			≦2.0	-					
			≦2.5						

- The numbers shown in **bold font** indicate the recommended standard cutting conditions. Adjust the cutting speed and feed rate within the specified range according to the actual machining conditions.
- Machining with coolant is recommended for Precipitation Hardened Stainless Steel, Ni-base Heat-Resistant Alloy, and Titanium Alloy.
- Machining with coolant 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 25% of recommended cutting conditions. Slotting is not recommended in this situation.
- Center-through coolant is recommended for slotting.
- Slotting or pocketing are not recommended for face mill types.
- For face milling, it is recommended that width of cut should be set to 75% or less of the cutting diameter.
- For long shank end mills, 75% or less of the recommended conditions is recommended for both D.O.C. and feed rate.

BT Arbor (for exchangeable head/two-face clamping)





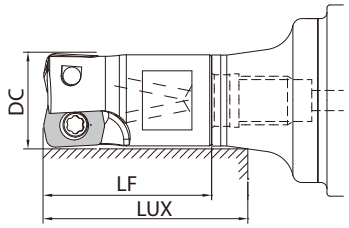


Dimension

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

● : Available

Actual end mill depth



Arbor description		Applicable end mill (Head)			Actual end mill depth(mm)
		Description	Cutting Dia.(mm)	Dimension(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
	M10-45	MFH20-M10-03…	20	30	36.8
		MFH22-M10-03…	22	30	39.2
		MFH22-M10-04…	22	30	39.2
	M12-45	MFH25-M12-…	25	35	42.8
		MFH28-M12-…	28	35	45.5
BT40K-	M08-55	MFH16-M08-01…	16	22	28.7
		MFH16-M08-03…	16	25	31.7
		MFH17-M08-03…	17	25	33.2
		MFH18-M08-03…	18	25	34.3
	M10-60	MFH20-M10-03…	20	30	38.7
		MFH22-M10-03…	22	30	44.5
		MFH22-M10-04…	22	30	44.5
	M12-55	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-M16-04…	42	40	64.0

Arbor identification system

BT30 (Arbor size) **K** (Two-face clamping spindle) **-** **M12** (Thread size for clamping) **-** **45** (Length from the gage)

Approximate Programming Radius Adjustment



MFH Micro			MFH Mini		
Programmable R. (mm)	Maximum Over Machining of Radius (mm)	Maximum No Machined Portion (mm)	Programmable R. (mm)	Maximum Over Machining of Radius (mm)	Maximum No Machined Portion (mm)
R1.0	0	0.21	R1.6 (Recommended)	0	0.39
R1.2 (Recommended)	0	0.17	R2.0	0.09	0.35
R1.5	0.08	0.1	R2.5	0.26	0.26
R2.0	0.28	0.01	R3.0	0.46	0.17

*Cutting Edge Angle for MFH Micro/MFH Mini = 12° Workpiece Side Wall Max. Inclination Angle = 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°

MFH Harrier-D			MFH Boost		
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	1.12	R1.5	0	1.42
R2.5 (Recommended)	0	1.02	R2.0	0	1.24
R3.0	0.09	0.92	R3.0 (Recommended)	0	0.87
			R3.5	0.06	0.69

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

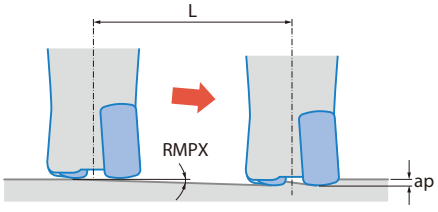
Description	Cutting Dia. DCX (mm)	50	63	80	100	125	160
MFH Harrier (MFH…-14-…)	Max. Ramping Angle RMPX	2°	1.8°	1°	0.5°	0.4°	0.2°
	tan RMPX	0.035	0.031	0.017	0.009	0.007	0.003

Description	Cutting Dia. DCX (mm)	22	25	28	32	35	40	42	50	52	63	80
MFH Boost	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

Ramping Tips

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

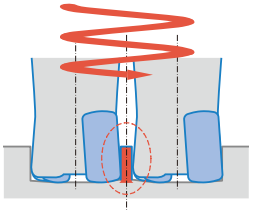


Helical Milling Tips

For Helical milling, use between Min. Drilling Dia. and Max. Drilling Dia.

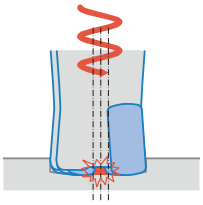
Exceeding Max. Machining Dia.

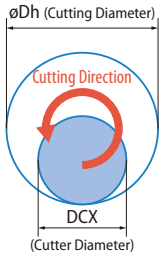
Center Core Remains After Machining



Under Min. Machining Dia.

Center Core Hits Holder Body

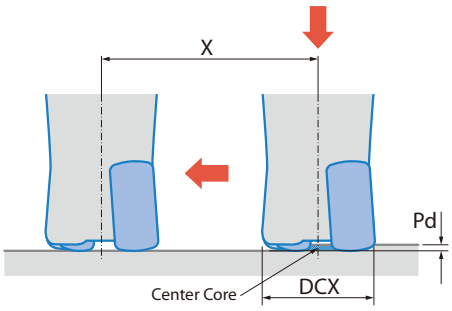




Description	Min. Cutting Dia. øDh1	Max. Cutting Dia. øDh2	Maximum Ramping Depth per Cycle
MFH Micro	2×DCX–3.5	2×DCX–2	0.5 mm
MFH Mini	2×DCX–8	2×DCX–2	1 mm
MFH Harrier (MFH…-10-…)	2×DCX–18	2×DCX–2	GM = 1.5 mm
MFH Harrier (MFH…-14-…)	2×DCX–25	2×DCX–2	GM = 2 mm
MFH Boost	2×DCX–11	2×DCX–2	2.5 mm

Keep machine depth per rotation less than max D.O.C. in cutter dimensions chart.
Use climb milling. Referto the figure above.
Feed rates should be reduced to 50% of recommended cutting conditions.
Use caution to eliminate incidences caused by producing long chips.

Drilling Tips



Description	Max. Drilling Depth Pd	Min. Cutting Length X for Flat Bottom Surface
MFH Micro	0.5	DCX-3.5
MFH Mini	1.0	DCX-9
MFH Boost	0.6	DCX-12

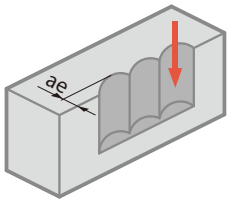
Unit: mm

Description	GM • GH		LD		FL	
	Max. Drilling Depth Pd	Min. Cutting Length X for Flat Bottom Surface	Max. Drilling Depth Pd	Min. Cutting Length X for Flat Bottom Surface	Max. Drilling 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 < 0.2mm/rev.

Plunging



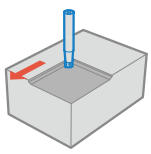
Reduce feed rate to fz ≤ 0.2mm/t when plunging.

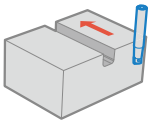
Unit: mm

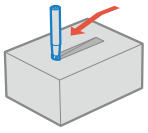
Description	Maximum Width of Cut (ae)
MFH Micro	1.7
MFH Mini	3.5
MFH Harrier (MFH…-10-…)	8 (GM • GH)
MFH Harrier (MFH…-14-…)	11.5 (GM • GH)
MFH Harrier-D	8
MFH Boost	5

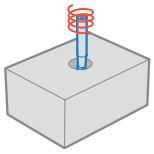
3D Machining (MFH Harrier)

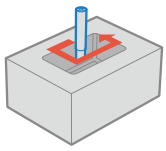
GM and GH chipbreakers are available for all the applications.

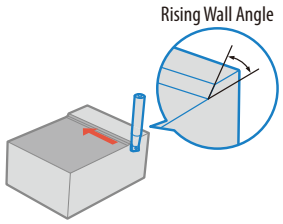

Face Milling & Shouldering


Slotting


Ramping


Helical Milling


Pocketing



Contouring

For Using MFH Harrier

Insert	Ramping	Contouring (Rising Wall Angle)	Plunging	Helical Milling	Pocketing
GM • GH	✓	✓ (90°)	✓	✓	✓
LD	✓	Limit (65°)	×	×	×
FL	✓	Limit (80°)	×	×	×

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

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