KYOCERA

# MFH-RAPTOR

## High Feed Milling Series

## Stable Machining with Greater Chatter Resistance

**Reduce Cycle Time During Roughing Applications**

**Multi-Functional for Various Applications**

**MFH Mini / Micro High Feed Mills for Small Machining Centers**

NEW **MFH-MAX**

*Small Diameter/ Larger Depth of Cut*

Ø1.000"~Ø3.000" | Ø22mm~Ø80mm

**MFH-RAPTOR**

*Large Diameter*

Ø1.000"~Ø6.000" | Ø25mm~Ø160mm

**MFH-RAPTOR MiNi**

*Small Diameter/ Fine Pitch Type*

Ø0.625"~Ø2.000" | Ø16mm~Ø50mm

**MFH-RAPTOR MiCRO**

*Micro Diameter*

Ø0.375"~Ø0.625" | Ø8mm~Ø16mm

# MFH Series

Product Video

View Online

## Convex Cutting Edge Design Reduces Chatter for High-Efficiency Rough Machining

Large Tooling Lineup to Cover a Wide Application Range for Multiple Metalworking Processes

NEW **MFH-MAX** P4

*Small Diameter/ Larger Depth of Cut*

Ø1.000"~Ø3.000" | Ø22mm~Ø80mm

**MFH-RAPTOR** P12

*Large Diameter*

Ø1.000"~Ø6.000" | Ø25mm~Ø160mm

**MFH-RAPTOR MiNi** P23

*Small Diameter/ Fine Pitch Type*

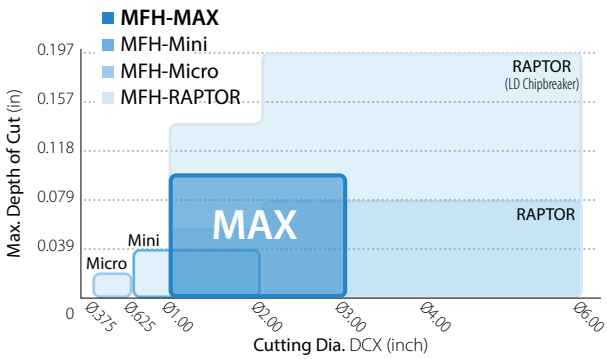
Ø0.625"~Ø2.000" | Ø16mm~Ø50mm

**MFH-RAPTOR MiCRO** P30

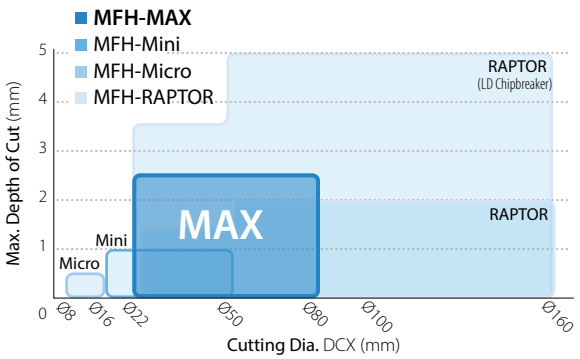
*Micro Diameter*

Ø0.375"~Ø0.625" | Ø8mm~Ø16mm

**MFH-Series Inch Diameter Range**




**MFH-Series Metric Diameter Range**




## 1 Reduced Chattering with Convex Cutting Edge Design

### Reduces Cutting Forces at Initial Impact with a Convex Helical Edge Design

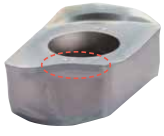
Cutting Force and Vibration when Approaching the Workpiece (D.O.C. = Half of Cutter Diameter)

**Convex Edge Design**

**MFH Micro**
LPGT Insert

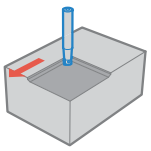
**MFH Mini**
LOGU Insert

**MFH**
SOMT Insert

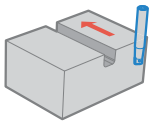


**MFH-MAX**
LOMU Insert

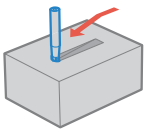
## 2 Wide Application Range for Multiple Metalworking Processes



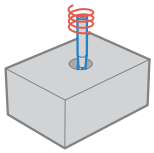
Face Milling & Shouldering



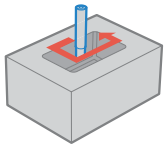
Slotting



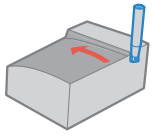
Ramping



Helical Milling



Pocketing



Contouring

For Using MFH:
**GM** and **GH** chipbreakers are available for all the above applications. **LD** and **FL** chipbreakers are not available for helical milling, plunging and contouring of rising wall. (Refer to **Page 35**)

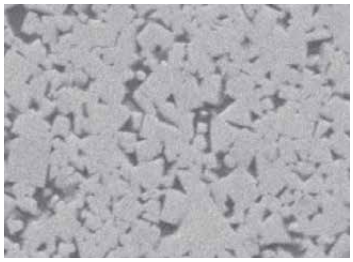
# PR1535
**MEGACOAT NANO**

MEGACOAT NANO Grade PR1535 for stable machining of difficult-to-cut materials such as heat-resistant alloy, titanium alloy and precipitation hardened stainless steel

## 1 23% Improved Fracture Toughness

An increase in cobalt content yields a substrate with greater toughness. Fracture toughness values are improved by 23% over previous grades.

**High Toughness Carbide Base Material**

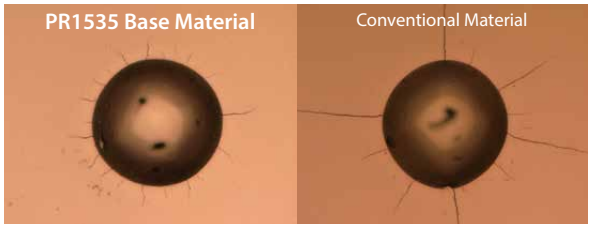


23% Fracture Toughness

## 2 Stability Improvement

The coarse grain structure and uniform particle size correspond to improved heat resistance, with conductivity values decreased by 11%. The uniform structure also reduces crack propagation.

**Cracking Comparison by Diamond Indenter** (In-house Evaluation)




Shock Resistance

**Short Cracks**
(High Impact Improvement)

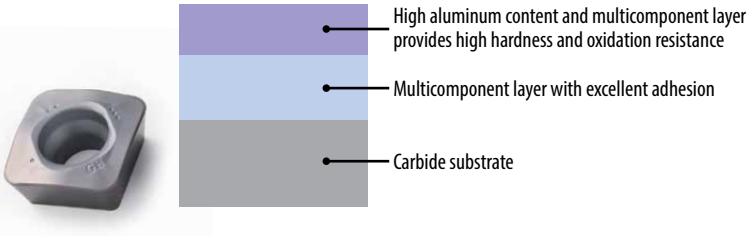
**Long Cracks**

# PR015S NEW
**MEGACOAT HARD**

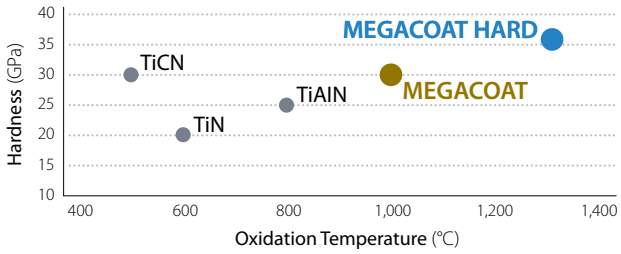
Thermal property of the substrate reduces cracks and notch wear with a high hardness and heat-resistant coating for improved wear resistance when machining in hardened materials

## MEGACOAT HARD Improves Wear Resistance with High Hardness and High Heat-resistant PVD Layer

Coating Pattern Diagram



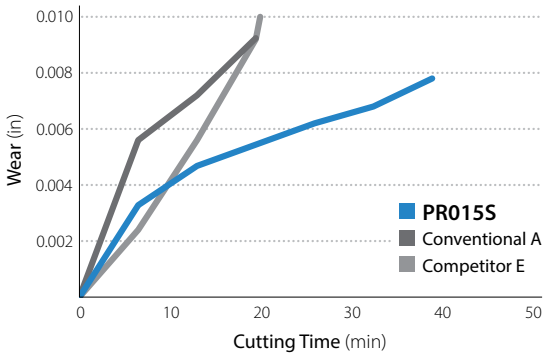

Coating Properties (Internal Evaluation)




Low Oxidation Resistance High

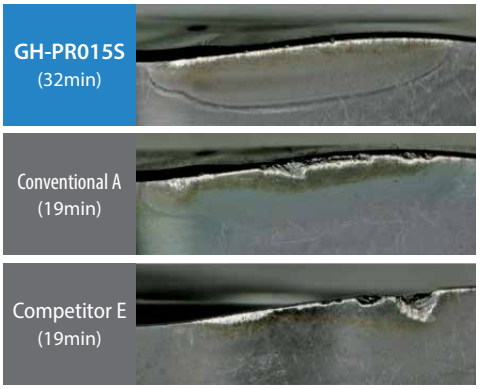
**Combining GH chipbreaker and grade PR015S reduces heat cracking and improves fracture resistance for stable machining in hardened material**

Cutting Performance Comparison (Internal Evaluation)




Cutting Conditions:
Vc = 165 sfm,
fz = 0.008ipt,
D.O.C. = 0.039" × 1.240",
Wet
SOMT140520ER-GH
Competitor Tough Edge Chipbreaker (Flat type)
Workpiece: D2 (55HRC)

Cutting Edge



# MFH-MAX NEW

(Cutter Dia. Ø1.000" ~ Ø3.000")
(Cutter Dia. Ø22mm ~ Ø80mm)

Product Video

View Online

## High Feed Milling with a Larger Depth of Cut

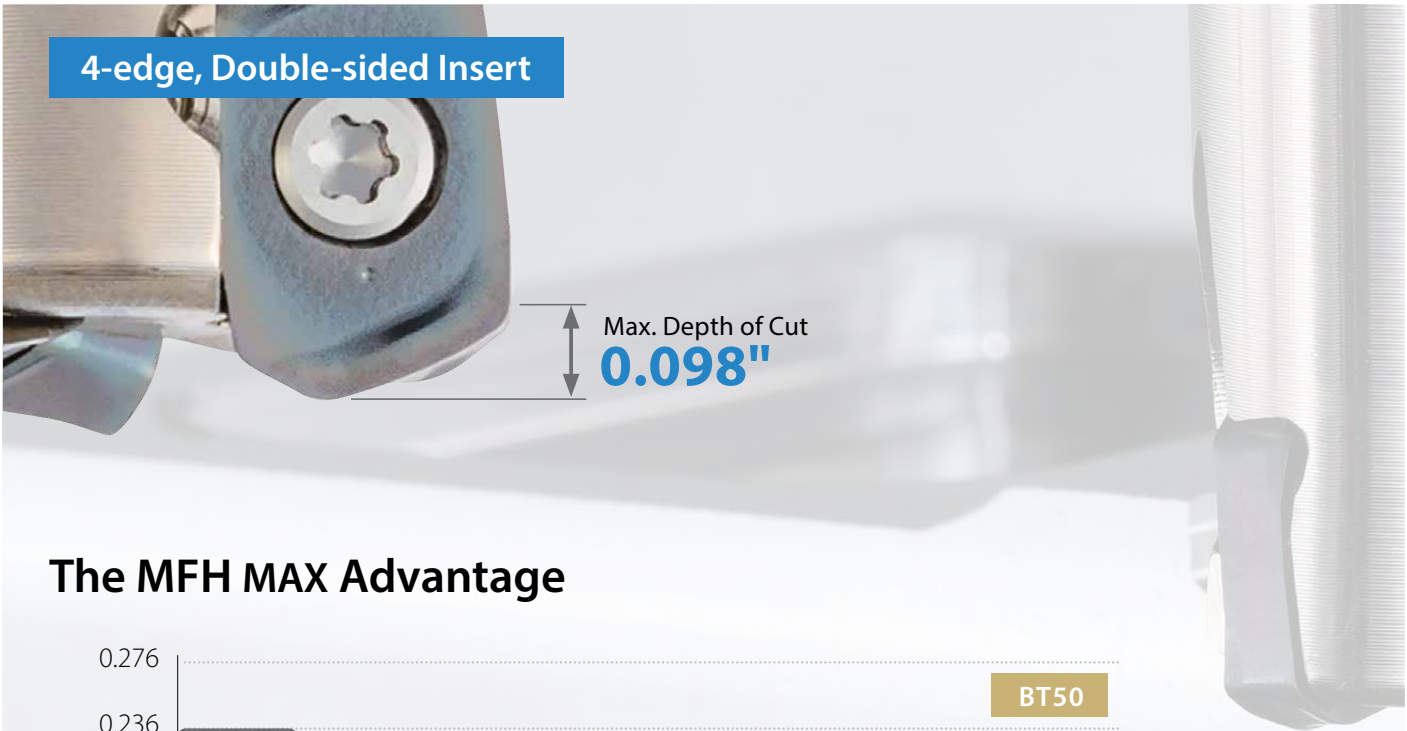
Newest Addition to the MFH High Feed Milling Family with Larger D.O.C. Capabilities

Excellent Performance in Various Applications, including Automotive Parts, Difficult-to-cut Materials, and Mold Machining

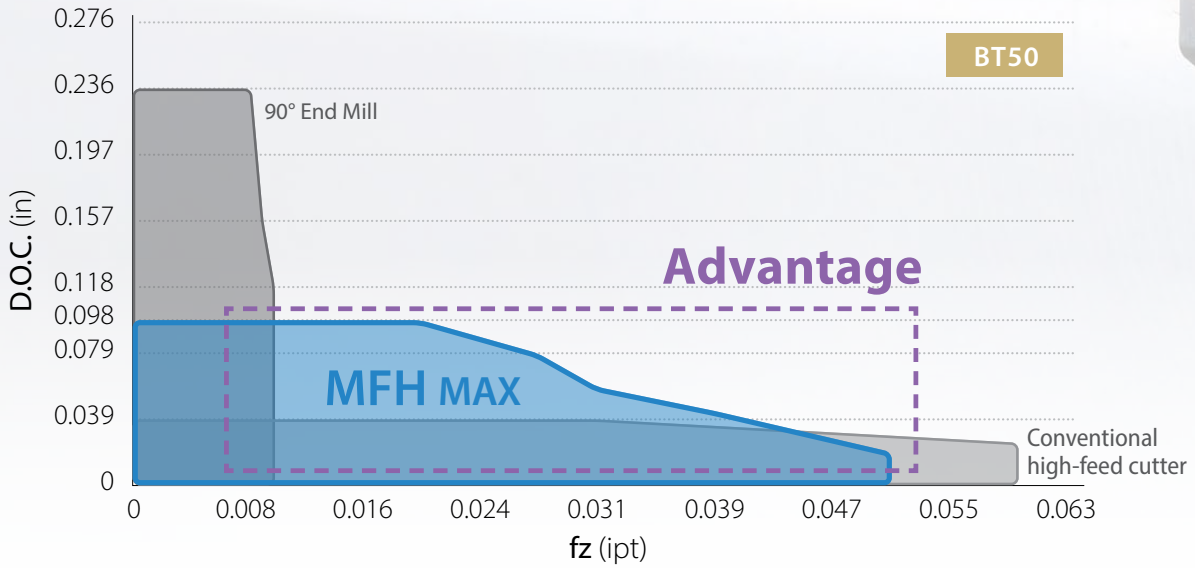
## 1 High Feed Milling with Large Depth of Cut Capabilities

**A small 4-edge, double-sided insert supports depths of cut up to 0.098" (2.5mm) with cutting diameters available from Ø1.000" and Ø22mm.**

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




## The MFH MAX Advantage




Vc = 490 sfm, ae = 0.492" (ae/DCX = 50%), 1049 Dry Ø1.000" Overhang length 2.362" BT50

# Higher Efficiency at 0.098" Max. Depth of Cut

## 1 Better Alternative to Conventional 90° End Mills (Roughing to Medium-Finishing)

Automotive Suspension Parts

### Automotive Parts

General Steel Machining

- **Increased productivity with large D.O.C. machining**
- **High reliability in unstable machining environments**
  Long overhang length and better clamping rigidity
  Stable machining with low rigidity machines
- **High-efficiency ramping**
  Large ramping angle (Small dia. Ø25mm: 3°)
  Dramatic efficiency improvement when ramping in pockets
- **Longer tool life**

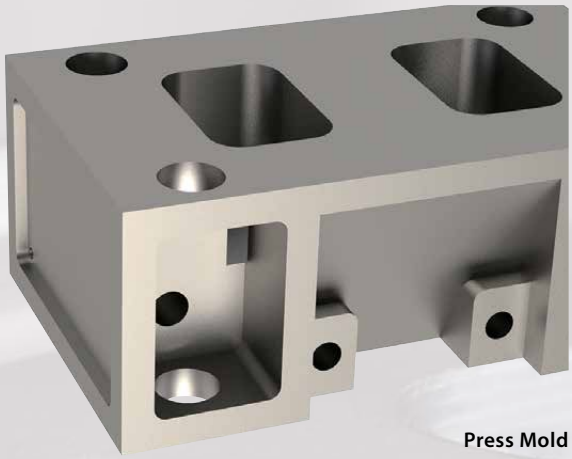
## 2 More Capabilitites than Conventional High Feed Cutters

### General Parts/Molds (Roughing/Facing)

General Parts, Pressing and Die Casting

- **Higher productivity with larger 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/RAPTOR recommended for contouring with small depth of cut and high feed



Press Mold

## 3 Excellent Solution for Machining Difficult-to-cut Materials

Aircraft Landing Gear Parts

### Aircraft/Energy Industry Parts

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

- **High feed rates increase productivity**
- **Long tool life through the reduction of tool paths**
- **Heat-resistant grade PR1535 provides long tool life and stable machining**

# Improve Productivity and Reduce Machining Costs

# 2 The MFH-MAX can cover a Large Variety of Machining Applications and Environments

## 1 A Better Alternative to 90° End Mills (Rough to Medium-Finish Machining)

### High Feed Rates Dramatically Improve Machining Efficiency

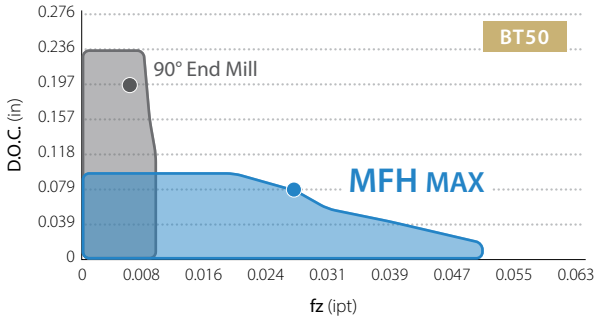
#### Machining Efficiency Simulation Example

Pocketing: Vc = 490 m/min, ae = 0.492"

**MFH MAX**
Ø1.000" (3 Flute)
**100 cc/min**
D.O.C. = **0.079"**, fz = **0.028** ipt

Machining Efficiency x 1.8

Conventional 90° End Mill
Ø1.000" (3 Flute)
**54 cc/min**
D.O.C. = **0.197"**, fz = **0.006** ipt



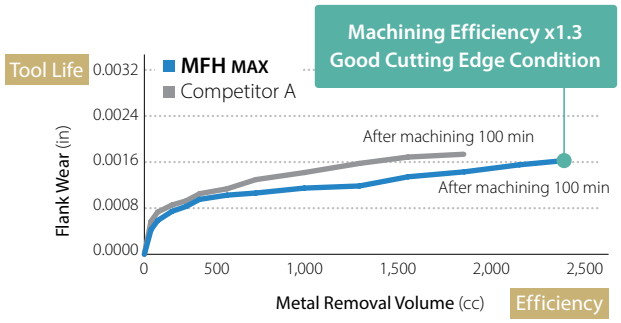

### High Efficiency and Good Tool Life

#### Machining Efficiency and Cutting Edge Condition Comparison (Internal Evaluation)

**Cutting edge condition after machining 100 min**

**MFH MAX**
D.O.C = 0.063", fz = 0.024 ipt

Competitor A 90° End Mill
D.O.C. = 0.197", fz = **0.006** ipt




Vc = 490 sfm, ae = 0.492", Dry 4140Ⓗ Ø1.000" BT50

### Higher Stability in Unstable Machining Environment

#### Chatter Resistance Comparison (Internal evaluation)

**Slotting**
Ø1.000" (3 Flute)
External air
1049
BT50

**Video**


#### Machining Efficiency

**MFH MAX**
**103 cc/min**
Vc = 390 sfm, D.O.C. = 0.059", fz = **0.024** ipt

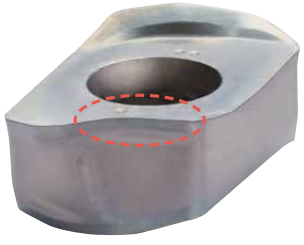
Machining Efficiency x 4.5

Competitor A
90 ° End Mill
**31 cc/min** **Chattering (Machining was impossible)**
Vc = 260 sfm, D.O.C. = 0.079", fz = 0.008 ipt

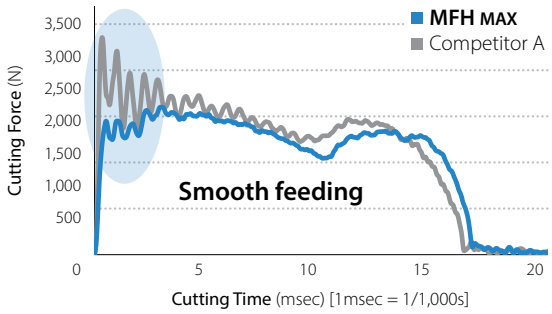
**23 cc/min**
Vc = 260 sfm, D.O.C. = 0.079", fz = 0.006 ipt

## Innovative Insert Design

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



Cutting Force when Entering Workpiece (Internal Evaluation)




Vc = 490 sfm, D.O.C. = 0.079",
ae = 1.000", fz = 0.028 ipt,
Dry 1049 Ø2.000" BT50

## 2 When Compared to Conventional High Feed Cutters

### A Larger D.O.C. Dramatically Improves Machining Efficiency

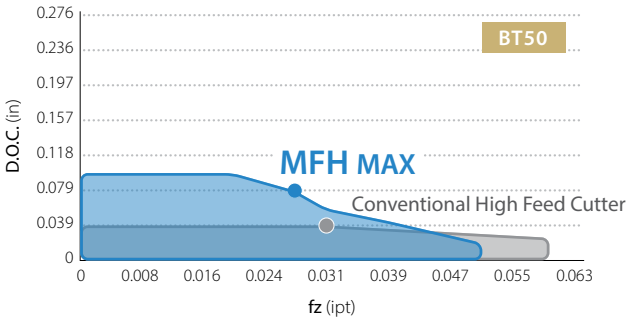
#### Machining Efficiency Simulation Example

Multistage Machining (Depth 1.181"): Vc = 490 sfm, ae = 0.492"

**MFH MAX**
Ø1.000" (3 Flute)
**100 cc/min**
D.O.C. = 0.079", fz = **0.028** ipt

Machining Efficiency x 1.3

Conventional High Feed Cutter
Ø1.000" (3 Flute)
**76 cc/min**
D.O.C. = **0.039"**, fz = **0.031** ipt



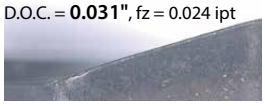

### High Efficiency and Good Tool Life

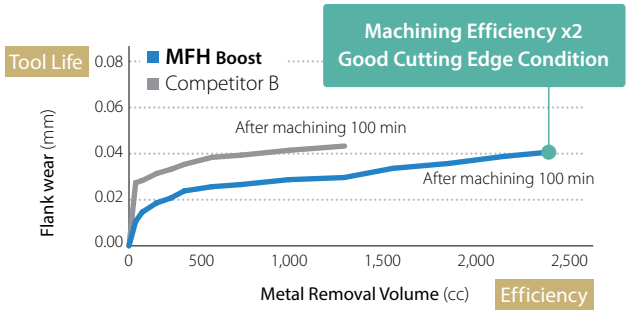
#### Machining Efficiency and Cutting Edge Condition Comparison
(Internal Evaluation)

**Cutting Edge Condition after 100 min machining**

**MFH MAX**
D.O.C. = 0.063", fz = 0.024 ipt

Competitor B High Feed Type
D.O.C. = **0.031"**, fz = 0.024 ipt






Vc = 490 sfm, ae = 0.492", Dry 4140 Ø1.000" BT50

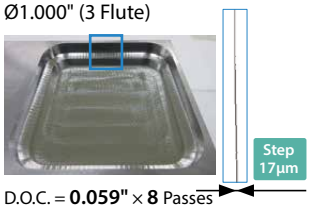
### Excellent Wall Accuracy

Video

#### Machining Efficiency and Wall Comparisons
(Internal Evaluation)

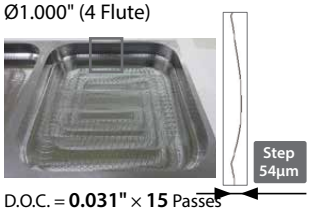
Pocketing (Depth 0.472")

**MFH MAX**
Ø1.000" (3 Flute)




D.O.C. = **0.059"** × **8** Passes
Q = 115 cc/min

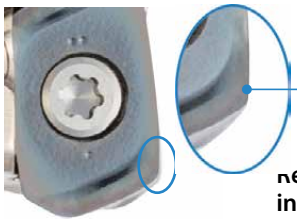
Competitor B High Feed Type
Ø1.000" (4 Flute)




D.O.C. = **0.031"** × **15** Passes
Q = **81** cc/min

Cutting Conditions: Vc = 660 sfm, ae = 0.492", fz = 0.031 ipt, Dry 1049 BT50

**Superior Wall Accuracy**



Wiper on outer periphery

**Reduction of wall level variation in multi-pass machining**

## 3 A Powerful Tool for Difficult-to-cut Materials

Video

### The MFH-MAX gained dramatic improvements in efficiency when machining titanium alloy, stainless steel, etc.

#### Machining Efficiency Comparison (Internal Evaluation)

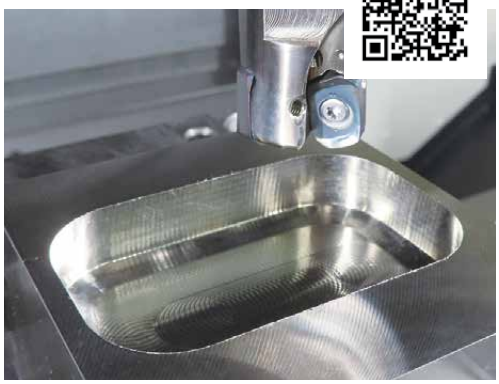
Titanium Alloy Pocketing (Depth 0.236")

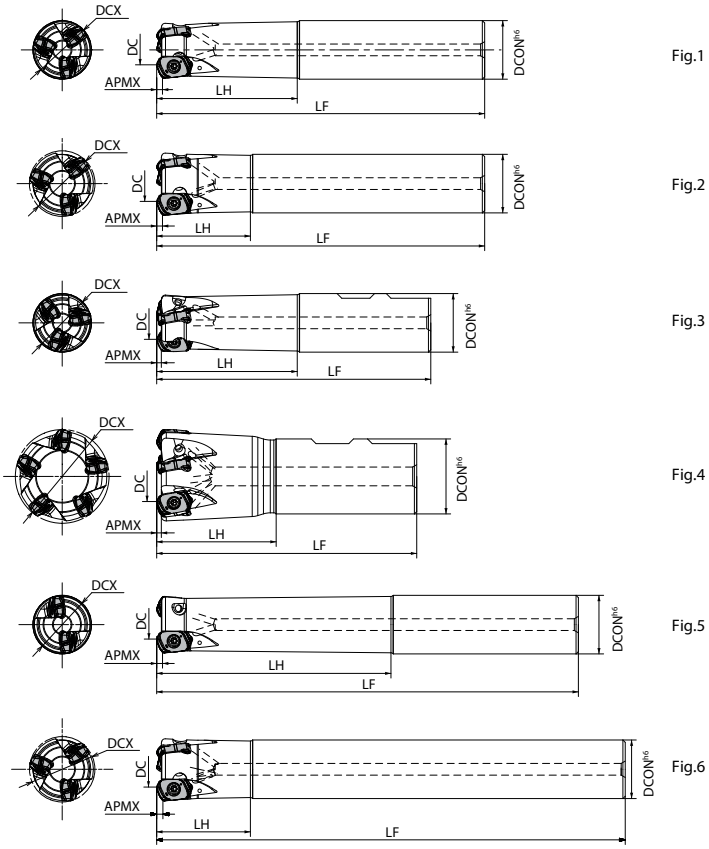
**MFH MAX**
**Approx. 1' 30"**
D.O.C. = **0.059"** × **4** Passes (fz = ~0.014 ipt)

Machining Efficiency x 1.8

Competitor C High Feed Type
**Approx. 2' 50"**
D.O.C. = **0.024"** × **10** Passes (fz = ~0.016 ipt)

Vc = 160 sfm, ae = 0.492" (ae/DCX = 50%), Ramping Angle 3° Ti-6Al-4V Wet Ø1.000" (3 Flute) BT50



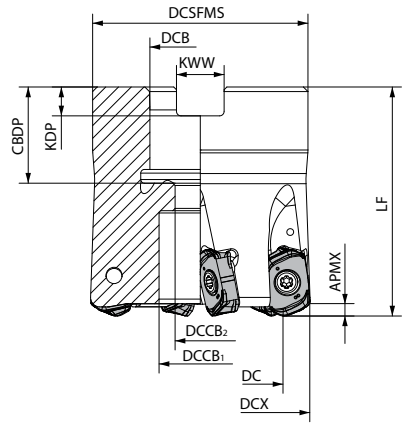



## Toolholder Dimensions

| Part Number | | | Stock | Unit | No. of Inserts | Dimensions | | | | | | Rake Angle | Coolant Hole | Drawing | Weight (kg) | Max. Revolution (RPM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | DCX | DC | DCON | LH | LF | APMX | A.R. | | | | |
| Cylindrical | Standard Shank | MFH 1000-S100-04-3T | ● | inch | 3 | 1.000 | 0.567 | 1.000 | 2.500 | 5.500 | 0.098 | -10° | Yes | Fig.1 | 0.4 | 12,500 |
| | | 1250-S125-04-5T | ● | | 5 | 1.250 | 0.817 | 1.250 | 2.750 | 6.000 | | | | | 0.7 | 11,000 |
| | Long Shank | MFH 1000-S100-04-3T-7 | ● | inch | 3 | 1.000 | 0.567 | 1.000 | 4.000 | 7.000 | 0.098 | -10° | Yes | Fig.5 | 0.7 | 12,500 |
| | | 1250-S125-04-4T-8 | ● | | 4 | 1.250 | 0.817 | 1.250 | 4.750 | 8.000 | | | | | 1.1 | 11,000 |
| Weldon | Standard Shank | MFH 1000-W100-04-3T | ● | inch | 3 | 1.000 | 0.567 | 1.000 | 2.000 | 4.600 | 0.098 | -10° | Yes | Fig.3 | 0.4 | 12,500 |
| | | 1250-W125-04-5T | ● | | 5 | 1.250 | 0.817 | 1.250 | 2.750 | 5.150 | | | | | 0.7 | 11,000 |
| Cylindrical | Standard Shank | MFH 25-S25-04-2T | ● | mm | 2 | 25 | 14 | 25 | 60 | 140 | 2.5 | -10° | Yes | Fig.1 | 0.5 | 12,700 |
| | | 25-S25-04-3T | ● | | 3 | | | | | | | | | | 0.5 | 12,700 |
| | | 32-S32-04-4T | ● | | 4 | 32 | 21 | 32 | 70 | 150 | | | | | 0.8 | 11,200 |
| | | 32-S32-04-5T | ● | | 5 | | | | | | | | | | 0.8 | 11,200 |
| | Oversize | MFH 22-S20-04-2T | ● | mm | 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 | 12,000 |
| | | 35-S32-04-4T | ● | | | 35 | 24 | 32 | 50 | 150 | | | | | 0.8 | 10,700 |
| | | 35-S32-04-5T | ● | | 5 | | | | | | | | | | 0.8 | 10,700 |
| | | 40-S32-04-5T | ● | | | 40 | 29 | | | | | | | | 0.9 | 10,000 |
| | | 40-S32-04-6T | ● | | 6 | | | | | | | | | | 0.9 | 10,000 |
| | Long Shank | MFH 25-S25-04-2T-180 | ● | mm | 2 | 25 | 14 | 25 | 100 | 180 | 2.5 | -10° | Yes | Fig.5 | 0.6 | 12,700 |
| | | 25-S25-04-3T-180 | ● | | 3 | | | | | | | | | | 0.6 | 12,700 |
| | | 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 |
| Weldon | Standard Shank | MFH 25-W25-04-2T | ● | mm | 2 | 25 | 14 | 25 | 60 | 117 | 2.5 | -10° | Yes | Fig.3 | 0.4 | 12,700 |
| | | 25-W25-04-3T | ● | | 3 | | | | | | | | | | 0.4 | 12,700 |
| | | 32-W32-04-4T | ● | | 4 | 32 | 21 | 32 | 70 | 131 | | | | | 0.7 | 11,200 |
| | | 32-W32-04-5T | ● | | 5 | | | | | | | | | | 0.7 | 11,200 |
| | | 40-W32-04-5T | ● | | | 40 | 29 | | 50 | 111 | | | | Fig.4 | 0.7 | 10,000 |
| | | 40-W32-04-6T | ● | | 6 | | | | | | | | | | 0.7 | 10,000 |

**Caution with Max. Revolution**
Set the number of revolutions per minute within the recommended cutting speed on P11
When running an end mill or a cutter at the maximum revolution, the insert or the cutter may be damaged by centrifugal force.

● : Standard Item




## Toolholder Dimensions

| | Part Number | Stock | Unit | No. of Inserts | Dimensions | | | | | | | | | | | Rake Angle | Coolant Hole | Weight (kg) | Max. Revolution (RPM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DCX | DC | DCSFMS | DCB | $DCCB_1$ | $DCCB_2$ | LF | CBDP | KDP | KWW | APMX | A.R. | | | |
| Inch Bore | MFH 1500R-04-6T | ● | inch | 6 | 1.500 | 1.067 | 1.400 | 0.500 | 0.433 | 0.276 | 1.575 | 0.709 | 0.156 | 0.250 | 0.098 | -10° | Yes | 0.2 | 10,200 |
| | 2000R-04-7T | ● | | 7 | 2.000 | 1.567 | 1.750 | 0.750 | 0.669 | 0.433 | 1.969 | 0.947 | 0.188 | 0.313 | | | | 0.5 | 8,600 |
| | 2500R-04-9T | ● | | 9 | 2.500 | 2.067 | 2.250 | | | | | 0.750 | | | | | | 0.7 | 8,000 |
| | 3000R-04-10T | ● | | 10 | 3.000 | 2.567 | 2.750 | 1.000 | 0.866 | 0.551 | 2.480 | 1.063 | 0.236 | 0.375 | | | | 1.3 | 7,500 |
| | MFH 080R-04-8T | ● | mm | 8 | 80 | 69 | 76 | 1.250" | 26 | 17 | 63 | 1.260" | 0.315" | 0.500" | 2.5 | -10° | Yes | 1.6 | 7,100 |
| | 080R-04-10T | ● | | 10 | | | | | | | | | | | | | | 1.6 | |
| Metric Bore | MFH 040R-04-5T-M | ● | mm | 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 on **P10**
When running an end mill or a cutter at the maximum revolution, the insert or the cutter may be damaged by centrifugal force.

● : Standard Item

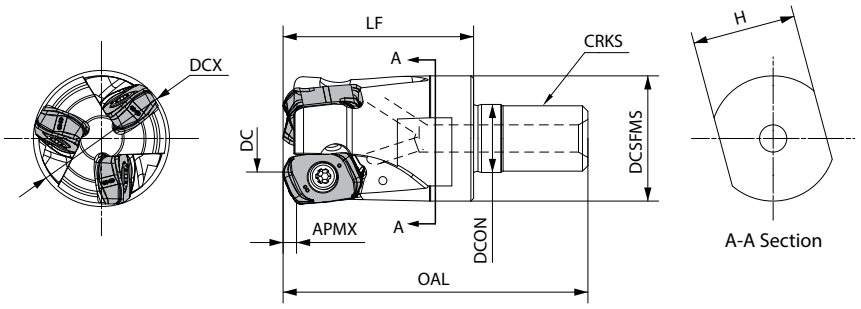
## Spare Parts and Applicable Inserts

| Part Number | | | Spare Parts | | | | Applicable Inserts P10 |
|---|---|---|---|---|---|---|---|
| | | | Insert Screw | Wrench | Anti-Seize Compound | Arbor Bolt | |
| End Mills | | MFH …-04-… | SB-3575TRP | DTPM-10 | P-37 | - | LOMU040410ER-GM |
| Face Mills | Inch Bore | MFH 1500R-04-6T | SB-3575TRP | DTPM-10 | P-37 | HH1/4-0.75(H) | |
| | | 2000R-04-7T | | | | HH3/8-1.25(H) | |
| | | 2500R-04-9T | | | | HH3/8-1.25(H) | |
| | | 3000R-04-10T | | | | HH1/2-1.25(H) | |
| | | MFH 080R-04-...-8T | | | | HH16X40(H) | |
| | | 080R-04-...-10T | Recommended torque for insert screw 2.0 Nm | | | HH16X40(H) | |
| | Metric Bore | MFH 040R-04-…-M | SB-3575TRP | DTPM-10 | P-37 | HH8X25(H) | |
| | | 050R-04-…-M | | | | HH10X30(H) | |
| | | 052R-04-...-M | | | | HH10X30(H) | |
| | | 063R-04-...-M | | | | HH10X30(H) | |
| | | 080R-04-...-M | | | | HH12X35(H) | |
| Modular End Mills | | MFH …-04-… | SB-3575TRP | DTPM-10 | P-37 | - | |

(H) Optional coolant-through bolt available

Recommended Cutting Conditions P11

# MFH-MAX | Modular End Mill (Metric Size) NEW



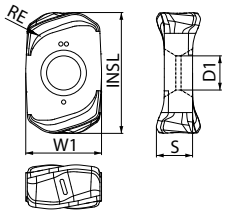

## Toolholder Dimensions

| Part Number | Stock | Unit | No. of Inserts | Dimensions | | | | | | | | | Rake Angle | Coolant Hole | Max. Revolution (RPM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | DCSFMS | DCON | OAL | LF | CRKS | H | APMX | A.R. | | |
| MFH 1000-M12-04-3T | ● | inch | 3 | 1.000 | 0.567 | 0.900 | 0.492 | 2.205 | 1.380 | M12xP1.75 | 0.748 | 0.098 | -10° | Yes | 12,500 |
| 1250-M16-04-5T | ● | | 5 | 1.250 | 0.817 | 1.180 | 0.669 | 2.441 | 1.580 | M16xP2.0 | 0.945 | | | | 11,000 |
| MFH 22-M10-04-2T | ● | mm | 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 | | | | | | | | | | 11,200 |
| 32-M16-04-5T | ● | | 5 | | | | | | | | | | | | |
| 35-M16-04-4T | ● | | 4 | 35 | 24 | 30 | 17 | 62 | 40 | M16XP2.0 | 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 on **P10**
When running an end mill or a cutter at the maximum revolution, the insert or the cutter may be damaged by centrifugal force.

● : Standard Item

# MFH-MAX | Applicable Inserts

| Insert | | Part Number | Dimensions (in) | | | | | MEGACOAT NANO | | | CVD Coating |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | W1 | S | D1 | INSL | RE | PR1535 | PR1525 | PR1510 | CA6535 |
|  4-Edge Double-Sided |   | LOMU 040410ER-GM | 0.358 | 0.173 | 0.161 | 0.571 | 0.039 | ● | ● | ● | ● |

● : Standard Item

## Insert Grade:

**PR1535** For Steel Machining (Stability Oriented Machining), Titanium Alloy, Austenitic/Precipitation Hardened Stainless Steel, etc.
**PR1525** For Steel Machining (General Use)
**PR1510** For Cast Iron Machining
**CA6535** For Martensitic Stainless Steel, Ni-base Heat-Resistant Alloy, etc.

Recommended Cutting Conditions **P11**

| Chipbreaker | Workpiece | | Holder Part Number and Feed Rate (fz: ipt) | | Recommended Insert Grade (Vc: sfm) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | D.O.C. (in) | MFH…04… | MEGACOAT NANO | | | CVD Coating |
| | | | | | PR1535 | PR1525 | PR1510 | CA6535 |
| GM | Carbon Steel Alloy Steel | (~ 280HB) | ≤ 0.020 | 0.008 – **0.032** – 0.051 | ☆ 390 – **520** – 720 | ★ 390 – **520** – 720 | – | – |
| | | | ≤ 0.039 | 0.008 – **0.028** – 0.043 | | | | |
| | | | ≤ 0.059 | 0.008 – **0.024** – 0.032 | | | | |
| | | | ≤ 0.079 | 0.008 – **0.016** – 0.028 | | | | |
| | | | ≤ 0.098 | 0.008 – **0.012** – 0.020 | | | | |
| | | (~ 350HB) | ≤ 0.020 | 0.008 – **0.030** – 0.047 | ☆ 330 – **490** – 660 (Dry Machining Recommended) | ★ 330 – **490** – 660 (Dry Machining Recommended) | – | – |
| | | | ≤ 0.039 | 0.008 – **0.026** – 0.039 | | | | |
| | | | ≤ 0.059 | 0.008 – **0.022** – 0.028 | | | | |
| | | | ≤ 0.079 | 0.008 – **0.016** – 0.022 | | | | |
| | | | ≤ 0.098 | 0.008 – **0.010** – 0.014 | | | | |
| | Mold Steel | (~ 40HRC) | ≤ 0.020 | 0.008 – **0.024** – 0.043 | ☆ 260 – **390** – 520 (Dry Machining Recommended) | ★ 260 – **390** – 520 (Dry Machining Recommended) | – | – |
| | | | ≤ 0.039 | 0.008 – **0.020** – 0.035 | | | | |
| | | | ≤ 0.059 | 0.008 – **0.016** – 0.026 | | | | |
| | | | ≤ 0.079 | 0.008 – **0.012** – 0.022 | | | | |
| | | | ≤ 0.098 | 0.008 – **0.010** – 0.014 | | | | |
| | | (40 ~ 50HRC) | ≤ 0.020 | 0.004 – **0.012** – 0.020 | – | ★ 200 – **330** – 430 (Dry Machining Recommended) | – | – |
| | | | ≤ 0.039 | 0.004 – **0.010** – 0.016 | | | | |
| | | | ≤ 0.059 | 0.004 – **0.008** – 0.012 | | | | |
| | | | ≤ 0.079 | – | | | | |
| | | | ≤ 0.098 | | | | | |
| | | (50 ~ 55HRC) | ≤ 0.020 | 0.004 – **0.008** – 0.016 | – | ★ 160 – **230** – 330 (Dry Machining Recommended) | – | – |
| | | | ≤ 0.039 | 0.004 – **0.006** – 0.010 | | | | |
| | | | ≤ 0.059 | – | | | | |
| | | | ≤ 0.079 | | | | | |
| | | | ≤ 0.098 | | | | | |
| | Austenitic Stainless Steel | | ≤ 0.020 | 0.008 – **0.024** – 0.039 | ★ 330 – **460** – 590 | ☆ 330 – **460** – 590 | – | – |
| | | | ≤ 0.039 | 0.008 – **0.020** – 0.035 | | | | |
| | | | ≤ 0.059 | 0.008 – **0.018** – 0.024 | | | | |
| | | | ≤ 0.079 | 0.008 – **0.012** – 0.020 | | | | |
| | | | ≤ 0.098 | 0.008 – **0.010** – 0.016 | | | | |
| | Martensitic StainlessSteel | | ≤ 0.020 | 0.008 – **0.024** – 0.039 | ☆ 330 – **490** – 660 | – | – | ★ 490 – **660** – 980 |
| | | | ≤ 0.039 | 0.008 – **0.020** – 0.035 | | | | |
| | | | ≤ 0.059 | 0.008 – **0.018** – 0.024 | | | | |
| | | | ≤ 0.079 | 0.008 – **0.012** – 0.020 | | | | |
| | | | ≤ 0.098 | 0.008 – **0.010** – 0.016 | | | | |
| | Precipitation Hardened Stainless Steel | | ≤ 0.020 | 0.004 – **0.012** – 0.020 | ★ 300 – **390** – 490 | – | – | – |
| | | | ≤ 0.039 | 0.004 – **0.010** – 0.018 | | | | |
| | | | ≤ 0.059 | 0.004 – **0.006** – 0.010 | | | | |
| | | | ≤ 0.079 | – | | | | |
| | | | ≤ 0.098 | | | | | |
| | Gray Cast Iron | | ≤ 0.020 | 0.008 – **0.032** – 0.051 | – | – | ★ 390 – **520** – 720 | – |
| | | | ≤ 0.039 | 0.008 – **0.028** – 0.043 | | | | |
| | | | ≤ 0.059 | 0.008 – **0.024** – 0.032 | | | | |
| | | | ≤ 0.079 | 0.008 – **0.016** – 0.028 | | | | |
| | | | ≤ 0.098 | 0.008 – **0.012** – 0.020 | | | | |
| | Nodular Cast Iron | | ≤ 0.020 | 0.008 – **0.024** – 0.039 | – | – | ★ 330 – **490** – 660 | – |
| | | | ≤ 0.039 | 0.008 – **0.020** – 0.035 | | | | |
| | | | ≤ 0.059 | 0.008 – **0.016** – 0.028 | | | | |
| | | | ≤ 0.079 | 0.008 – **0.012** – 0.024 | | | | |
| | | | ≤ 0.098 | 0.008 – **0.010** – 0.016 | | | | |
| | Ni-base Heat-Resistant Alloy | | ≤ 0.020 | 0.004 – **0.012** – 0.018 | ☆ 70 – **100** – 160 | – | – | ★ 70 – **100** – 160 |
| | | | ≤ 0.039 | 0.004 – **0.010** – 0.016 | | | | |
| | | | ≤ 0.059 | 0.004 – **0.006** – 0.008 | | | | |
| | | | ≤ 0.079 | – | | | | |
| | | | ≤ 0.098 | | | | | |
| | Titanium Alloy | | ≤ 0.020 | 0.004 – **0.012** – 0.020 | ★ 130 – **200** – 260 | – | – | – |
| | | | ≤ 0.039 | 0.004 – **0.010** – 0.018 | | | | |
| | | | ≤ 0.059 | 0.004 – **0.006** – 0.010 | | | | |
| | | | ≤ 0.079 | – | | | | |
| | | | ≤ 0.098 | | | | | |

- 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.
- 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 CAT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions. Slotting is not recommended in this situation.
- Center through air 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.

# MFH-RAPTOR

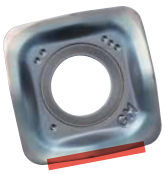
(Cutter Dia. Ø1.000" ~ Ø6.000")
(Cutter Dia. Ø25mm ~ Ø160mm)

## Wide Product Lineup for High Feed Milling Applications

Large Depths of Cut and Low Cutting Forces

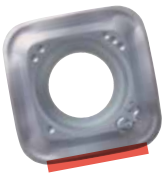
## 1 4 Different Insert Designs Offer a Variety of Machining Options

### GM (General Milling)



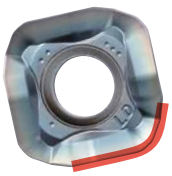
**1st Choice for General Purpose**
Multiple Metalworking Processes

### NEW GH (Tough Edge)



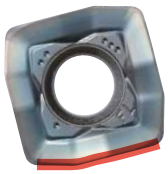
**Tough Edge**
Excellent Fracture Resistance

### LD (Large D.O.C.)



**1st Choice for Large D.O.C.**
Available for Scale Removal

### FL (Wiper Edge)



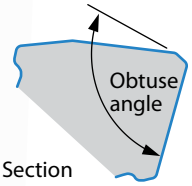
**Wiper Edge**
Roughing and Finishing Even in Low Horsepower Machining Centers

### GH Chipbreaker

Excellent Fracture Resistance

**Convex Cutting Edge Design**

Reduces cutting force when entering workpiece
Surpresses chattering and fracturing


A - A' Section

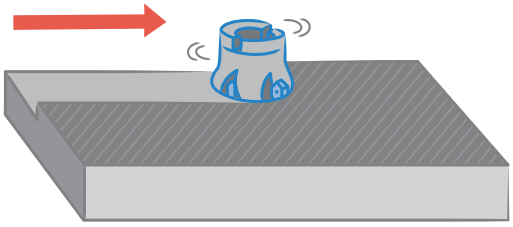
**Tough Edge Design**

Combining with PR015S is excellent for machining hardened material with improved fracture resistance

## *LD Chipbreaker Can Be Used for Both Large D.O.C. and High Feed Machining*

Large D.O.C. for Scale Removal

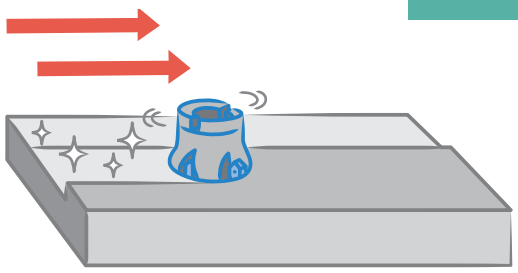
**D.O.C. = 0.158"**



(fz = 0.010 ipt, D.O.C. = 0.158")

High Feed Rates After Scale Removal

**fz = 0.059 ipt**



(fz = 0.059 ipt, D.O.C. = 0.079")

### MFH2500R-14-5T (Cutter Dia. 2.500", 5 Inserts)

① **Roughing for Scale Removal (2 Passes): Large D.O.C.**

Vc = 660 sfm, fz = 0.010 ipt
D.O.C. × ae = 0.158" × 1.575"
Vf = 50 in/min

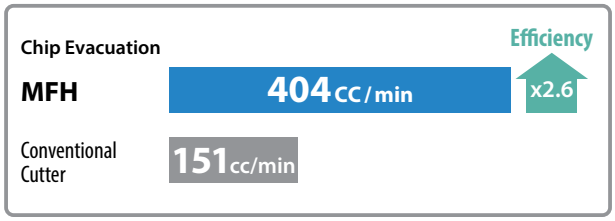
② **Roughing (2 Passes) After Scale Removal: High Feed Rate**

Vc = 660 sfm, fz = 0.059 ipt
D.O.C. × ae = 0.079" × 1.575", Vf = 298 in/min
Workpiece: Stainless Steel

### Conventional 45° Cutter (Cutter Dia. 2.500", 5 Inserts)

**Roughing (4 Passes): Constant D.O.C. and Feed Rate**

Vc = 660 sfm, fz = 0.010 ipt
D.O.C. × ae = 0.118" × 1.575", Vf = 50 in/min
Workpiece: Structural Steel



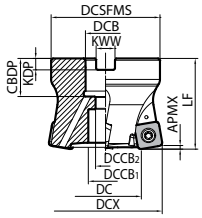


Fig.1

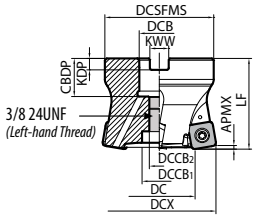


Fig.2

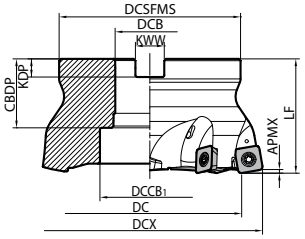


Fig.3

## Toolholder Dimensions with SOMT10 Inserts (Inch Size)

| Part Number | Stock | No. of Inserts | Dimensions (in) | | | | | | | | | | | | | | Rake Angle (°) | | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DCX | DC | | | DCSFMS | DCB | $DCCB_1$ | $DCCB_2$ | LF | CBDP | KDP | KWW | APMX | $*^1APMX_2$ | A.R. | R.R. | | | | |
| | | | | GM/GH | LD | FL | | | | | | | | | | | | | | | | |
| **MFH 2000R-10-4T** | ● | 4 | 2.000 | 1.331 | 1.510 | 1.469 | 1.750 | 0.750 | 0.669 | 0.433 | 1.969 | 0.947 | 0.187 | 0.313 | 0.059 $*^2$(0.138) | 0.047 | +10° | -5° | | Fig.1 | 0.4 | 10,000 |
| **2000R-10-5T** | ● | 5 | 2.000 | 1.331 | 1.510 | 1.469 | 1.750 | 0.750 | 0.669 | 0.433 | 1.969 | 0.947 | 0.187 | 0.313 | | | +10° | -5° | | | 0.4 | 10,000 |
| **MFH 2500R-10-5T** | ● | 5 | 2.500 | 1.831 | 2.010 | 1.969 | 2.250 | 0.750 | 0.669 | 0.433 | 1.969 | 0.75 | 0.187 | 0.313 | | | +10° | -4° | ✓ | | 0.7 | 8,800 |
| **2500R-10-6T** | ● | 6 | 2.500 | 1.831 | 2.010 | 1.969 | 2.250 | 0.750 | 0.669 | 0.433 | 1.969 | 0.75 | 0.187 | 0.313 | | | +10° | -4° | | | 0.7 | 8,800 |
| **MFH 3000R-10-7T** | ● | 7 | 3.000 | 2.331 | 2.510 | 2.469 | 2.750 | 1.000 | 0.866 | 0.551 | 2.48 | 1.063 | 0.236 | 0.382 | | | +10° | -4° | | | 1.3 | 7,600 |

## Toolholder Dimensions with SOMT14 Inserts (Inch Size)

| Part Number | Stock | No. of Inserts | Dimensions (in) | | | | | | | | | | | | | | Rake Angle (°) | | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DCX | DC | | | DCSFMS | DCB | $DCCB_1$ | $DCCB_2$ | LF | CBDP | KDP | KWW | APMX | $*^1APMX_2$ | A.R. | R.R. | | | | |
| | | | | GM/GH | LD | FL | | | | | | | | | | | | | | | | |
| **MFH 2000R-14-4T** | ● | 4 | 2.000 | 1.094 | 1.330 | 1.291 | 1.750 | 0.750 | 0.500 | 3/8 24UNF | 1.969 | 0.827 | 0.187 | 0.313 | 0.079 $*^2$(0.197) | 0.079 | +10° | -10° | ✓ | Fig.2 | 0.4 | 8,800 |
| **2000R-14-5T** | ● | 5 | 2.000 | 1.094 | 1.330 | 1.291 | 1.750 | 0.750 | 0.500 | | 1.969 | 0.827 | 0.187 | 0.313 | | | +10° | -10° | | | 0.4 | 8,800 |
| **MFH 2500R-14-4T** | ● | 4 | 2.500 | 1.594 | 1.830 | 1.791 | 2.250 | 0.750 | 0.669 | 0.433 | 1.969 | 0.750 | 0.187 | 0.313 | | | +10° | -10° | | Fig.1 | 0.6 | 7,400 |
| **2500R-14-5T** | ● | 5 | 2.500 | 1.594 | 1.830 | 1.791 | 2.250 | 0.750 | 0.669 | 0.433 | 1.969 | 0.750 | 0.187 | 0.313 | | | +10° | -10° | | | 0.6 | 7,400 |
| **2500R-14-5T-1000** | ● | 5 | 2.500 | 1.594 | 1.830 | 1.791 | 2.251 | 1.000 | 0.866 | 0.551 | 2.480 | 1.063 | 0.236 | 0.382 | | | +10° | -10° | | | 0.7 | 7,400 |
| **MFH 3000R-14-5T** | ● | 5 | 3.000 | 2.094 | 2.330 | 2.291 | 2.750 | 1.000 | 0.866 | 0.551 | 2.480 | 1.063 | 0.236 | 0.382 | | | +10° | -9° | ✓ | | 1.2 | 6,400 |
| **3000R-14-6T** | ● | 6 | 3.000 | 2.094 | 2.330 | 2.291 | 2.750 | 1.000 | 0.866 | 0.551 | 2.480 | 1.063 | 0.236 | 0.382 | | | +10° | -9° | | | 1.2 | 6,400 |
| **3000R-14-6T-1250** | ● | 6 | 3.000 | 2.094 | 2.330 | 2.291 | 2.750 | 1.250 | 1.000 | 0.657 | 2.480 | 1.063 | 0.280 | 0.504 | | | +10° | -9° | | | 1.3 | 6,400 |
| **MFH 4000R-14-6T** | ● | 6 | 4.000 | 3.094 | 3.330 | 3.291 | 3.750 | 1.500 | 1.299 | 0.866 | 2.480 | 1.181 | 0.394 | 0.626 | | | +10° | -7° | | | 2.3 | 5,600 |
| **4000R-14-7T** | ● | 7 | 4.000 | 3.094 | 3.330 | 3.291 | 3.750 | 1.500 | 1.299 | 0.866 | 2.480 | 1.181 | 0.394 | 0.626 | | | +10° | -7° | | | 2.3 | 5,600 |
| **MFH 5000R-14-7T** | ● | 7 | 5.000 | 4.094 | 4.330 | 4.291 | 3.750 | 1.500 | 2.047 | - | 2.480 | 1.496 | 0.394 | 0.626 | | | +10° | -7° | ✓ | Fig.3 | 2.9 | 4,800 |
| **MFH 6000R-14-8T** | ● | 8 | 6.000 | 5.094 | 5.330 | 5.291 | 4.880 | 2.000 | 2.835 | - | 2.480 | 1.496 | 0.433 | 0.752 | | | +10° | -6° | × | | 4.5 | 4,200 |

● : Standard Item

*1 Refer to LD cutting edge dimensions in figure below

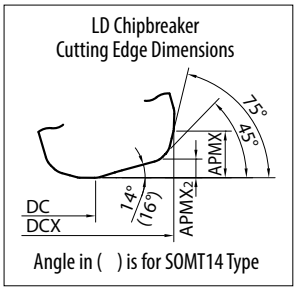
*2 Dimension in ( ) is when mounting LD

## Spare Parts and Applicable Inserts (Inch Size)

| Part Number | Spare Parts | | | | | Applicable Inserts P20 |
|---|---|---|---|---|---|---|
| | Insert Screw | Wrench | | Anti-Seize Compound | Mounting Bolt | |
| | | DTPM | TTP | | | |
| **MFH2000R-10-4T** | SB-4090TRPN | DTPM-15 Recommended Torque for Insert Clamp 3.5 N·m | | P-37 | HH3/8-1.25(H) | SOMT100420ER-GM<br>SOMT100420ER-GH<br>SOMT100420ER-LD<br>SOMT100420ER-FL |
| **MFH2000R-10-5T** | | | | | | |
| **MFH2500R-10-5T** | | | | | | |
| **MFH2500R-10-6T** | | | | | | |
| **MFH3000R-10-7T** | | | | | HH1/2-1.25(H) | |
| **MFH2000R-14-4T** | SB-50120TRP | TTP-20 Recommended Torque for Insert Clamp 4.5 N·m | | P-37 | XNS610*2 | SOMT140520ER-GM<br>SOMT140520ER-GH<br>SOMT140520ER-LD<br>SOMT140514ER-FL |
| **MFH2000R-14-5T** | SB-5090TRP | | | | | |
| **MFH2500R-14-4T** | SB-50120TRP | | | | HH3/8-1.25(H) | |
| **MFH2500R-14-5T** | | | | | | |
| **MFH2500R-14-5T-1000** | | | | | HH1/2-1.25(H) | |
| **MFH3000R-14-5T** | | | | | | |
| **MFH3000R-14-6T** | | | | | | |
| **MFH3000R-14-6T-1250** | | | | | HH5/8-1.50(H) | |
| **MFH4000R-14-6T** | | | | | HH3/4-2.3(H) | |
| **MFH4000R-14-7T** | | | | | | |
| **MFH5000R-14-7T** | | | | | - | |
| **MFH6000R-14-8T** | | | | | | |

(H) Optional coolant thru bolt available.

Recommended Cutting Conditions P21-22




**Caution with Max. Revolution**

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

*3 Differential screw (3/8-24UNF)

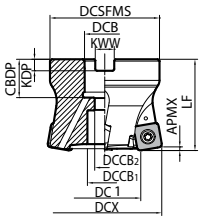


Fig.1

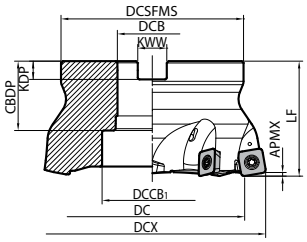


Fig.2

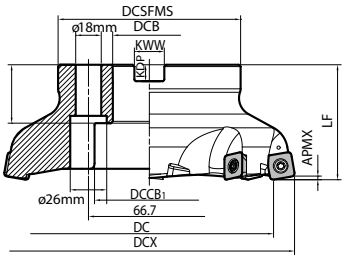


Fig.3

## Toolholder Dimensions with SOMT10 Inserts (Metric Size)

| Bore Dia. | Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | | | | | | | | | | Rake Angle (°) | | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | | | DCSFMS | DCB | $DCCB_1$ | $DCCB_2$ | LF | CBDP | KDP | KWW | APMX | $*^1APMX_2$ | A.R. | R.R. | | | | |
| | | | | | GM/GH | LD | FL | | | | | | | | | | | | | | | | |
| Inch Spec | MFH 050R-10-4T | ● | 4 | 50 | 33 | 37.5 | 36.5 | 47 | 0.875" | 19 | 11 | 50 | 0.748" | 0.197" | 0.331" | 1.5 $*^2$(3.5) | 1.2 | +10° | -5° | | Fig.1 | 0.4 | 10,000 |
| | 050R-10-5T | ● | 5 | 50 | 33 | 37.5 | 36.5 | 47 | 0.875" | 19 | 11 | 50 | 0.748" | 0.197" | 0.331" | | | +10° | -5° | | | 0.4 | 10,000 |
| | MFH 063R-10-5T | ● | 5 | 63 | 46 | 50.5 | 49.5 | 60 | 0.875" | 19 | 11 | 50 | 0.748" | 0.197" | 0.331" | | | +10° | -4° | ✓ | | 0.7 | 8,800 |
| | 063R-10-6T | ● | 6 | 63 | 46 | 50.5 | 49.5 | 60 | 0.875" | 19 | 11 | 50 | 0.748" | 0.197" | 0.331" | | | +10° | -4° | | | 0.7 | 8,800 |
| | MFH 080R-10-7T | ● | 7 | 80 | 63 | 67.5 | 66.5 | 76 | 1.250" | 26 | 17 | 63 | 1.260" | 0.315" | 0.500" | | | +10° | -4° | | | 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 $*^2$(3.5) | 1.2 | +10° | -5° | | Fig.1 | 0.4 | 10,000 |
| | 050R-10-5T-M | ● | 5 | 50 | 33 | 37.5 | 36.5 | 47 | 22 | 19 | 11 | 50 | 21 | 6.3 | 10.4 | | | +10° | -5° | | | 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 | | | +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 | | | +10° | -4° | ✓ | | 0.7 | 8,800 |
| | 063R-10-5T-27M | ● | 5 | 63 | 46 | 50.5 | 49.5 | 60 | 27 | 20 | 13 | 50 | 24 | 7 | 12.4 | | | +10° | -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 | | | +10° | -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 | | | +10° | -4° | | | 1.6 | 7,600 |

## Toolholder Dimensions with SOMT14 Inserts (Metric Size)

| Bore Dia. | Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | | | | | | | | | | Rake Angle (°) | | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | | | DCSFMS | DCB | $DCCB_1$ | $DCCB_2$ | LF | CBDP | KDP | KWW | APMX | $*^1APMX_2$ | A.R. | R.R. | | | | |
| | | | | | GM/GH | LD | FL | | | | | | | | | | | | | | | | |
| Inch Spec | MFH 050R-14-4T | ● | 4 | 50 | 27 | 33 | 32 | 47 | 0.875" | 12 | - | 50 | 0.748" | 0.197" | 0.331" | 2 $*^2$(5) | 2 | +10° | -10° | | Fig.1 | 0.4 | 8,800 |
| | MFH 063R-14-4T | ● | 4 | 63 | 40 | 46 | 45 | 60 | 0.875" | 19 | 11 | 50 | 0.748" | 0.197" | 0.331" | | | | -10° | | Fig.1 | 0.6 | 7,400 |
| | 063R-14-5T | ● | 5 | 63 | 40 | 46 | 45 | 60 | 0.875" | 19 | 11 | 50 | 0.748" | 0.197" | 0.331" | | | | -10° | | Fig.1 | 0.6 | 7,400 |
| | MFH 080R-14-5T | ● | 5 | 80 | 57 | 63 | 62 | 76 | 1.250" | 26 | 17 | 63 | 1.260" | 0.315" | 0.500" | | | | -8° | ✓ | Fig.1 | 1.3 | 6,400 |
| | 080R-14-6T | ● | 6 | 80 | 57 | 63 | 62 | 76 | 1.250" | 26 | 17 | 63 | 1.260" | 0.315" | 0.500" | | | | -8° | | Fig.1 | 1.3 | 6,400 |
| | MFH 100R-14-6T | ● | 6 | 100 | 77 | 83 | 82 | 96 | 1.250" | 26 | 17 | 63 | 1.260" | 0.315" | 0.500" | | | | -7° | | Fig.1 | 2.4 | 5,600 |
| | 100R-14-7T | ● | 7 | 100 | 77 | 83 | 82 | 96 | 1.250" | 26 | 17 | 63 | 1.260" | 0.315" | 0.500" | | | | -7° | | Fig.1 | 2.4 | 5,600 |
| | MFH 125R-14-7T | ● | 7 | 125 | 102 | 108 | 107 | 100 | 1.500" | 55 | - | 63 | 1.496" | 0.394" | 0.625" | | | | -7° | | Fig.2 | 2.9 | 4,800 |
| | MFH 160R-14-8T | ● | 8 | 160 | 137 | 143 | 142 | 100 | 2.000" | 72 | - | 63 | 1.496" | 0.433" | 0.750" | | | | -6° | × | Fig.2 | 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 $*^2$(5) | 2 | +10° | -10° | | 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 | | | | -10° | | Fig.1 | 0.6 | 7,400 |
| | 063R-14-5T-22M | ● | 5 | 63 | 40 | 46 | 45 | 60 | 22 | 19 | 11 | 50 | 21 | 6.3 | 10.4 | | | | -10° | | Fig.1 | 0.6 | 7,400 |
| | 063R-14-4T-27M | ● | 4 | 63 | 40 | 46 | 45 | 60 | 27 | 20 | 13 | 50 | 24 | 7 | 12.4 | | | | -10° | | Fig.1 | 0.6 | 7,400 |
| | 063R-14-5T-27M | ● | 5 | 63 | 40 | 46 | 45 | 60 | 27 | 20 | 13 | 50 | 24 | 7 | 12.4 | | | | -10° | | Fig.1 | 0.6 | 7,400 |
| | MFH 080R-14-5T-M | ● | 5 | 80 | 57 | 63 | 62 | 76 | 27 | 20 | 13 | 63 | 24 | 7 | 12.4 | | | | -8° | ✓ | Fig.1 | 1.4 | 6,400 |
| | 080R-14-6T-M | ● | 6 | 80 | 57 | 63 | 62 | 76 | 27 | 20 | 13 | 63 | 24 | 7 | 12.4 | | | | -8° | | Fig.1 | 1.4 | 6,400 |
| | MFH 100R-14-6T-M | ● | 6 | 100 | 77 | 83 | 82 | 96 | 32 | 26 | 17 | 63 | 28 | 8 | 14.4 | | | | -7° | | Fig.2 | 2.4 | 5,600 |
| | 100R-14-7T-M | ● | 7 | 100 | 77 | 83 | 82 | 96 | 32 | 26 | 17 | 63 | 28 | 8 | 14.4 | | | | -7° | | Fig.2 | 2.4 | 5,600 |
| | MFH 125R-14-7T-M | ● | 7 | 125 | 102 | 108 | 107 | 100 | 40 | 55 | - | 63 | 33 | 9 | 16.4 | | | | -7° | | Fig.2 | 2.8 | 4,800 |
| | MFH 160R-14-8T-M | ● | 8 | 160 | 137 | 143 | 142 | 100 | 40 | 68 | 66.7 | 63 | 32 | 9 | 16.4 | | | | -6° | × | Fig.3 | 3.7 | 4,200 |

Spare Parts and Applicable Inserts ➔ **P15**
Recommended Cutting Conditions ➔ **P21-22**

● : Standard Item

$*^1$ Refer to LD cutting edge dimensions on page 16 $*^2$ Dimension in ( ) is when mounting LD

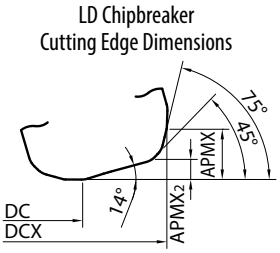
## Spare Parts and Applicable Inserts (Metric Size)

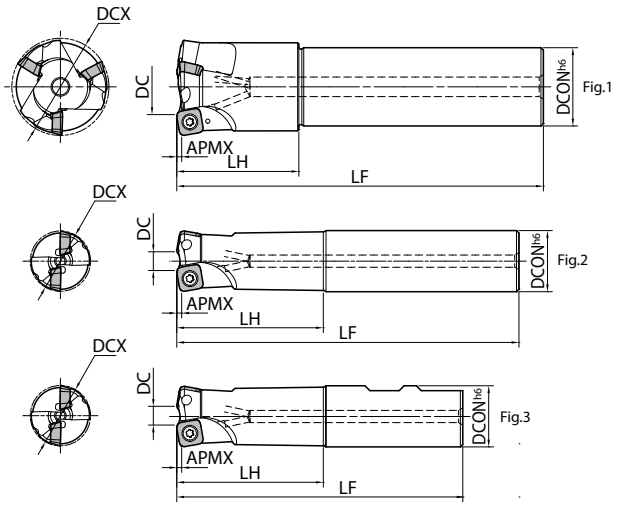
| Part Number | Spare Parts | | | | | Applicable Inserts P20 |
|---|---|---|---|---|---|---|
| | Insert Screw | Wrench | | Anti-Seize Compound | Mounting Bolt | |
| |  | DTPM  | TTP  |  |  | |
| **MFH050R-10-…(-M)** | SB-4090TRPN | DTPM-15 Recommended Torque for Insert Clamp 3.5 N·m | | P-37 | HH10×30 | SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL |
| **MFH063R-10-…(-22M)** | | | | | HH10×30 | |
| **MFH063R-10-…-27M** | | | | | HH12×35 | |
| **MFH080R-10-…** | | | | | HH16×40 | |
| **MFH080R-10-…-M** | | | | | HH12×35 | |
| **MFH050R-14-…(-M)** | SB-50120TRP | TTP-20 Recommended Torque for Insert Clamp 4.5 N·m | | P-37 | W10×31 | SOMT140520ER-GM SOMT140520ER-GH SOMT140520ER-LD SOMT140514ER-FL |
| **MFH063R-14-…(-22M)** | | | | | HH10×30 | |
| **MFH063R-14-…-27M** | | | | | HH12×35 | |
| **MFH080R-14-…** | | | | | HH16×40 | |
| **MFH080R-14-…-M** | | | | | HH12×35 | |
| **MFH100R-14-…** | | | | | HH16×40 | |
| **MFH100R-14-…-M** | | | | | - | |
| **MFH125R-14-…** | | | | | - | |
| **MFH160R-14-…** | | | | | - | |

**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

Standard (Cylindrical)




## Toolholder Dimensions with SOMT10 Inserts (Inch Size)

| Shank | Part Number | Stock | No. of Inserts | Dimensions (in) | | | | | | | | | Rake Angle (°) | | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | | | DCON | LF | LH | APMX | $APMX_2$ | A.R. | R.R. | | | | |
| | | | | | GM/GH | LD | FL | | | | | | | | | | | |
| Standard Shank (Weldon) | MFH 1000-W100-10-2T | ● | 2 | 1.000 | 0.331 | 0.508 | 0.469 | 1.000 | 5.500 | 3.173 | 0.059 *(0.138) | 0.047 | +10° | -5° | ✓ | Fig.3 | 0.4 | 17,000 |
| | MFH 1250-W125-10-2T | ● | 2 | 1.250 | 0.581 | 0.758 | 0.719 | 1.250 | 6.000 | 2.750 | | | | | | Fig.3 | 0.8 | 14,000 |
| | 1250-W125-10-3T | ● | 3 | 1.250 | 0.581 | 0.758 | 0.719 | 1.250 | 6.000 | 2.750 | | | | | | Fig.3 | 0.8 | 14,000 |
| | MFH 1500-W150-10-3T | ● | 3 | 1.500 | 0.831 | 1.008 | 0.969 | 1.500 | 6.000 | 2.000 | | | | | | Fig.3 | 0.8 | 11,500 |
| | 1500-W150-10-4T | ● | 4 | 1.500 | 0.831 | 1.008 | 0.969 | 1.500 | 6.000 | 2.000 | | | | | | Fig.3 | 0.8 | 11,500 |
| Long Shank (Cylindrical) | MFH 1000-S100-10-2T-8 | ● | 2 | 1.000 | 0.331 | 0.508 | 0.469 | 1.000 | 8.000 | 4.750 | | | | | | Fig.2 | 0.8 | 17,000 |
| | MFH 1250-S125-10-2T-8 | ● | 2 | 1.250 | 0.581 | 0.758 | 0.719 | 1.250 | 8.000 | 4.750 | | | | | | Fig.2 | 0.8 | 14,000 |
| | MFH 1500-S125-10-4T10 | ● | 4 | 1.500 | 0.831 | 1.008 | 0.969 | 1.250 | 10.000 | 2.000 | | | | | | Fig.1 | 0.8 | 11,500 |

● : Standard Item
*Dimension in ( ) is when mounting LD

## Spare Parts and Applicable Inserts (Inch Size)

| Part Number | Spare Parts | | | Applicable Inserts ➔ P20 |
|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | |
| |  |  |  | |
| MFH...-10-... | SB-4075TRP | DTPM-15<br>Recommended Torque for Insert Clamp 3.5 N-m | P-37 | SOMT100420ER-GM<br>SOMT100420ER-GH<br>SOMT100420ER-LD<br>SOMT100420ER-FL |

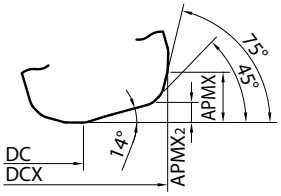
**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

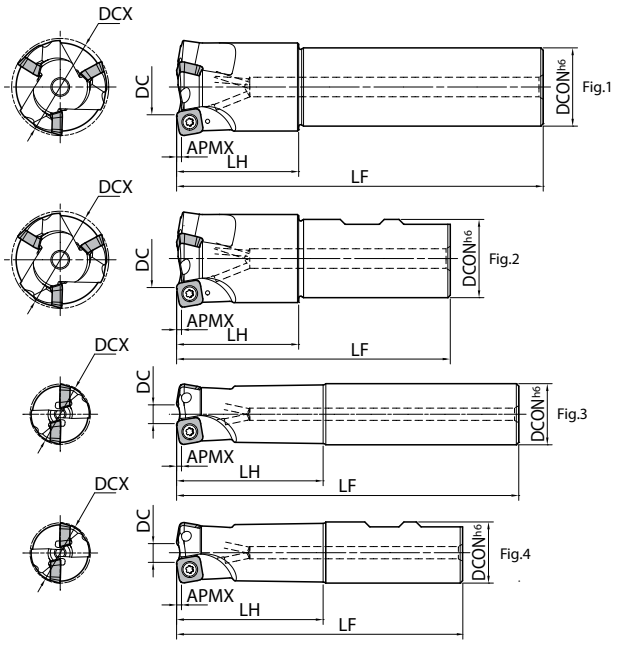
**Coat Anti-Seize Compound (P-37)** thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions ➔ P21-22

Standard (Cylindrical)

LD Chipbreaker
Cutting Edge Dimensions




## Toolholder Dimensions with SOMT10 Inserts (Metric Size)

| Shank | Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | | | | | Rake Angle (°) | | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | | | DCON | LF | LH | APMX | $APMX_2$ | A.R. | R.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° | -5° | ✓ | Fig.3 | 0.4 | 17,000 |
| | MFH 28-S25-10-2T | ● | 2 | 28 | 11 | 15.5 | 14.5 | 25 | 140 | 40 | | | | | | Fig.1 | 0.5 | 15,500 |
| | MFH 32-S32-10-2T | ● | 2 | 32 | 15 | 19.5 | 18.5 | 32 | 150 | 70 | | | | | | Fig.3 | 0.8 | 14,000 |
| | 32-S32-10-3T | ● | 3 | 32 | 15 | 19.5 | 18.5 | 32 | 150 | 70 | | | | | | Fig.3 | 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 | | | | | | Fig.1 | 0.8 | 13,000 |
| | MFH 40-S32-10-3T | ● | 3 | 40 | 23 | 27.5 | 26.5 | 32 | 150 | 50 | | | | | | Fig.1 | 0.9 | 11,500 |
| | 40-S32-10-4T | ● | 4 | 40 | 23 | 27.5 | 26.5 | 32 | 150 | 50 | | | | | | Fig.1 | 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° | -5° | ✓ | Fig.4 | 0.4 | 17,000 |
| | MFH 32-W32-10-3T | ● | 3 | 32 | 15 | 19.5 | 18.5 | 32 | 131 | 70 | | | | | | Fig.4 | 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 | | | | | | Fig.2 | 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° | -5° | ✓ | 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 | | | | | | Fig.1 | 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° | -5° | ✓ | 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 | | | | | | Fig.1 | 1.8 | 11,500 |

● : Standard Item
*Dimension in ( ) is when mounting LD

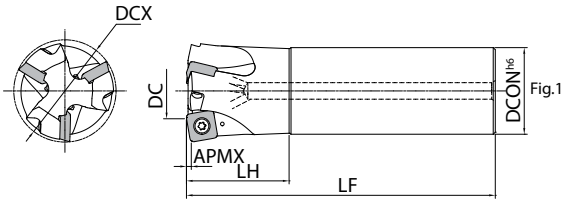
## Spare Parts and Applicable Inserts (Metric Size)

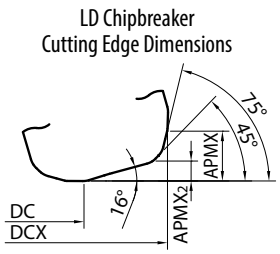
| Part Number | Spare Parts | | | Applicable Inserts ➡ P20 |
|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | |
| |  |  |  | |
| MFH...-10-... | SB-4075TRP | DTPM-15<br>Recommended Torque for Insert Clamp 3.5 N·m | P-37 | SOMT100420ER-GM<br>SOMT100420ER-GH<br>SOMT100420ER-LD<br>SOMT100420ER-FL |

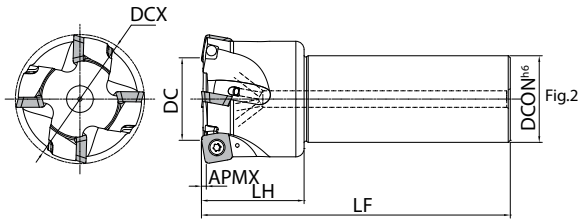
**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

Recommended Cutting Conditions ➡ P21-22




## Toolholder Dimensions with SOMT14 Inserts (Metric Size)

| Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | | | | | Rake Angle (°) | | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DCX | DC | | | DCON | LF | LH | APMX | APMX2 | A.R. | R.R. | | | | |
| | | | | GM/GH | LD | FL | | | | | | | | | | | |
| **MFH 50-S42-14-3T** | ● | 3 | 50 | 27 | 33 | 32 | 42 | 150 | 50 | 2 *(5) | 2 | +10° | -10° | ✓ | Fig.1 | 1.4 | 8,800 |
| **MFH 63-S42-14-4T** | ● | 4 | 63 | 40 | 46 | 45 | 42 | 150 | 50 | | | | -10° | ✓ | Fig.2 | 1.7 | 7,400 |
| **MFH 80-S42-14-5T** | ● | 5 | 80 | 57 | 63 | 62 | 42 | 150 | 50 | | | | -8° | ✓ | Fig.2 | 2.3 | 6,400 |

● : Standard Item
*Dimension in ( ) is when mounting LD

## Spare Parts and Applicable Inserts (Metric Size)

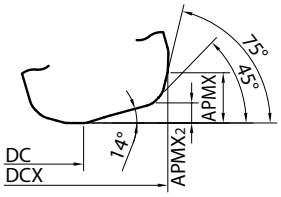
| Part Number | Spare Parts | | | Applicable Inserts |
|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | P20 |
| |  |  |  | |
| **MFH…-14-…** | SB-50120TRP | TTP-20<br>Recommended Torque for Insert Clamp 4.5 N·m | P-37 | SOMT140520ER-GM<br>SOMT140520ER-GH<br>SOMT140520ER-LD<br>SOMT140514ER-FL |

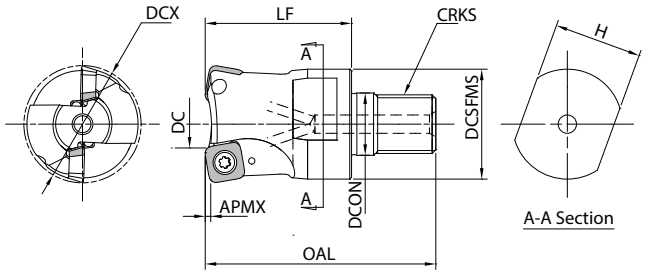
**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

Recommended Cutting Conditions P21-22

LD Chipbreaker
Cutting Edge Dimensions




## Toolholder Dimensions

| Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | | | | | | | | Rake Angle (°) | | Coolant Hole | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DCX | DC | | | DCSFMS | DCON | OAL | LF | CRKS | H | APMX | $APMX_2$ | A.R. | R.R. | | |
| | | | | GM/GH | LD | FL | | | | | | | | | | | | |
| **MFH 25-M12-10-2T** | ● | 2 | 25 | 8 | 12.5 | 11.5 | 23 | 12.5 | 57 | 35 | M12×P1.75 | 19 | 1.5 *(3.5) | 1.2 | +10° | -5° | ✓ | 17,000 |
| **MFH 28-M12-10-2T** | ● | 2 | 28 | 11 | 15.5 | 14.5 | 23 | 12.5 | 57 | 35 | M12×P1.75 | 19 | | | | | | 15,500 |
| **MFH 32-M16-10-2T** | ● | 2 | 32 | 15 | 19.5 | 18.5 | 30 | 17 | 63 | 40 | M16×P2.0 | 24 | | | | | | 14,000 |
| **32-M16-10-3T** | ● | 3 | 32 | 15 | 19.5 | 18.5 | 30 | 17 | 63 | 40 | M16×P2.0 | 24 | | | | | | 14,000 |
| **MFH 35-M16-10-2T** | ● | 2 | 35 | 18 | 22.5 | 21.5 | 30 | 17 | 63 | 40 | M16×P2.0 | 24 | | | | | | 13,000 |
| **35-M16-10-3T** | ● | 3 | 35 | 18 | 22.5 | 21.5 | 30 | 17 | 63 | 40 | M16×P2.0 | 24 | | | | | | 13,000 |
| **MFH 40-M16-10-3T** | ● | 3 | 40 | 23 | 27.5 | 26.5 | 30 | 17 | 63 | 40 | M16×P2.0 | 24 | | | | | | 11,500 |
| **40-M16-10-4T** | ● | 4 | 40 | 23 | 27.5 | 26.5 | 30 | 17 | 63 | 40 | M16×P2.0 | 24 | | | | | | 11,500 |

● : Standard Item
*Dimension in ( ) is when mounting LD

## Spare Parts and Applicable Inserts

| Part Number | Spare Parts | | | Applicable Inserts P20 |
|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | |
| |  |  |  | |
| **MFH…-10-…** | SB-4075TRP | DTPM-15<br>Recommended Torque for Insert Clamp 3.5 N·m | P-37 | SOMT100420ER-GM<br>SOMT100420ER-GH<br>SOMT100420ER-LD<br>SOMT100420ER-FL |

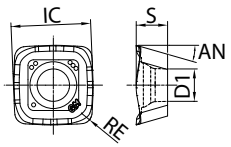
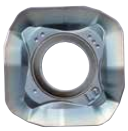
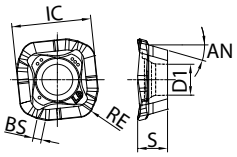
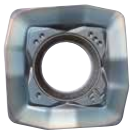
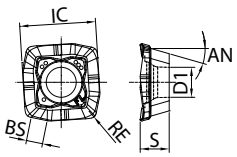
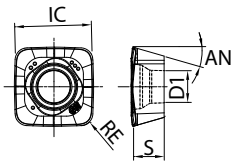
Recommended Cutting Conditions P21-22

**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

# MFH | Applicable Inserts

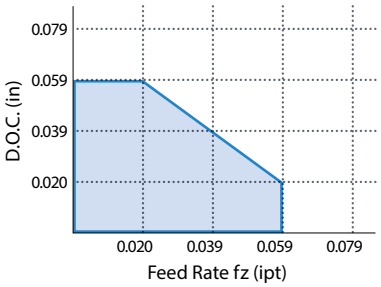
| Usage Classification | | | | | | | | Toolholder Reference Page |
|---|---|---|---|---|---|---|---|---|
| ★ : Roughing / 1st Choice<br>☆ : Roughing / 2nd Choice<br>■ : Finishing / 1st Choice<br>□ : Finishing / 2nd Choice | P | Carbon Steel / Alloy Steel | ☆ | ★ | | | | |
| | | Mold Steel | ☆ | ★ | | | | |
| | M | Austenitic Stainless Steel | ★ | ☆ | | | | |
| | | Martensitic Stainless Steel | ☆ | | | | ★ | |
| | K | Gray Cast Iron | | | ★ | | | |
| | | Nodular Cast Iron | | | ★ | | | |
| | S | Ni-base Heat Resistant Alloy | ★ | | | | ☆ | |
| | | Titanium Alloy | ★ | | ☆ | | | |
| | H | Hardened Materials | | □ | | | | |

| Insert | Part Number | Dimension (in) | | | | | Angle (°) | MEGACOAT NANO | | | MEGACOAT HARD | CVD Coated Carbide | Toolholder Reference Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | IC | S | D1 | BS | RE | AN | PR1535 | PR1525 | PR1510 | PR015S | CA6535 | |
|  General Purpose   | SOMT 100420ER-GM | 0.406 | 0.180 | 0.181 | - | 0.079 | 16° | ● | ● | ● | - | ● | P13 ~ P19 |
| | SOMT 140520ER-GM | 0.557 | 0.219 | 0.228 | - | 0.079 | 16° | ● | ● | ● | - | ● | |
|  Large D.O.C.   | SOMT 100420ER-LD | 0.411 | 0.180 | 0.181 | 0.035 | 0.079 | 16° | ● | ● | ● | - | ● | |
| | SOMT 140520ER-LD | 0.581 | 0.219 | 0.228 | 0.063 | 0.079 | 16° | ● | ● | ● | - | ● | |
|  Wiper Edge   | SOMT 100420ER-FL | 0.411 | 0.180 | 0.181 | 0.055 | 0.079 | 16° | ● | ● | ● | - | ● | |
| | SOMT 140514ER-FL | 0.574 | 0.219 | 0.228 | 0.122 | 0.055 | 16° | ● | ● | ● | - | ● | |
| NEW  Tough Edge   | SOMT 100420ER-GH | 0.411 | 0.180 | 0.179 | - | 0.079 | 16° | ● | ● | ● | ● | - | |
| | SOMT 140520ER-GH | 0.558 | 0.219 | 0.228 | - | 0.079 | 16° | ● | ● | ● | ● | - | |

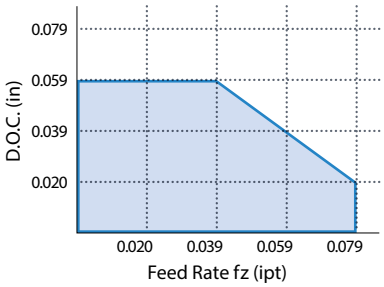
● : Standard Item

## Cutting Performance (GM / GH / FL Chipbreakers)

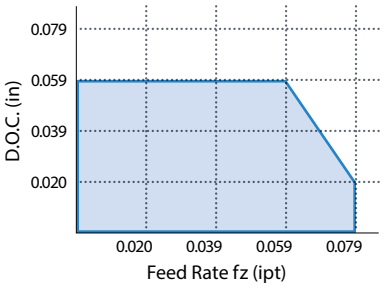
### MFH1000-W100-10-2T
### MFH25-S25-10-2T



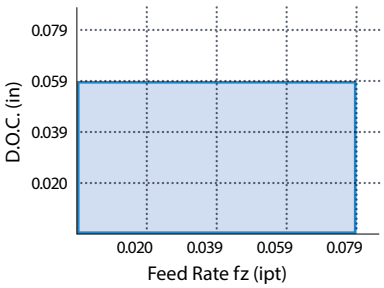

### MFH1250-W125-10-○T
### MFH32-S32-10-○T



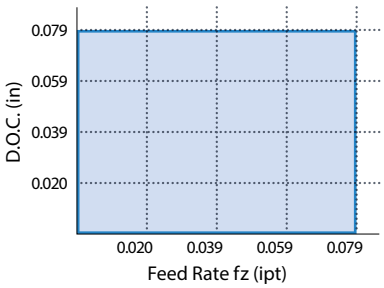

### MFH1500-W150-10-○T
### MFH40-S32-10-○T




### MFH2000R ~ 3000R-10-○T
### MFH050R ~ 080R-10-○T




### MFH · · -14-○T




**LD Chipbreaker:**
MAX D.O.C. for LD chipbreaker is 0.197" (0.138" for SOMT10)
Please refer to **P21-P22** for feed rate

**End Mill:**
Please refer to the application map above

**Face Mill:**
MAX feed rate (inches per tooth) fz = 0.079ipt

# MFH | Recommended Cutting Conditions

★ 1st Recommendation ☆ 2nd Recommendation

| Chipbreaker | Workpiece | Holder Part Number and Feed Rate (fz: ipt) | | | | | Recommended Insert Grade (Vc: sfm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | End Mill Feed Rates | | | Face Mill Feed Rates | | MEGACOAT NANO | | | MEGACOAT HARD | CVD Coated Carbide |
| | | MFH1000 MFH25- | MFH1250 MFH32- | MFH1500 MFH40- | MFH···R-10 | MFH···-14 | **PR1535** | **PR1525** | **PR1510** | **PR015S** | **CA6535** |
| GM GH | Carbon Steel | ① 0.020 - **0.032** - 0.039<br>② 0.008 - **0.016** - 0.020 | ① 0.020 - **0.039** - 0.059<br>② 0.012 - **0.028** - 0.039 | ① 0.020 - **0.047** - 0.071<br>② 0.016 - **0.039** - 0.059 | 0.020 - **0.059** - 0.079 | | ☆ 390 - **590** - 820 | ★ 390 - **590** - 820 | - | - | - |
| | Alloy Steel | ① 0.020 - **0.032** - 0.039<br>② 0.008 - **0.016** - 0.020 | ① 0.020 - **0.039** - 0.059<br>② 0.012 - **0.028** - 0.039 | ① 0.020 - **0.047** - 0.071<br>② 0.016 - **0.039** - 0.059 | 0.020 - **0.059** - 0.079 | | ☆ 330 - **520** - 720 | ★ 330 - **520** - 720 | - | - | - |
| | Mold Steel ~ 40HRc | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | ☆ 260 - **460** - 590 | ☆ 260 - **460** - 590 | - | **GH** ★ 260-**460**-590 | - |
| | Mold Steel 40~50HRc | ① 0.006 - **0.012** - 0.020<br>② 0.006 - **0.008** - 0.010 | ① 0.008 - **0.020** - 0.032<br>② 0.008 - **0.012** - 0.018 | ① 0.008 - **0.024** - 0.035<br>② 0.008 - **0.020** - 0.028 | 0.008 - **0.028** - 0.039 | | ☆ 200 - **330** - 430 | ☆ 200 - **330** - 430 | - | **GH** ★ 200-**330**-430 | - |
| | Mold Steel 50~55HRc | ① 0.006 - **0.010** - 0.016 | ① 0.006 - **0.014** - 0.024 | ① 0.006 - **0.010** - 0.028 | 0.008 - **0.020** - 0.031 | | - | ☆ 200 - **330** - 430 | - | **GH** ★ 160-**230**-330 | - |
| | Mold Steel 55~60HRc | ① 0.0004-**0.0024**-0.0039 (Recommended only with GH chipbreaker) | | | | | - | - | - | **GH** ★ 160-**200**-230 | - |
| | Austenitic Stainless Steel | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | **GM** ☆ 330 - **520** - 660 | **GM** ☆ 330 - **520** - 660 | - | - | - |
| | Martensitic Stainless Steel | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | ☆ 490 - **660** - 820 | - | - | - | ★ 590 - **790** - 980 |
| | Precipitation Hardened Stainless Steel | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | ★ 300 - **390** - 490 | - | - | - | - |
| | Gray Cast Iron | ① 0.020 - **0.032** - 0.039<br>② 0.008 - **0.016** - 0.020 | ① 0.020 - **0.039** - 0.059<br>② 0.012 - **0.028** - 0.039 | ① 0.020 - **0.047** - 0.071<br>② 0.016 - **0.039** - 0.059 | 0.020 - **0.059** - 0.079 | | - | - | ★ 390 - **590** - 820 | - | - |
| | Nodular Cast Iron | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | - | - | ★ 330 - **490** - 660 | - | - |
| | Ni-base Heat Resistant Alloy | ① 0.008 - **0.016** - 0.024<br>② 0.006 - **0.008** - 0.012 | ① 0.008 - **0.020** - 0.035<br>② 0.008 - **0.016** - 0.024 | ① 0.008 - **0.024** - 0.039<br>② 0.008 - **0.020** - 0.032 | 0.008 - **0.032** - 0.047 | | ☆ 70 - **100** - 160 | - | - | - | ★ 70 - **100** - 160 |
| | Titanium Alloy | ① 0.008 - **0.016** - 0.024<br>② 0.006 - **0.008** - 0.012 | ① 0.008 - **0.020** - 0.035<br>② 0.008 - **0.016** - 0.024 | ① 0.008 - **0.024** - 0.039<br>② 0.008 - **0.020** - 0.032 | 0.008 - **0.032** - 0.047 | | **GM** ★ 130 - **200** - 260 | - | **GM** ☆ 100 - **160** - 230 | - | - |
| LD | Carbon Steel | ① 0.020 - **0.032** - 0.039<br>③ 0.002 - **0.004** - 0.008 | ① 0.020 - **0.039** - 0.059<br>③ 0.002 - **0.006** - 0.012 | ① 0.020 - **0.047** - 0.071<br>③ 0.002 - **0.008** - 0.012 | ① 0.020 - **0.059** - 0.079<br>③ 0.002 - **0.008** - 0.012 | ④ 0.020 - **0.059** - 0.079<br>⑤ 0.002 - **0.008** - 0.016 | ☆ 390 - **590** - 820 | ★ 390 - **590** - 820 | - | - | - |
| | Alloy Steel | ① 0.020 - **0.032** - 0.039<br>③ 0.002 - **0.004** - 0.008 | ① 0.020 - **0.039** - 0.059<br>③ 0.002~**0.006**~0.012 | ① 0.020 - **0.047** - 0.071<br>③ 0.002 - **0.008** - 0.012 | ① 0.020 - **0.059** - 0.079<br>③ 0.002 - **0.008** - 0.012 | ④ 0.020 - **0.059** - 0.079<br>⑤ 0.002 - **0.008** - 0.016 | ☆ 330 - **520** - 720 | ★ 330 - **520** - 720 | - | - | - |
| | Mold Steel (~40HRc) | ① 0.020 - **0.028** - 0.032<br>③ 0.002 - **0.003** - 0.006 | ① 0.020 - **0.032** - 0.047<br>③ 0.002 - **0.004** - 0.008 | ① 0.020 - **0.039** - 0.063<br>③ 0.002 - **0.006** - 0.008 | ① 0.020 - **0.047** - 0.071<br>③ 0.002 - **0.006** - 0.008 | ④ 0.020 - **0.047** - 0.071<br>⑤ 0.002 - **0.006** - 0.012 | ☆ 260 - **460** - 590 | ★ 260 - **460** - 590 | - | - | - |
| | Mold Steel (40~50HRc) | ① 0.008 - **0.012** - 0.020<br>③ 0.001 - **0.002** - 0.004 | ① 0.008 - **0.020** - 0.032<br>③ 0.001 - **0.003** - 0.006 | ① 0.008 - **0.024** - 0.035<br>③ 0.001 - **0.004** - 0.006 | ① 0.008 - **0.028** - 0.039<br>③ 0.001 - **0.004** - 0.006 | ④ 0.008 - **0.028** - 0.039<br>⑤ 0.001 - **0.004** - 0.008 | ☆ 200 - **330** - 430 | ★ 200 - **330** - 430 | - | - | - |
| | Austenitic Stainless Steel | ① 0.020 - **0.028** - 0.032<br>③ 0.002 - **0.003** - 0.006 | ① 0.020 - **0.032** - 0.047<br>③ 0.002 - **0.004** - 0.008 | ① 0.020 - **0.039** - 0.063<br>③ 0.002 - **0.006** - 0.008 | ① 0.020 - **0.047** - 0.071<br>③ 0.002 - **0.006** - 0.008 | ④ 0.020 - **0.047** - 0.071<br>⑤ 0.002 - **0.006** - 0.012 | ★ 330 - **520** - 660 | ☆ 330 - **520** - 660 | - | - | - |
| | Martensitic Stainless Steel | ① 0.020 - **0.028** - 0.032<br>③ 0.002 - **0.003** - 0.006 | ① 0.020 - **0.032** - 0.047<br>③ 0.002 - **0.004** - 0.008 | ① 0.020 - **0.039** - 0.063<br>③ 0.002 - **0.006** - 0.008 | ① 0.020 - **0.047** - 0.071<br>③ 0.002 - **0.006** - 0.008 | ④ 0.020 - **0.047** - 0.071<br>⑤ 0.002 - **0.006** - 0.012 | ☆ 490 - **660** - 820 | - | - | - | ★ 590 - **790** - 980 |
| | Precipitation Hardened Stainless Steel | ① 0.020 - **0.028** - 0.032<br>③ 0.002 - **0.003** - 0.006 | ① 0.020 - **0.032** - 0.047<br>③ 0.002 - **0.004** - 0.008 | ① 0.020 - **0.039** - 0.063<br>③ 0.002 - **0.006** - 0.008 | ① 0.020 - **0.047** - 0.071<br>③ 0.002 - **0.006** - 0.008 | ④ 0.020 - **0.047** - 0.071<br>⑤ 0.002 - **0.006** - 0.012 | ★ 300 - **390** - 490 | - | - | - | - |
| | Gray Cast Iron | ① 0.020 - **0.032** - 0.039<br>③ 0.002 - **0.004** - 0.008 | ① 0.020 - **0.039** - 0.059<br>③ 0.002 - **0.006** - 0.012 | ① 0.020 - **0.047** - 0.071<br>③ 0.002 - **0.008** - 0.012 | ① 0.020 - **0.059** - 0.079<br>③ 0.002 - **0.008** - 0.012 | ④ 0.020 - **0.059** - 0.079<br>⑤ 0.002 - **0.008** - 0.016 | - | - | ★ 390 - **590** - 820 | - | - |
| | Nodular Cast Iron | ① 0.020 - **0.028** - 0.032<br>③ 0.002 - **0.003** - 0.006 | ① 0.020 - **0.032** - 0.047<br>③ 0.002 - **0.004** - 0.008 | ① 0.020 - **0.039** - 0.063<br>③ 0.002 - **0.006** - 0.008 | ① 0.020 - **0.047** - 0.071<br>③ 0.002 - **0.006** - 0.008 | ④ 0.020 - **0.047** - 0.071<br>⑤ 0.002 - **0.006** - 0.012 | - | - | ★ 330 - **490** - 660 | - | - |
| | Ni-base Heat Resistant Alloy | ① 0.008 - **0.016** - 0.024<br>③ 0.001 - **0.002** - 0.004 | ① 0.008 - **0.020** - 0.035<br>③ 0.001 - **0.003** - 0.006 | ① 0.008 - **0.024** - 0.039<br>③ 0.001 - **0.004** - 0.006 | ① 0.008 - **0.032** - 0.047<br>③ 0.001 - **0.004** - 0.006 | ④ 0.008 - **0.032** - 0.047<br>⑤ 0.001 - **0.004** - 0.008 | ☆ 70 - **100** - 160 | - | - | - | ★ 70 - **100** - 160 |
| | Titanium Alloy | ① 0.008 - **0.016** - 0.024<br>③ 0.001 - **0.002** - 0.004 | ① 0.008 - **0.020** - 0.035<br>③ 0.001 - **0.003** - 0.006 | ① 0.008 - **0.024** - 0.039<br>③ 0.001 - **0.004** - 0.006 | ① 0.008 - **0.032** - 0.047<br>③ 0.001 - **0.004** - 0.006 | ④ 0.008 - **0.032** - 0.047<br>⑤ 0.001 - **0.004** - 0.008 | ★ 130 - **200** - 260 | - | ☆ 100 - **160** - 230 | - | - |

① **For D.O.C. ≤ 0.039"**
② **For D.O.C. 0.040 - 0.059"**
③ **For D.O.C. 0.040 - 0.138"**
④ **For D.O.C. ≤ 0.079"**
⑤ **For D.O.C. 0.080 - 0.197"**

- Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy
- The figure in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
- Machining with CAT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions
- Internal coolant is recommended for slotting applications
- For finishing, maximum recommended feed is f = 0.059 ipt for **SOMT14-LD** type, f = 0.035 ipt for **SOMT10-LD** type, f = 0.118 ipt for **SOMT14-FL** type, f = 0.055 ipt for **SOMT10-FL** type

# MFH | Recommended Cutting Conditions ★ 1st Recommendation ☆ 2nd Recommendation

| Chipbreaker | Workpiece | Holder Part Number and Feed Rate (fz: ipt) | | | | | Recommended Insert Grade (Vc: sfm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | End Mill Feed Rates | | | Face Mill Feed Rates | | MEGACOAT NANO | | | MEGACOAT HARD | CVD Coated Carbide |
| | | MFH1000 MFH25- | MFH1250 MFH32- | MFH1500 MFH40- | MFH···R-10 | MFH····14 | **PR1535** | **PR1525** | **PR1510** | **PR015S** | **CA6535** |
| FL | Carbon Steel | ① 0.020 - **0.032** - 0.039<br>② 0.008 - **0.016** - 0.020 | ① 0.020 - **0.039** - 0.059<br>② 0.012 - **0.028** - 0.039 | ① 0.020 - **0.047** - 0.071<br>② 0.016 - **0.039** - 0.059 | 0.020 - **0.059** - 0.079 | | ☆ 390 - **590** - 820 | ★ 390 - **590** - 820 | - | - | - |
| | Alloy Steel | ① 0.020 - **0.032** - 0.039<br>② 0.008 - **0.016** - 0.020 | ① 0.020 - **0.039** - 0.059<br>② 0.012 - **0.028** - 0.039 | ① 0.020 - **0.047** - 0.071<br>② 0.016 - **0.039** - 0.059 | 0.020 - **0.059** - 0.079 | | ☆ 330 - **520** - 720 | ★ 330 - **520** - 720 | - | - | - |
| | Mold Steel (~40HRc) | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | ☆ 260 - **460** - 590 | ★ 260 - **460** - 590 | - | - | - |
| | Mold Steel (40~50HRc) | ① 0.006 - **0.012** - 0.020<br>② 0.006 - **0.008** - 0.010 | ① 0.008 - **0.020** - 0.032<br>② 0.008 - **0.012** - 0.018 | ① 0.008 - **0.024** - 0.035<br>② 0.008 - **0.020** - 0.028 | 0.008 - **0.028** - 0.039 | | ☆ 200 - **330** - 430 | ★ 200 - **330** - 430 | - | - | - |
| | Austenitic Stainless Steel | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | ★ 330 - **520** - 660 | ☆ 330 - **520** - 660 | - | - | - |
| | Martensitic Stainless Steel | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | ☆ 490 - **660** - 820 | - | - | - | ★ 590 - **790** - 980 |
| | Precipitation Hardened Stainless Steel | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | ★ 300 - **390** - 490 | - | - | - | - |
| | Gray Cast Iron | ① 0.020 - **0.032** - 0.039<br>② 0.008 - **0.016** - 0.020 | ① 0.020 - **0.039** - 0.059<br>② 0.012 - **0.028** - 0.039 | ① 0.020 - **0.047** - 0.071<br>② 0.016 - **0.039** - 0.059 | 0.020 - **0.059** - 0.079 | | - | - | ★ 390 - **590** - 820 | - | - |
| | Nodular Cast Iron | ① 0.020 - **0.028** - 0.032<br>② 0.008 - **0.012** - 0.016 | ① 0.020 - **0.032** - 0.047<br>② 0.012 - **0.024** - 0.032 | ① 0.020 - **0.039** - 0.063<br>② 0.016 - **0.032** - 0.047 | 0.020 - **0.047** - 0.071 | | - | - | ★ 330 - **490** - 660 | - | - |
| | Ni-base Heat Resistant Alloy | ① 0.008 - **0.016** - 0.024<br>② 0.006 - **0.008** - 0.012 | ① 0.008 - **0.020** - 0.035<br>② 0.008 - **0.016** - 0.024 | ① 0.008 - **0.024** - 0.039<br>② 0.008 - **0.020** - 0.032 | 0.008 - **0.032** - 0.047 | | ☆ 70 - **100** - 160 | - | - | - | ★ 70 - **100** - 160 |
| | Titanium Alloy | ① 0.008 - **0.016** - 0.024<br>② 0.006 - **0.008** - 0.012 | ① 0.008 - **0.020** - 0.035<br>② 0.008 - **0.016** - 0.024 | ① 0.008 - **0.024** - 0.039<br>② 0.008 - **0.020** - 0.032 | 0.008 - **0.032** - 0.047 | | ★ 130 - **200** - 260 | - | ☆ 100 - **160** - 230 | - | - |

① **For D.O.C. ≤ 0.039"**
② **For D.O.C. 0.040 - 0.059"**
③ **For D.O.C. 0.040 - 0.138"**
④ **For D.O.C. ≤ 0.079"**
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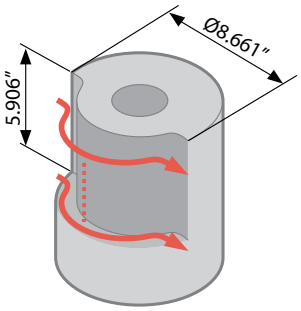
## Case Studies

### Construction Machine Parts 1025




Vc = 720 sfm (n = 1,750 rpm)
f = 0.028 ipr (Vf = 192.913 ipm)
D.O.C. × ae = 0.059" × 1.181", Dry
MFH1500-W150-10-4T
SOMT100420ER-GM PR1525

Cutting Time

**PR1525** **950** Sec

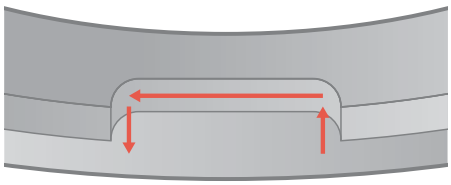
75% Cutting Time

Competitor N (90° Cutter) **3,800** Sec

PR1525 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 304

**Reduced Chattering**



Vc = 400 sfm (n = 1,190 rpm), fz = 0.047 ipt (Vf = 112.205 ipm)
D.O.C. × ae = 0.039" × 0.787", Dry
MFH1250-W125-10-2T (2 Flutes), SOMT100420ER-GM (PR1535)

Cutting Time

**PR1535** **58** cc/min

Machining Efficiency 1.6x

Competitor M **36** cc/min

PR1535 shows stable machining while Competitor M generated chattering.
PR1535 maintained a good cutting edge condition with stable machining.
(User Evaluation)

# MFH-RAPTOR MiNi

(Cutter Dia. Ø0.625" ~ Ø2.000")
(Cutter Dia. Ø16mm ~ Ø50mm)

## Economical Inserts with 4 Cutting Edges

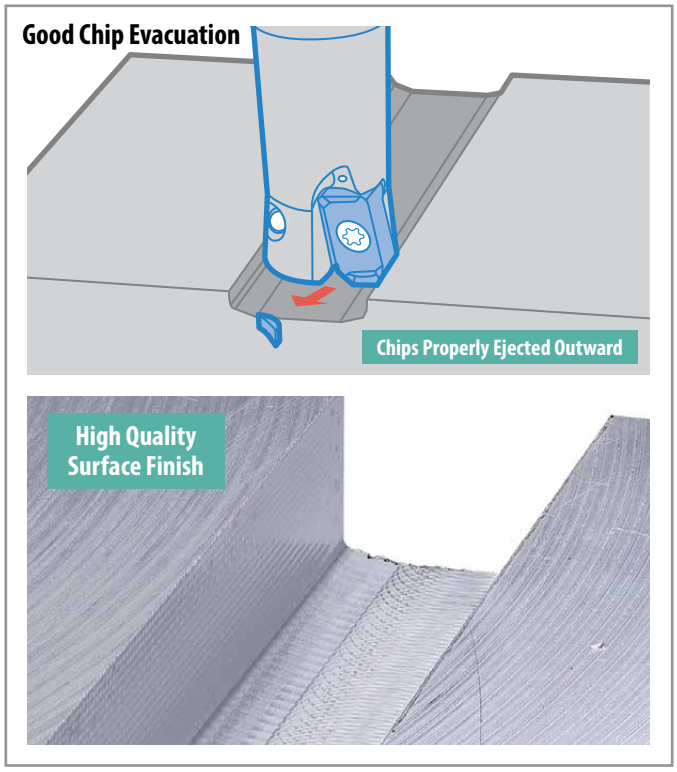
High Feed Milling for Small Diameters and Small Machining Centers

NEW GH Chipbreaker Now Available

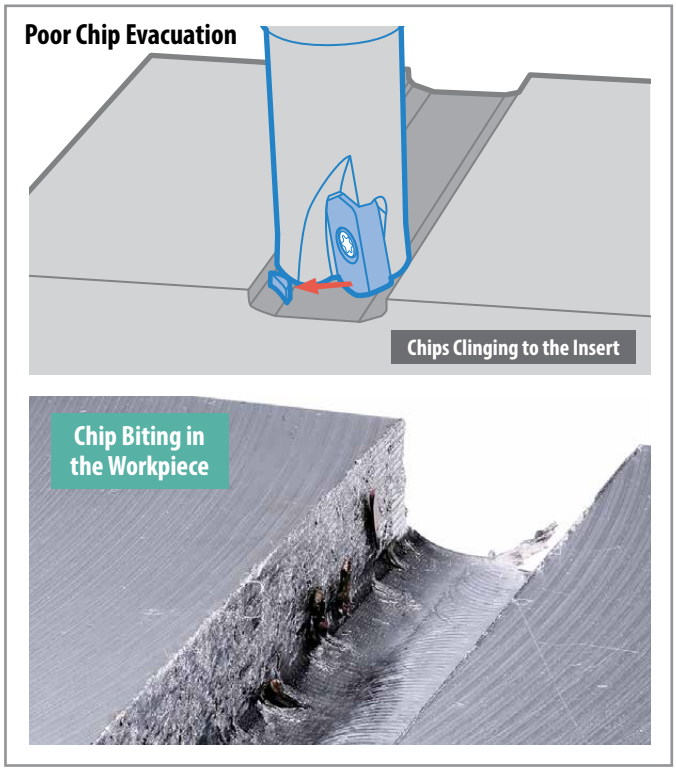
## 1 Good Chip Evacuation

**MFH Mini Controls Chip Biting with Convex Cutting Edge**

MFH Mini



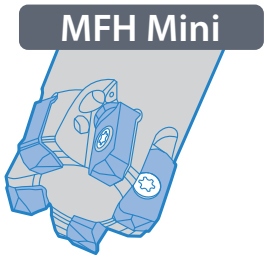

Competitor High Feed Cutter



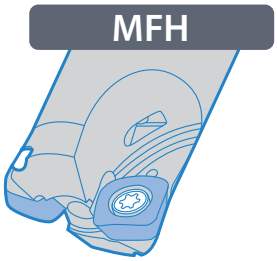

Cutting Conditions: Cutter Dia. DCX = Ø0.625" , Vc = 490 sfm, fz = 0.024 ipt, D.O.C. = 0.020" (20 Passes): Total 0.394" × 0.630", Dry Workpiece: Stainless Steel

## 2 Fine Pitch for Efficient Machining

**Cutter Dia. 1.000" Type**



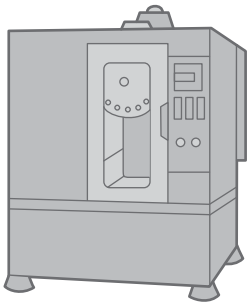

5 Inserts
**MFH1000-W100-03-5T47**




2 Inserts
**MFH1000-W100-10-2T**

## 3 Suitable for Roughing of Molds

**High Feed Machining in Small Machining Centers**



Standard (Cylindrical)

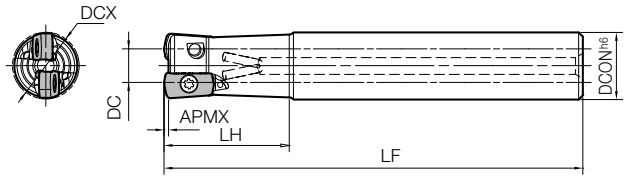



Fig.1

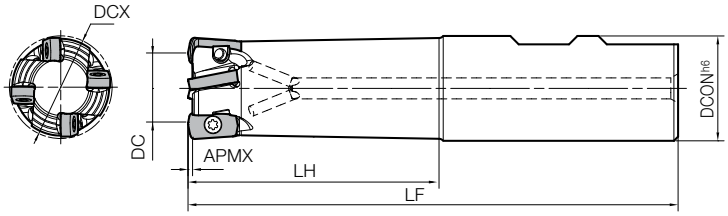



Fig.2

## Toolholder Dimensions (Inch Size)

| | Part Number | Stock | No. of Inserts | Dimensions (in) | | | | | | Ramping Angle | Rake Angle (°) | | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | DCON | LF | LH | APMX | RMPX | A.R. | R.R. | | | | |
| Standard Shank (Weldon) | MFH 0625-W625-03-2T-3 | ● | 2 | 0.625 | 0.310 | 0.625 | 3.196 | 1.250 | 0.039 | 2.8° | -10° | -15° | ✓ | Fig.2 | 0.1 | 18,800 |
| | 0750-W750-03-3T-4 | ● | 3 | 0.750 | 0.435 | 0.750 | 4.070 | 2.000 | 0.039 | 1.7° | -10° | -15° | | | 0.2 | 15,700 |
| | 1000-W100-03-4T47 | ● | 4 | 1.000 | 0.685 | 1.000 | 4.820 | 2.500 | 0.039 | 1.2° | -10° | -15° | | | 0.4 | 13,400 |
| | 1000-W100-03-5T47 | ● | 5 | 1.000 | 0.685 | 1.000 | 4.820 | 2.500 | 0.039 | 1.2° | -10° | -15° | | | 0.4 | 13,400 |
| | 1250-W125-03-5T-5 | ● | 5 | 1.250 | 0.935 | 1.250 | 5.070 | 2.750 | 0.039 | 0.8° | -10° | -15° | | | 0.7 | 11,400 |
| | 1250-W125-03-6T-5 | ● | 6 | 1.250 | 0.935 | 1.250 | 5.070 | 2.750 | 0.039 | 0.8° | -10° | -15° | | | 0.7 | 11,400 |
| Long Shank (Cylindrical) | MFH 0625-S625-03-2T-6 | ● | 2 | 0.625 | 0.310 | 0.625 | 6.000 | 2.000 | 0.039 | 2.8° | -10° | -15° | ✓ | Fig.1 | 0.2 | 18,800 |
| | 0750-S750-03-3T55 | ● | 3 | 0.750 | 0.435 | 0.750 | 5.500 | 2.000 | 0.039 | 1.7° | -10° | -15° | | | 0.3 | 15,700 |
| | 0750-S750-03-3T65 | ● | 3 | 0.750 | 0.435 | 0.750 | 6.500 | 3.000 | 0.039 | 1.7° | -10° | -15° | | | 0.3 | 15,700 |
| | 0875-S750-03-3T55 | ● | 3 | 0.875 | 0.560 | 0.750 | 5.500 | 2.000 | 0.039 | 1.3° | -10° | -15° | | | 0.3 | 14,700 |
| | 1000-S100-03-4T55 | ● | 4 | 1.000 | 0.685 | 1.000 | 5.500 | 2.500 | 0.039 | 1.2° | -10° | -15° | | | 0.5 | 13,400 |
| | 1000-S100-03-4T-7 | ● | 4 | 1.000 | 0.685 | 1.000 | 7.000 | 4.000 | 0.039 | 1.2° | -10° | -15° | | | 0.6 | 13,400 |
| | 1250-S125-03-5T62 | ● | 5 | 1.250 | 0.935 | 1.250 | 6.250 | 3.000 | 0.039 | 0.8° | -10° | -15° | | | 0.8 | 11,400 |
| | 1250-S125-03-5T-8 | ● | 5 | 1.250 | 0.935 | 1.250 | 8.000 | 4.750 | 0.039 | 0.8° | -10° | -15° | | | 1.1 | 11,400 |

● : Standard Item

## Spare Parts and Applicable Inserts (Inch Size)

| Part Number | Spare Parts | | | Applicable Inserts |
|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | P28 |
| |  |  |  | |
| MFH…-03-… | SB-3065TRP | DTPM-8<br>Recommended Torque for Insert Clamp 1.2 N·m | P-37 | LOGU030310ER-GM<br>LOGU030310ER-GH |

**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

Recommended Cutting Conditions P29

Standard (Cylindrical)

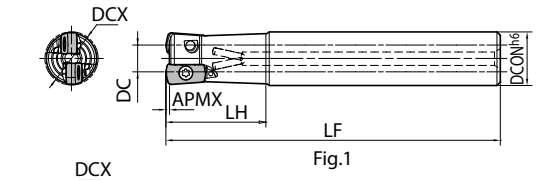



Fig.1

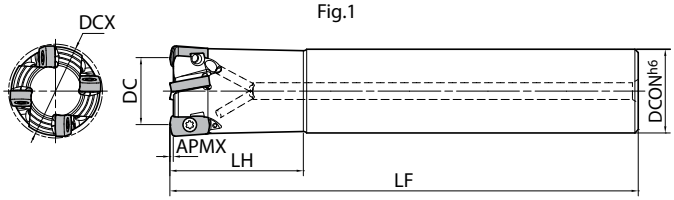



Fig.2

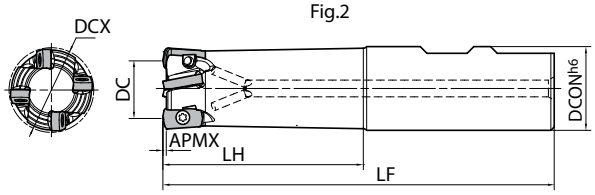



Fig.3

## Toolholder Dimensions (Metric Size)

| | Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | | Ramping Angle | Rake Angle (°) | | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | DCON | LF | LH | APMX | RMPX | A.R. | R.R. | | | | |
| Standard Shank (Cylindrical) | MFH 16-S16-03-2T | ● | 2 | 16 | 8 | 16 | 100 | 30 | 1 | 2.8° | -10° | -15° | ✓ | Fig.1 | 0.1 | 18,800 |
| | 17-S16-03-2T | ● | 2 | 17 | 9 | 16 | 100 | 20 | 1 | 2.5° | -10° | -15° | ✓ | Fig.2 | 0.1 | 17,900 |
| | 18-S16-03-2T | ● | 2 | 18 | 10 | 16 | 100 | 20 | 1 | 2.1° | -10° | -15° | | | 0.1 | 17,000 |
| | 20-S20-03-3T | ● | 3 | 20 | 12 | 20 | 130 | 50 | 1 | 1.7° | -10° | -15° | ✓ | Fig.1 | 0.3 | 15,700 |
| | 20-S20-03-4T | ● | 4 | 20 | 12 | 20 | 130 | 50 | 1 | 1.7° | -10° | -15° | | | 0.3 | 15,700 |
| | 22-S20-03-3T | ● | 3 | 22 | 14 | 20 | 130 | 30 | 1 | 1.4° | -10° | -15° | ✓ | Fig.2 | 0.3 | 14,700 |
| | 22-S20-03-4T | ● | 4 | 22 | 14 | 20 | 130 | 30 | 1 | 1.4° | -10° | -15° | | | 0.3 | 14,700 |
| | 25-S25-03-4T | ● | 4 | 25 | 17 | 25 | 140 | 60 | 1 | 1.2° | -10° | -15° | ✓ | Fig.1 | 0.5 | 13,400 |
| | 25-S25-03-5T | ● | 5 | 25 | 17 | 25 | 140 | 60 | 1 | 1.2° | -10° | -15° | | | 0.5 | 13,400 |
| | 28-S25-03-4T | ● | 4 | 28 | 20 | 25 | 140 | 40 | 1 | 1.0° | -10° | -15° | ✓ | Fig.2 | 0.5 | 12,400 |
| | 28-S25-03-5T | ● | 5 | 28 | 20 | 25 | 140 | 40 | 1 | 1.0° | -10° | -15° | | | 0.5 | 12,400 |
| | 32-S32-03-5T | ● | 5 | 32 | 24 | 32 | 150 | 70 | 1 | 0.8° | -10° | -15° | ✓ | Fig.1 | 0.8 | 11,400 |
| | 32-S32-03-6T | ● | 6 | 32 | 24 | 32 | 150 | 70 | 1 | 0.8° | -10° | -15° | | | 0.8 | 11,400 |
| Standard Shank (Weldon) | MFH 16-W16-03-2T | ● | 2 | 16 | 8 | 16 | 79 | 30 | 1 | 2.8° | -10° | -15° | | | 0.1 | 18,800 |
| | 20-W20-03-3T | ● | 3 | 20 | 12 | 20 | 101 | 50 | 1 | 1.7° | -10° | -15° | | | 0.2 | 15,700 |
| | 20-W20-03-4T | ● | 4 | 20 | 12 | 20 | 101 | 50 | 1 | 1.7° | -10° | -15° | | | 0.2 | 15,700 |
| | 25-W25-03-4T | ● | 4 | 25 | 17 | 25 | 117 | 60 | 1 | 1.2° | -10° | -15° | ✓ | Fig.3 | 0.4 | 13,400 |
| | 25-W25-03-5T | ● | 5 | 25 | 17 | 25 | 117 | 60 | 1 | 1.2° | -10° | -15° | | | 0.4 | 13,400 |
| | 32-W32-03-5T | ● | 5 | 32 | 24 | 32 | 131 | 70 | 1 | 0.8° | -10° | -15° | | | 0.7 | 11,400 |
| | 32-W32-03-6T | ● | 6 | 32 | 24 | 32 | 131 | 70 | 1 | 0.8° | -10° | -15° | | | 0.7 | 11,400 |
| Long Shank (Cylindrical) | MFH 16-S16-03-2T-150 | ● | 2 | 16 | 8 | 16 | 150 | 50 | 1 | 2.8° | -10° | -15° | | | 0.2 | 18,800 |
| | 20-S20-03-3T-160 | ● | 3 | 20 | 12 | 20 | 160 | 80 | 1 | 1.7° | -10° | -15° | ✓ | Fig.1 | 0.3 | 15,700 |
| | 25-S25-03-4T-180 | ● | 4 | 25 | 17 | 25 | 180 | 100 | 1 | 1.2° | -10° | -15° | | | 0.6 | 13,400 |
| | 32-S32-03-5T-200 | ● | 5 | 32 | 24 | 32 | 200 | 120 | 1 | 0.8° | -10° | -15° | | | 1.1 | 11,400 |

● : Standard Item

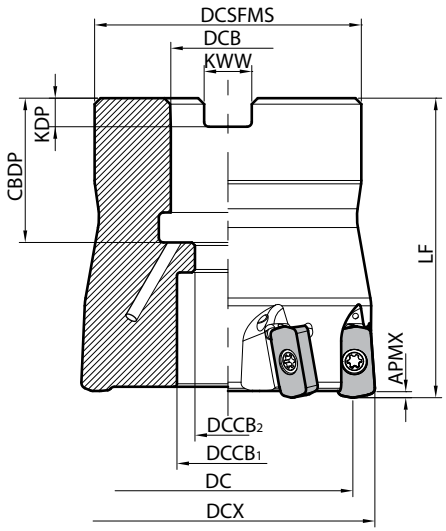
## Spare Parts and Applicable Inserts (Inch Size)

| Part Number | Spare Parts | | | Applicable Inserts |
|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | P28 |
| |  |  |  | |
| MFH…-03-… | SB-3065TRP | DTPM-8<br>Recommended Torque for Insert Clamp 1.2 N-m | P-37 | LOGU030310ER-GM<br>LOGU030310ER-GH |

**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

Recommended Cutting Conditions P29




## Toolholder Dimensions (Inch Size)

| Part Number | Stock | No. of Inserts | Dimensions (in) | | | | | | | | | | | Rake Angle (°) | | Coolant Hole | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DCX | DC | DCSFMS | DCB | $DCCB_1$ | $DCCB_2$ | LF | CBDP | KDP | KWW | APMX | A.R. | R.R. | | | |
| MFH 1500R-03-5T | ● | 5 | 1.500 | 1.185 | 1.400 | 0.500 | 0.433 | 0.276 | 1.575 | 0.709 | 0.156 | 0.250 | 0.039 | -10° | -15° | ✓ | 0.2 | 10,200 |
| 1500R-03-6T | ● | 6 | | | | | | | | | | | | | | | | |
| 2000R-03-8T | ● | 8 | 2.000 | 1.685 | 1.750 | 0.750 | 0.669 | 0.433 | 1.968 | 0.947 | 0.188 | 0.312 | 0.039 | -10° | -15° | ✓ | 0.5 | 8,600 |
| NEW 2000R-03-9T | ● | 9 | | | | | | | | | | | | | | | | |

## Toolholder Dimensions (Metric Size)

| Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | | | | | | | Rake Angle (°) | | Coolant Hole | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DCX | DC | DCSFMS | DCB | $DCCB_1$ | $DCCB_2$ | LF | CBDP | KDP | KWW | APMX | A.R. | R.R. | | | |
| MFH 040R-03-5T-M | ● | 5 | 40 | 32 | 38 | 16 | 15 | 9 | 40 | 19 | 5.6 | 8.4 | 1 | -10° | -15° | ✓ | 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 | 1 | -10° | -15° | ✓ | 0.5 | 8,600 |

**Multiple step slot milling is NOT recommended for MFH-Mini face mill diameters above Ø1.300" due to a danger of re-cutting chips**

● : Standard Item

## Spare Parts and Applicable Inserts (Inch Size)

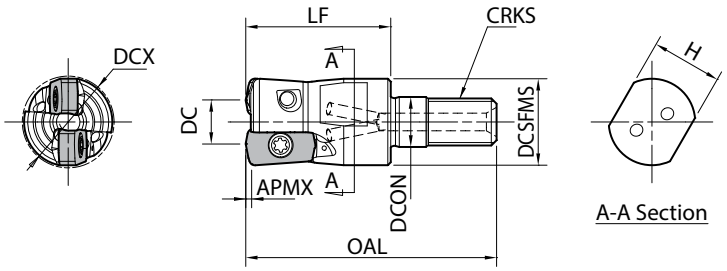
| Part Number | Spare Parts | | | | Applicable Inserts P28 |
|---|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | Arbor Bolt | |
| |  |  |  |  | |
| MFH1500R-03-5T | SB-3065TRP | DTPM-8 Recommended Torque for Insert Clamp 1.2 N·m | P-37 | HH1/4-0.75(H) | LOGU030310ER-GM LOGU030310ER-GH |
| MFH1500R-03-6T | | | | | |
| MFH2000R-03-8T | | | | HH3/8-1.25(H) | |
| MFH2000R-03-9T | | | | | |

(H) Optional coolant-through bolt available

**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

Recommended Cutting Conditions P29




## Toolholder Dimensions

| Part Number | Stock | Unit | No. of Inserts | Dimensions | | | | | | | | | Ramping Angle | Rake Angle (°) | | Coolant Hole | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | DCSFMS | DCON | OAL | LF | CRKS (mm) | H | APMX | RMPX | A.R. | R.R. | | |
| **MFH 0625-M08-03-2T** | ● | inch | 2 | 0.625 | 0.310 | 0.579 | 0.335 | 1.693 | 0.984 | M8xP1.25 | 0.472 | 0.039 | 2.8° | -10° | -15° | ✓ | 18,800 |
| **MFH 0750-M10-03-3T** | ● | | 3 | 0.750 | 0.435 | 0.728 | 0.413 | 1.929 | 1.181 | M10xP1.5 | 0.591 | 0.039 | 1.7° | -10° | -15° | ✓ | 15,700 |
| **MFH 1000-M12-03-4T** | ● | | 4 | 1.000 | 0.685 | 0.906 | 0.492 | 2.244 | 1.378 | M12xP1.75 | 0.748 | 0.039 | 1.2° | -10° | -15° | ✓ | 13,400 |
| **1000-M12-03-5T** | ● | | 5 | 1.000 | 0.685 | 0.906 | 0.492 | 2.244 | 1.378 | M12xP1.75 | 0.748 | 0.039 | 1.2° | -10° | -15° | ✓ | 13,400 |
| **MFH 1250-M16-03-5T** | ● | | 5 | 1.250 | 0.935 | 1.181 | 0.669 | 2.480 | 1.575 | M16xP2 | 0.945 | 0.039 | 0.8° | -10° | -15° | ✓ | 11,400 |
| **1250-M16-03-6T** | ● | | 6 | 1.250 | 0.935 | 1.181 | 0.669 | 2.480 | 1.575 | M16xP2 | 0.945 | 0.039 | 0.8° | -10° | -15° | ✓ | 11,400 |
| **MFH 1500-M16-03-6T** | ● | | 6 | 1.500 | 1.185 | 1.181 | 0.669 | 2.480 | 1.575 | M16xP2 | 0.945 | 0.039 | 0.5° | -10° | -15° | ✓ | 10,200 |
| **MFH 16-M08-03-2T** | ● | mm | 2 | 16 | 8 | 14.7 | 8.5 | 43 | 25 | M8xP1.25 | 12 | 1 | 2.8° | -10° | -15° | ✓ | 18,880 |
| **MFH 17-M08-03-2T** | ● | | 2 | 17 | 9 | 14.7 | 8.5 | 43 | 25 | M8xP1.25 | 12 | 1 | 2.5° | -10° | -15° | ✓ | 17,900 |
| **MFH 18-M08-03-2T** | ● | | 2 | 18 | 10 | 14.7 | 8.5 | 43 | 25 | M8xP1.25 | 12 | 1 | 2.1° | -10° | -15° | ✓ | 17,000 |
| **MFH 20-M10-03-3T** | ● | | 3 | 20 | 12 | 18.7 | 10.5 | 49 | 30 | M10xP1.5 | 15 | 1 | 1.7° | -10° | -15° | ✓ | 15,700 |
| **20-M10-03-4T** | ● | | 4 | 20 | 12 | 18.7 | 10.5 | 49 | 30 | M10xP1.5 | 15 | 1 | 1.7° | -10° | -15° | ✓ | 15,700 |
| **MFH 22-M10-03-3T** | ● | | 3 | 22 | 14 | 18.7 | 10.5 | 49 | 30 | M10xP1.5 | 15 | 1 | 1.4° | -10° | -15° | ✓ | 14,700 |
| **22-M10-03-4T** | ● | | 4 | 22 | 14 | 18.7 | 10.5 | 49 | 30 | M10xP1.5 | 15 | 1 | 1.4° | -10° | -15° | ✓ | 14,700 |
| **MFH 25-M12-03-4T** | ● | | 4 | 25 | 17 | 23 | 12.5 | 57 | 35 | M12xP1.75 | 19 | 1 | 1.2° | -10° | -15° | ✓ | 13,400 |
| **25-M12-03-5T** | ● | | 5 | 25 | 17 | 23 | 12.5 | 57 | 35 | M12xP1.75 | 19 | 1 | 1.2° | -10° | -15° | ✓ | 13,400 |
| **MFH 28-M12-03-4T** | ● | | 4 | 28 | 20 | 23 | 12.5 | 57 | 35 | M12xP1.75 | 19 | 1 | 1.0° | -10° | -15° | ✓ | 12,400 |
| **28-M12-03-5T** | ● | | 5 | 28 | 20 | 23 | 12.5 | 57 | 35 | M12xP1.75 | 19 | 1 | 1.0° | -10° | -15° | ✓ | 12,400 |
| **MFH 32-M16-03-5T** | ● | | 5 | 32 | 24 | 30 | 17 | 63 | 40 | M16xP2 | 24 | 1 | 0.8° | -10° | -15° | ✓ | 11,400 |
| **32-M16-03-6T** | ● | | 6 | 32 | 24 | 30 | 17 | 63 | 40 | M16xP2 | 24 | 1 | 0.8° | -10° | -15° | ✓ | 11,400 |

● : Standard Item

## Spare Parts and Applicable Inserts

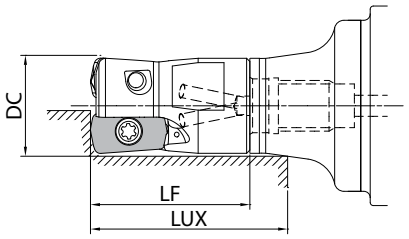
| Part Number | Spare Parts | | | Applicable Inserts P28 |
|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | |
| |  |  |  | |
| **MFH…-03-…** | SB-3065TRP | DTPM-8<br>Recommended Torque for Insert Clamp 1.2 N·m | P-37 | LOGU030310ER-GM<br>LOGU030310ER-GH |

**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

Recommended Cutting Conditions P29

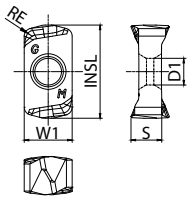
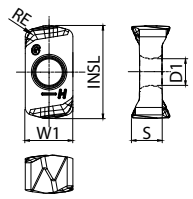
## Actual End Mill Depth (BT Arbor Metric)




| Arbor Part Number | Applicable End Mill | | | Actual End Mill Depth (mm) |
|---|---|---|---|---|
| | Part Number | Cutting Dia. (mm) | Dimension (mm) | LUX |
| | | DC | LF | |
| BT30K-M08-45 | MFH16-M08-03… | Ø16 | 25 | 31.8 |
| | MFH17-M08-03… | Ø17 | 25 | 33.2 |
| | MFH18-M08-03… | Ø18 | 25 | 34.2 |
| BT30K-M10-45 | MFH20-M10-03… | Ø20 | 30 | 36.8 |
| | MFH22-M10-03… | Ø22 | 30 | 39.2 |
| BT30K-M12-45 | MFH25-M12-03… | Ø25 | 35 | 42.8 |
| | MFH28-M12-03… | Ø28 | 35 | 45.5 |
| BT40K-M08-55 | MFH16-M08-03… | Ø16 | 25 | 31.7 |
| | MFH17-M08-03… | Ø17 | 25 | 33.2 |
| | MFH18-M08-03… | Ø18 | 25 | 34.3 |
| BT40K-M10-60 | MFH20-M10-03… | Ø20 | 30 | 38.7 |
| | MFH22-M10-03… | Ø22 | 30 | 44.5 |
| BT40K-M12-55 | MFH25-M12-03… | Ø25 | 35 | 44.6 |
| | MFH28-M12-03… | Ø28 | 35 | 47.6 |
| BT40K-M16-65 | MFH32-M16-03… | Ø32 | 40 | 51.2 |

For BT Arbor See P34

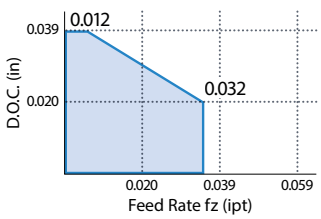
## Applicable Inserts

| Insert | | Part Number | Dimension (in) | | | | | MEGACOAT NANO | | | MEGACOAT HARD | CVD Coated Carbide |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | W1 | S | D1 | INSL | RE | PR1535 | PR1525 | PR1510 | PR015S | CA6535 |
|  General Purpose |  | LOGU030310ER-GM | 0.244 | 0.156 | 0.136 | 0.469 | 0.039 | ● | ● | ● | - | ● |
| NEW  Tough Edge |  | LOGU030310ER-GH | 0.244 | 0.156 | 0.136 | 0.469 | 0.039 | ● | ● | ● | ● | - |

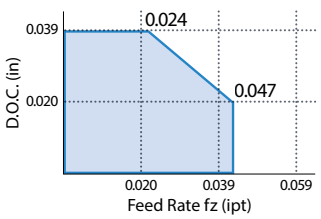
● : Standard Item

## MFH Mini | Cutting Performance

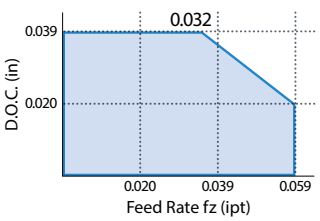
### Fine Pitch End Mill



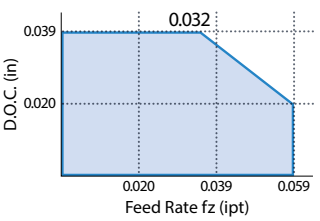

### Standard Pitch End Mill
Cutting Dia. Ø0.625" - Ø0.750"
Cutting Dia. Ø16mm - Ø22mm




### Standard Pitch End Mill
Cutting Dia. 1.000" - 1.250"
Cutting Dia. Ø25mm - Ø32mm




### MFH Mini Face Mill
Cutting Dia. 1.500" - 2.000"
Cutting Dia. Ø40mm - Ø50mm




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

# Recommended Cutting Conditions ★ 1st Recommendation ☆ 2nd Recommendation

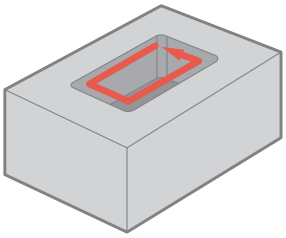
| Chipbreaker | Workpiece Material | Holder Part Number and Feed Rate (fz: ipt) *Recommended D.O.C. = 0.020" Reference Value* | | | | | | | | Recommended Insert Grade (Vc: sfm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MFH0625...2T (MFH16...2T) | MFH0750...3T (MFH20...3T) | (MFH20...4T) | MFH1000...4T (MFH25...4T) | MFH1000...5T (MFH25...5T) | MFH1250...5T (MFH32...5T) | MFH1250...6T (MFH32...6T) | MFH1500...5T/6T MFH2000...8T | MEGACOAT NANO | | | MEGACOAT HARD | CVD Coated Carbide |
| | | | | | | | | | | PR1535 | PR1525 | PR1510 | PR015S | CA6535 |
| | Carbon Steel | 0.008-**0.028**-0.047 | | 0.008-**0.020**-0.031 | 0.008-**0.031**-0.059 | 0.008-**0.020**-0.031 | 0.008-**0.031**-0.059 | 0.008-**0.020**-0.031 | 0.008-**0.031**-0.059 | ☆ 390-**590**-820 | ★ 390-**590**-820 | - | - | - |
| | Alloy Steel | | | | | | | | | ☆ 330-**520**-720 | ★ 330-**520**-720 | - | - | - |
| | Mold Steel ~40 HRc | 0.008-**0.020**-0.035 | | 0.008-**0.016**-0.024 | 0.008-**0.024**-0.047 | 0.008-**0.016**-0.024 | 0.008-**0.024**-0.047 | 0.008-**0.016**-0.024 | 0.008-**0.024**-0.047 | ☆ 260-**460**-590 | ☆ 260-**460**-590 | - | **GH** ★ 260-**460**-590 | - |
| | Mold Steel 40~50 HRc | 0.008-**0.012**-0.020 | | 0.008-**0.010**-0.012 | 0.008-**0.012**-0.024 | 0.008-**0.010**-0.012 | 0.009-**0.012**-0.024 | 0.008-**0.010**-0.012 | 0.008-**0.012**-0.024 | - | ☆ 200-**330**-430 | - | **GH** ★ 200-**330**-430 | - |
| | Mold Steel 50~55 HRc | 0.004-**0.012**-0.020 | | 0.004-**0.008**-0.012 | 0.004-**0.012**-0.020 | 0.004-**0.008**-0.012 | 0.004-**0.012**-0.020 | 0.004-**0.008**-0.012 | 0.004-**0.008**-0.012 | - | ☆ 160-**230**-330 | - | **GH** ★ 160-**230**-330 | - |
| | Mold Steel 55~60 HRc | 0.0004-**0.0024**-0.0039 (Recommended only with GH chipbreaker) | | | | | | | | - | - | - | **GH** ★ 160-**200**-230 | - |
| **GM GH** | Austenitic Stainless Steel | 0.008-**0.020**-0.035 | | 0.008-**0.016**-0.024 | 0.008-**0.024**-0.047 | 0.008-**0.016**-0.024 | 0.008-**0.024**-0.047 | 0.008-**0.016**-0.024 | 0.008-**0.024**-0.047 | **GM** ★ 330-**520**-660 | **GM** ☆ 330-**520**-660 | - | - | - |
| | Martensitic Stainless Steel | | | | | | | | | ☆ 490-**660**-820 | - | - | - | ★ 590-**790**-980 |
| | Precipitation Hardened Stainless Steel | | | | | | | | | ★ 300-**390**-490 | - | - | - | - |
| | Gray Cast Iron | 0.008-**0.028**-0.047 | | 0.008-**0.020**-0.031 | 0.008-**0.031**-0.059 | 0.008-**0.020**-0.031 | 0.008-**0.031**-0.059 | 0.008-**0.020**-0.031 | 0.008-**0.031**-0.059 | - | - | ★ 390-**590**-820 | - | - |
| | Nodular Cast Iron | 0.008-**0.020**-0.035 | | 0.008-**0.016**-0.024 | 0.008-**0.024**-0.047 | 0.008-**0.016**-0.024 | 0.008-**0.024**-0.047 | 0.008-**0.016**-0.024 | 0.008-**0.024**-0.047 | - | - | ★ 330-**490**-660 | - | - |
| | Ni-base Heat-Resistant Alloy | 0.008-**0.012**-0.024 | | 0.008-**0.010**-0.016 | 0.008-**0.016**-0.031 | 0.008-**0.010**-0.016 | 0.008-**0.016**-0.031 | 0.008-**0.010**-0.016 | 0.008-**0.016**-0.031 | ☆ 70-**100**-160 | - | - | - | ★ 70-**100**-160 |
| | Titanium Alloy | | | | | | | | | **GM** ★ 130-**200**-260 | - | **GM** ☆ 100-**160**-230 | - | - |

- Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy
- The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
- Machining with CAT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions
- Internal coolant is recommended for slotting applications
- Slotting and pocketing are not recommended for face mill types

Standard Pitch End Mills | Fine Pitch End Mills | MFH Mini Face Mills

## Case Studies

### Mold Parts
Pre-hardended Steel



Vc = 720 sfm (n = 3,500 rpm)
f = 0.002 ipt (Vf = 27.559 ipm)
D.O.C. x ae = 0.002" x 0.551", Dry
MFH20-S20-03-4T
LOGU030310ER-GM PR1535

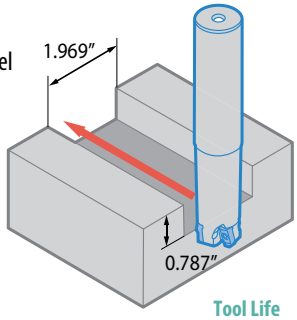
Tool Life

| | | |
|---|---|---|
| **PR1535** | **2.0** H | Tool Life MAX 2x |
| Competitor K (4 Flutes) | **1.0~1.5** H | |

PR1535 shows lower cutting load compared with Competitor K making it possible to extend the machining time.

(User Evaluation)

### Airplane Parts
Precipitation Hardened Stainless Steel




Vc = 390 sfm ( n = 1,530 rpm)
fz = 0.024 ipt (Vf = 144.488 ipm)
D.O.C. × ae = 0.028" × 0.984" Dry
MFH1000-W100-03-4T47 (4 Flutes)
LOGU030310ER-GM (PR1535)

Machining Efficiency

| | | |
|---|---|---|
| **PR1535** | **100** pcs | Tool Life 1.8x |
| Competitor L (5 Inserts) | **55** pcs | |

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

(User Evaluation)

# MFH-RAPTOR MICRO

(Cutter Dia. Ø0.375" ~ Ø0.625")
(Cutter Dia. Ø8mm ~ Ø16mm)

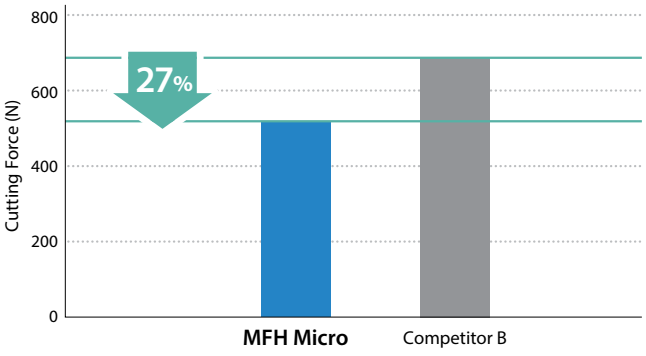
## Low Resistance and Durable Design Aids in Chatter Resistant Machining

Maximum D.O.C. 0.020" and Stable High Feed Machining on a Wide Range of Applications

## 1 Stable Machining with Chattering Resistance

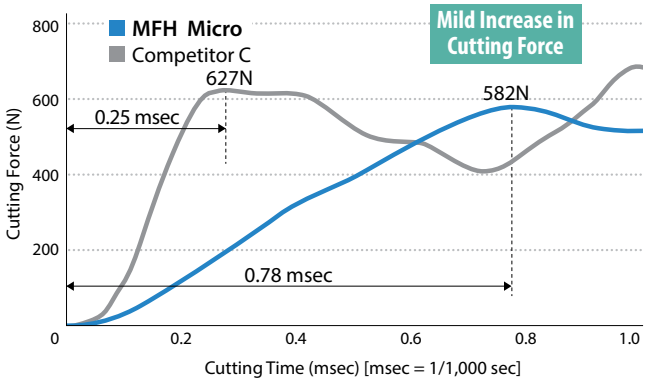
### Molded Convex Cutting Edge Controls Initial Impact when Entering the Workpiece

Cutting Force Comparison (In-house Evaluation)




Cutting Conditions: Vc = 390 sfm, fz = 0.024 ipt, D.O.C. = 0.016"
Cutter Dia. Ø0.375", Slotting, Dry Workpiece: 1049

Increase in Cutting Force when Entering Work Piece
(In-house Evaluation)



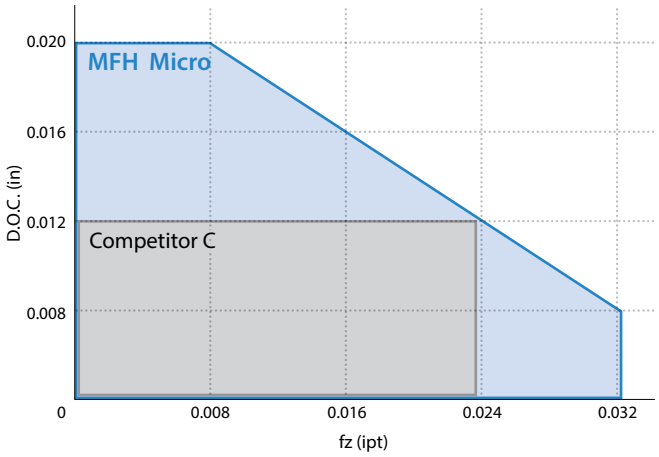

Cutting Conditions: Vc = 390 sfm, fz = 0.024 ipt, D.O.C. × ae = 0.016" × 0.197"
Cutter Dia. Ø0.375", Dry Workpiece: 1049

## 2 Wide Range of Machining Applications

### Wide Range of Machining Applications at a Maximum Depth of Cut of 0.020"

### Stable Machining Even with Small Machining Centers

Cutting Performance Map (Cutter Dia. Ø0.375")




(Internal Evaluation)

## 3 Can Replace Solid End Mills to Reduce Machining Costs

### Suppresses Chattering and Increases Milling Efficiency

MFH Micro Compared to Solid End Mills (Mechanical Parts Slotting 1049)

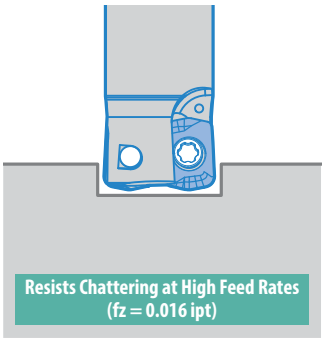
**MFH Micro Q = 15.3 cc/min**

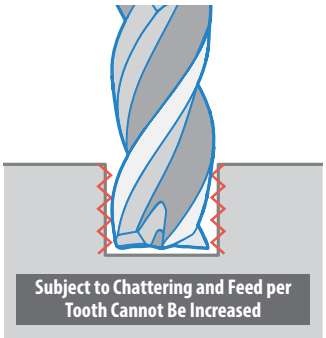
Vc = 490 sfm, fz = 0.016 ipt
D.O.C. × ae = 0.016" × 0.394", Dry
MFH10-S10-01-2T (2 Flutes)
LPGT010210ER-GM (PR1525)

1.2x Machining Efficiency

**Solid End Mill Q = 12.2 cc/min**

Vc = 260 sfm, fz = 0.002 ipt
D.O.C. × ae = 0.012" × 0.394", Dry
Ø10mm (4 Flute)



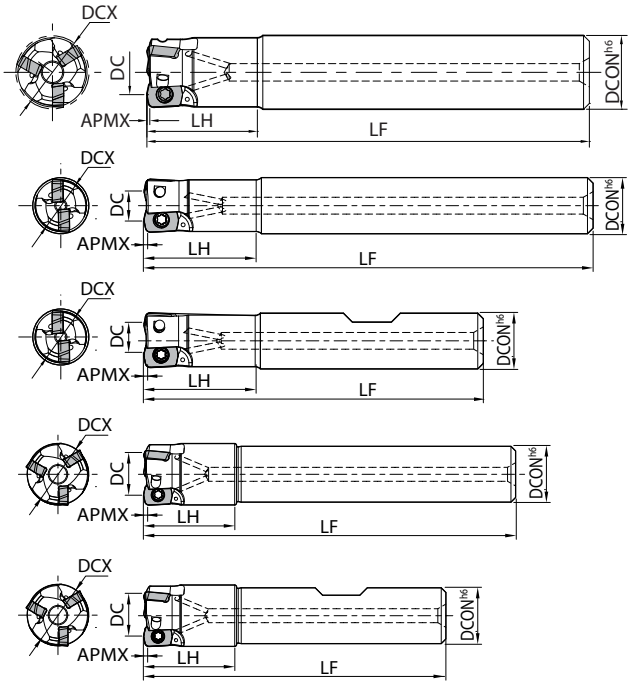



Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5

## Toolholder Dimensions (Inch Size)

| Shank | Part Number | Stock | No. of Inserts | Dimensions (in) | | | | | | Maximum Ramping Angle | Rake Angle (°) | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | DCON | LF | LH | APMX | RMPX | A.R. | | | | |
| Standard (Cylindrical) | MFH 0375-S375-01-1T-3 | ■ | 1 | 0.375 | 0.225 | 0.375 | 3.000 | 0.750 | 0.020 | 3° | +5° | ✓ | Fig. 1 | 0.04 | 16,200 |
| | 0394-S375-01-2T-3 | ● | 2 | 10mm | 0.244 | 0.375 | 3.000 | 0.750 | | 3° | | | | 0.04 | 16,200 |
| | 0500-S500-01-3T-3 | ● | 3 | 0.500 | 0.350 | 0.500 | 3.000 | 0.750 | | 2° | | | | 0.07 | 14,000 |
| | 0500-S500-01-3T-5 | ● | 3 | 0.500 | 0.350 | 0.500 | 5.000 | 0.750 | | 2° | | | | 0.11 | 14,000 |
| | 0625-S625-01-4T35 | ● | 4 | 0.625 | 0.475 | 0.625 | 3.500 | 1.000 | | 1.2° | | | | 0.12 | 11,400 |

● : Standard Item ■ : Quoted Item (Made to Order)

## Toolholder Dimensions (Metric Size)

| Shank | Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | | Maximum Ramping Angle | Rake Angle (°) | Coolant Hole | Drawing | Weight (kg) | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | DCON | LF | LH | APMX | α | A.R. | | | | |
| Standard (Cylindrical) | MFH 08-S10-01-1T | ● | 1 | 8 | 4.2 | 10 | 75 | 16 | 0.5 | 4° | +5° | ✓ | Fig. 2 | 0.04 | 20,000 |
| | 10-S10-01-2T | ● | 2 | 10 | 6.2 | 10 | 80 | 20 | | 3° | | | | 0.04 | 16,200 |
| | 12-S12-01-3T | ● | 3 | 12 | 8.2 | 12 | 80 | 20 | | 2° | | | | 0.06 | 14,000 |
| | 16-S16-01-4T | ● | 4 | 16 | 12.2 | 16 | 90 | 25 | | 1.2° | | | | 0.12 | 11,400 |
| Over Size (Cylindrical) | MFH 14-S12-01-3T | ● | 3 | 14 | 10.2 | 12 | 80 | 20 | 0.5 | 1.5° | +5° | ✓ | Fig. 4 | 0.07 | 12,500 |
| Standard (Weldon) | MFH 08-W10-01-1T | ● | 1 | 8 | 4.2 | 10 | 58 | 16 | 0.5 | 4° | +5° | ✓ | Fig. 3 | 0.03 | 20,000 |
| | 10-W10-01-2T | ● | 2 | 10 | 6.2 | 10 | 60 | 20 | | 3° | | | | 0.03 | 16,200 |
| | 12-W12-01-3T | ● | 3 | 12 | 8.2 | 12 | 65 | 20 | | 2° | | | | 0.05 | 14,000 |
| | 16-W16-01-4T | ● | 4 | 16 | 12.2 | 16 | 73 | 25 | | 1.2° | | | | 0.1 | 11,400 |
| Over Size (Weldon) | MFH 14-W12-01-3T | ● | 3 | 14 | 10.2 | 12 | 65 | 20 | 0.5 | 1.5° | +5° | ✓ | Fig. 5 | 0.05 | 12,500 |

● : Standard Item

## Spare Parts and Applicable Inserts

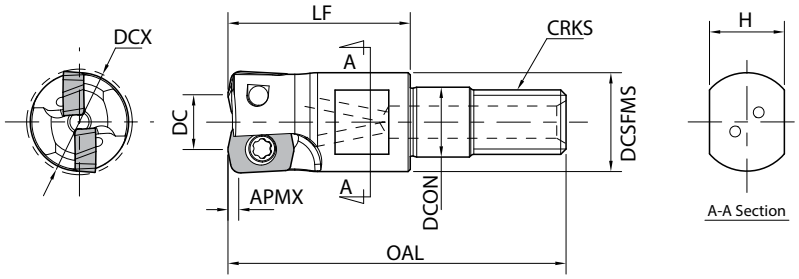
| Part Number | Spare Parts | | | Applicable Inserts |
|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | P32 |
| |  |  |  | |
| MFH...-01-... | SB-1840TRP | FTP-6 | P-37 | LPGT010210ER-GM |

Recommended Torque for Insert Screw 1.2 N·m

**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

Recommended Cutting Conditions P33




## Toolholder Dimensions (Metric Size)

| Part Number | Stock | Unit | No. of Inserts | Dimensions (mm) | | | | | | | | | Maximum Ramping Angle | A.R. | Coolant Hole | Max. RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DCX | DC | DCSFMS | DCON | OAL | LF | CRKS | H | APMX | RMPX | | | |
| MFH 0500-M06-01-3T | ● | inch | 3 | 0.500 | 0.350 | 0.441 | 0.256 | 1.240 | 0.669 | M6xP1.0 | 0.276 | 0.020 | 2° | +5° | ✓ | 14,000 |
| 0625-M08-01-4T | ● | | 4 | 0.625 | 0.475 | 0.579 | 0.335 | 1.575 | 0.866 | M8xP1.25 | 0.472 | | 1.2° | | | 11,400 |
| MFH 08-M06-01-1T | ● | mm | 1 | 8 | 4.2 | 9.2 | 6.5 | 31.5 | 17 | M6×P1.0 | 7 | 0.5 | 4° | | | 20,000 |
| 10-M06-01-2T | ● | | 2 | 10 | 6.2 | | | | | | | | 3° | | | 16,200 |
| 12-M06-01-3T | ● | | 3 | 12 | 8.2 | 11.2 | | | | | | | 2° | | | 14,000 |
| 14-M06-01-3T | ● | | 3 | 14 | 10.2 | | | | | | | | 1.5° | | | 12,500 |
| 16-M08-01-4T | ● | | 4 | 16 | 12.2 | 14.7 | 8.5 | 40 | 22 | M8×P1.25 | 12 | | 1.2° | | | 11,400 |

Industry standard threads for adapting to common toolholders (For Ø8mm - Ø14mm screw size: M6 x P1.0).
Check screw specifications for the shank in use.

● : Standard Item

## Spare Parts and Applicable Inserts

| Part Number | Spare Parts | | | Applicable Inserts See Below |
|---|---|---|---|---|
| | Insert Screw | Wrench | Anti-Seize Compound | |
| |  |  |  | |
| MFH…-01-… | SB-1840TRP | FTP-6 | P-37 | LPGT010210ER-GM |

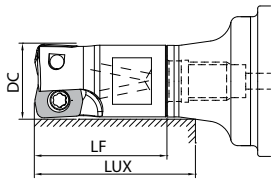
Recommended Torque for Insert Clamp 1.2 N·m

**Caution with Max. Revolution**
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

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

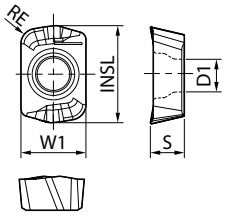
Recommended Cutting Conditions ➔ **P33**

## Actual End Mill Depth (MFH16-M080-01-4T)



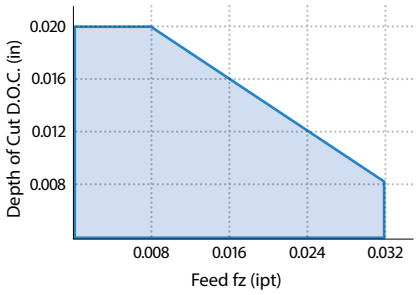

| Arbor Part Number | Applicable End Mill | | | Actual End Mill Depth (mm) |
|---|---|---|---|---|
| | Part Number | Cutting Dia. (mm) | Dimension (mm) | |
| | | DC | LF | LUX |
| BT30K-M08-45 | MFH16-M08-01… | Ø16 | 22 | 28.8 |
| BT40K-M08-55 | MFH16-M08-01… | Ø16 | 22 | 28.7 |

# MFH Micro | Applicable Inserts

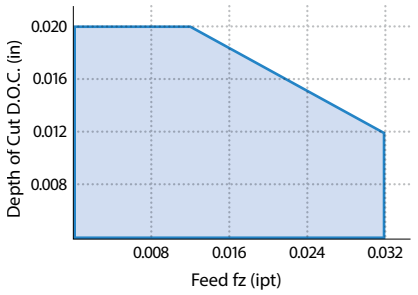
| Insert | | Part Number | Dimension (in) | | | | | MEGACOAT NANO | | CVD |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | W1 | S | D1 | INSL | RE | PR1535 | PR1525 | CA6535 |
|  General Purpose |   | LPGT010210ER-GM | 0.165 | 0.086 | 0.083 | 0.247 | 0.039 | ● | ● | ● |

● : Standard Item

Cutter Dia: Ø0.375" ~ Ø0.500"
Cutter Dia: Ø8mm ~ Ø12mm




Cutter Dia: Ø0.625"
Cutter Dia: Ø14mm ~ Ø16mm




## Recommended Cutting Conditions

★ 1st Recommendation ☆ 2nd Recommendation

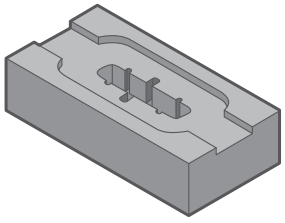
| Chipbreaker | Workpiece Material | Cutter Part Number and Feed Rate (fz: ipt) *Recommended D.O.C. = 0.012" Reference Value* | | | | | Recommended Insert Grade (Vc: sfm) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MFH08-...-1T | MFH0375...-1T-3<br>MFH0394...-2T-3<br>MFH10-...-2T | MFH0500-...-3T-..<br>MFH12-...-3T | MFH14-...-3T | MFH0625-...-4T(35)<br>MFH16-...-4T | MEGACOAT NANO | | CVD Coated Carbide |
| | | | | | | | PR1525 | PR1535 | CA6535 |
| GM | Carbon Steel | 0.008~**0.016**~0.024 | | | 0.008~**0.020**~0.031 | | ★ 390-**590**-820 | ☆ 390-**590**-820 | - |
| | Alloy Steel | | | | | | ★ 330-**520**-720 | ☆ 330-**520**-720 | - |
| | Mold Steel ( ~40 HRc) | 0.008~**0.012**~0.020 | | | 0.008~**0.016**~0.024 | | ★ 260-**460**-590 | ☆ 260-**460**-590 | - |
| | Mold Steel ( 40~50 HRc) | 0.008~**0.010**~0.012 | | | 0.008~**0.010**~0.016 | | ★ 200-**330**-430 | ☆ 200-**330**-430 | - |
| | Austenitic Stainless Steel | 0.008~**0.012**~0.020 | | | 0.008~**0.016**~0.024 | | ☆ 330-**520**-660 | ★ 330-**520**-660 | - |
| | Martensitic Stainless Steel | | | | | | - | ☆ 490-**660**-820 | ★ 590-**790**-980 |
| | Precipitation Hardened Stainless Steel | | | | | | - | ★ 300-**390**-490 | - |
| | Gray Cast Iron | 0.008~**0.016**~0.024 | | | 0.008~**0.020**~0.031 | | ★ 390-**590**-820 | - | - |
| | Nodular Cast Iron | 0.008~**0.012**~0.020 | | | 0.008~**0.016**~0.024 | | ★ 330-**490**-660 | - | - |
| | Ni-base Heat-Resistant Alloy | 0.008~**0.010**~0.012 | | | 0.008~**0.010**~0.016 | | - | ☆ 70-**100**-160 | ★ 70-**100**-160 |
| | Titanium Alloy | | | | | | - | ★ 130-**200**-260 | - |

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

### Case Studies

**Mold H13**

Vc = 300 sfm (n = 2,400 rpm)
fz = 0.011 ipr
(Vf = 75.984 ipm)
D.O.C. × ae = 0.012" × ~ 0.028", Dry
MFH0500-S500-01-3T-3
LPGT010210ER-GM PR1535



Chip Evacuation

PR1535 **4.5** cc/min

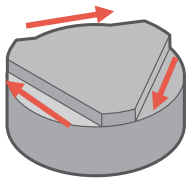
Competitor I **3.4** cc/min

Efficiency 1.3x

PR1535 shows 1.3 times machining efficiency compared to Competitor I
Good cutting edge condition after machining almost doubling the tool life
(User Evaluation)

**Industrial Machine Parts 440C**

Vc = 590 sfm (n = 3,580 rpm)
fz = 0.016 ipt (Vf = 225.591 ipm)
D.O.C. = 0.016", ae = 0.315", Wet
MFH0625-S625-01-4T35
LPGT010210ER-GM PR1535



Cutting Time

PR1535 **7** min

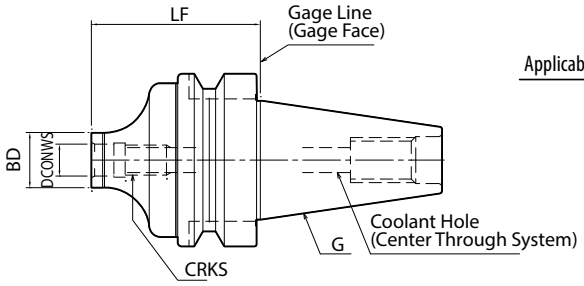
Competitor J **11** min

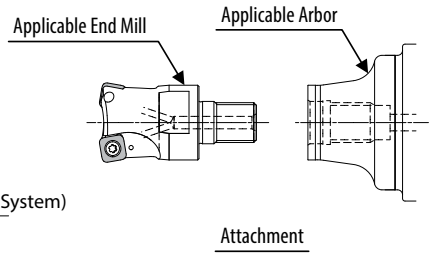
35% Cutting Time

PR1535 shows 30% faster cycle time compared to competitor J

(User Evaluation)

## BT Arbor (for Exchangeable Head / Two Face Contact)



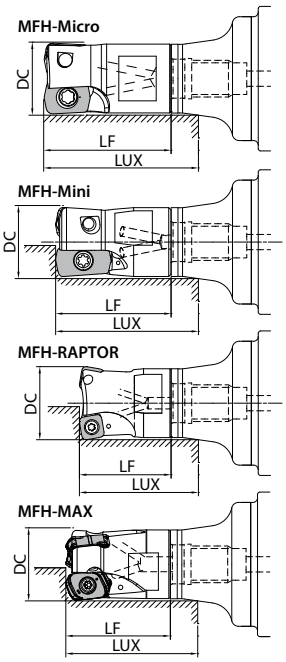




### Holder Dimensions

| Part Number | | Stock | Dimensions (mm) | | | | Coolant Hole | Arbor (Two Face Clamping) | Applicable End Mill (Head) |
|---|---|---|---|---|---|---|---|---|---|
| | | | L | BD | DCONWS | CRKS | | CCMS | |
| BT30K- | M08-45 | □ | 45 | 14.7 | 8.5 | M8×P1.25 | ✓ | BT30 | MFH..-M08-.. |
| | M10-45 | ● | 45 | 18.7 | 10.5 | M10×P1.5 | | BT30 | MFH..-M10-.. |
| | M12-45 | ● | 45 | 23 | 12.5 | M12×P1.75 | | BT30 | MFH..-M12-.. |
| BT40K- | M08-55 | □ | 55 | 14.7 | 8.5 | M8×P1.25 | ✓ | BT40 | MFH..-M08-.. |
| | M10-60 | □ | 60 | 18.7 | 10.5 | M10×P1.5 | | BT40 | MFH..-M10-.. |
| | M12-55 | □ | 55 | 23 | 12.5 | M12×P1.75 | | BT40 | MFH..-M12-.. |
| | M16-65 | □ | 65 | 30 | 17 | M16×P2.0 | | BT40 | MFH..-M16-.. |

● : Standard Item □ : Made to Order

### Actual End Mill Depth (BT Arbor Metric)




| Arbor Part Number | | Applicable End Mill | | | Actual End Mill Depth (mm) |
|---|---|---|---|---|---|
| | | Part Number | Cutting Dia. (mm) | Dimension (mm) | |
| | | | DC | LF | LUX |
| BT30K- | M08-45 | MFH16-M08-01… | 16 | 22 | 28.8 |
| | | MFH16-M08-03… | 16 | 25 | 31.8 |
| | | MFH17-M08-03… | 17 | 25 | 33.2 |
| | | MFH18-M08-03… | 18 | 25 | 34.2 |
| | M10-45 | MFH20-M10-03… | 20 | 30 | 36.8 |
| | | MFH22-M10-… | 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… | 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-M16-10… | 35 | 40 | 60.2 |
| | | MFH40-M16… | 40 | 40 | 64 |
| | | MFH42-M16… | 42 | 40 | 64 |

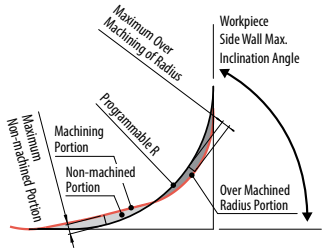
## Arbor Identification System

**BT30** - **K** - **M12** - **45**

- BT30: Arbor Size
- K: Two-Face Clamping Spindle
- M12: Thread Size for Clamping
- 45: Length from the Gage

## Approximate Programming Radius Adjustment

Shape




| MFH Micro | | | MFH Mini | | | MFH MAX | | |
|---|---|---|---|---|---|---|---|---|
| Programmable R (in) | Maximum Over Machining of Radius (in) | Over Machined Radius Portion (in) | Programmable R (in) | Maximum Over Machining of Radius (in) | Maximum Non-machined Portion (in) | Programmable R (in) | Maximum Over Machining of Radius (in) | Maximum Non-machined Portion (in) |
| R0.039 | 0 | 0.0083 | R0.063 (Recommended) | 0 | 0.0154 | R0.059 | 0 | 0.0559 |
| R0.047 (Recommended) | 0 | 0.0067 | R0.079 | 0.0035 | 0.0138 | R0.079 | 0 | 0.0488 |
| R0.059 | 0.0032 | 0.0039 | R0.098 | 0.0102 | 0.0102 | R0.118 (Recommended) | 0 | 0.0343 |
| R0.079 | 0.0110 | 0.0004 | R0.118 | 0.0181 | 0.0067 | 0.138 | 0.0024 | 0.0272 |

MFH Micro / MFH Mini: Cutting Edge Angle γ(°) = 12°, Side Wall Max. Inclination Angle = 90°

| MFH (GM / GH) | | | | | | |
|---|---|---|---|---|---|---|
| Cutter | Insert | Cutting Edge Angle γ (°) | Programmable R (in) (Recommended) | Maximum Over Machining of Radius (in) | Maximum Non-machined Portion (in) | Workpiece Side Wall Max. Inclination Angle |
| MFH... -10-... | GM / GH | 10° | R0.118 | 0 | 0.034 | 90° |
| | LD | 14° | R0.148 | 0 | 0.027 | 65° |
| | FL | 14° | R0.118 | 0 | 0.035 | 80° |
| MFH... -14-... | GM / GH | 10° | R0.148 | 0 | 0.054 | 90° |
| | LD | 16° | R0.197 | 0 | 0.042 | 65° |
| | FL | 13° | R0.118 | 0 | 0.054 | 80° |

## Ramping Reference Data

| Cutter Type | Cutter Dia. DCX (in) | - | 0.375" | 0.500" | - | 0.625" |
|---|---|---|---|---|---|---|
| | Cutter Dia. DCX (mm) | 8mm | 10mm | 12mm | 14mm | 16mm |
| MFH Micro | Max. Ramping Angle RMPX (°) | 4.0° | 3.0° | 2.0° | 1.5° | 1.2° |
| | tan RMPX | 0.070 | 0.052 | 0.035 | 0.026 | 0.021 |

| Cutter Type | Cutter Dia. DCX (in) | 0.625" | - | - | 0.750" | - | 0.875" | 1.000" | - | 1.250" | 1.500" | 2.000" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cutter Dia. DCX (mm) | 16mm | 17mm | 18mm | 20mm | 22mm | - | 25mm | 28mm | 32mm | 40mm | 50mm |
| MFH Mini | Max. Ramping Angle RMPX (°) | 2.8° | 2.5° | 2.1° | 1.7° | 1.4° | 1.3° | 1.2° | 1° | 0.8° | 0.5° | 0.4° |
| | tan RMPX | 0.049 | 0.042 | 0.037 | 0.030 | 0.024 | 0.023 | 0.021 | 0.017 | 0.014 | 0.009 | 0.007 |

| Cutter Type | Cutter Dia. DCX (in) | 1.000" | - | 1.250" | - | 1.500" | 2.000" | 2.500" | 3.000" |
|---|---|---|---|---|---|---|---|---|---|
| | Cutter Dia. DCX (mm) | 25mm | 28mm | 32mm | 35mm | 40mm | 50mm | 63mm | 80mm |
| MFH (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 |

| Cutter Type | Cutter Dia. DCX (in) | 2.000" | 2.500" | 3.000" | 4.000" | 5.000" | 6.000" |
|---|---|---|---|---|---|---|---|
| | Cutter Dia. DCX (mm) | 50mm | 63mm | 80mm | 100mm | 125mm | 160mm |
| MFH (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 |

| Cutter Type | Cutter Dia. DCX (in) | - | 1.000" | - | 1.250" | - | 1.500" | - | 2.000" | - | 2.500" | 3.000" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cutter Dia. DCX (mm) | 22mm | 25mm | 28mm | 32mm | 35mm | 40mm | 42mm | 50mm | 52mm | 63mm | 80mm |
| MFH MAX | 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 |

Decrease Ramping Angle if Chips Become Excessively Long

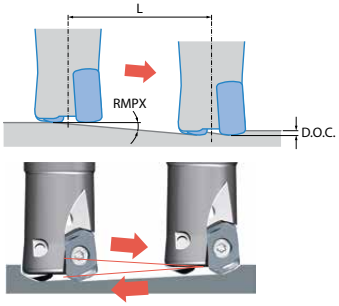
Ramping angle should be under RMPX (maximum ramping angle) in the cutting conditions above

Reduce recommended feed rate in recommended cutting conditions by 70%

Multiple step slot milling is NOT recommended for MFH-Mini face mill diameters above Ø1.3" due to a danger of re-cutting chips

Formula for Max. Cutting Length (L) at Max. Ramping Angle

$$L = \frac{D.O.C.}{\tan RMPX}$$



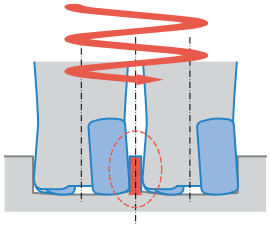

When ramping from both the front and outer periphery, set the maximum ramping angle RMPX to 50%.

## Helical Milling

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

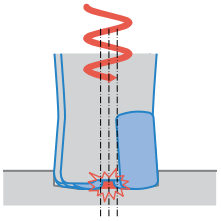
**Exceeding Max. Machining Dia.**

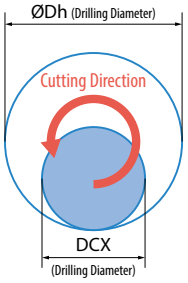
**Center Core Remains After Machining**



**Under Min. Machining Dia.**

**Center Core Hits Holder Body**






| Cutter Type | Min. Drilling Dia. | Max. Drilling Dia. | Max. Ramping Depth per Cycle |
|---|---|---|---|
| MFH Micro | 2xDCX-0.138" | 2xDCX-0.079" | 0.020" |
| MFH Mini | 2xDCX-0.315" | 2xDCX-0.079" | 0.039" |
| MFH (MFH...-10-...) | 2xDCX-0.709" | 2xDCX-0.079" | GM = 0.059" |
| MFH (MFH...-14-...) | 2xDCX-0.984" | 2xDCX-0.079" | GM = 0.079" |
| MFH MAX | 2xDCX-0.433" | 2xDCX-0.079" | 0.098" |

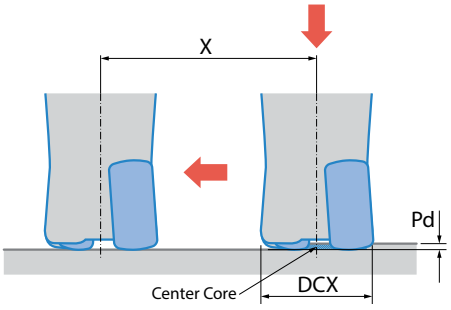
- Keep machine depth per rotation less than max D.O.C. (S) in cutter dimensions chart
- Use climb milling
- Feed rate should be reduced to 50% of the recommended cutting conditions
- Use caution to eliminate incidences caused by producing long chips

## Drilling

| Cutter Type | Max. Drilling Depth (Pd) | Min. Cutting Length (X) for Flat Bottom Surface |
|---|---|---|
| MFH Micro | 0.020" | DCX-0.138" |
| MFH Mini | 0.039" | DCX-0.354" |
| MFH MAX | 0.024" | DCX-0.472" |

Unit: inch

| Cutter Type | 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 (MFH...-10-...) | 0.059" | DCX-0.709" | 0.059" | DCX-0.551" | 0.059" | DCX-0.591" |
| MFH (MFH...-14-...) | 0.079" | DCX-0.945" | 0.079" | DCX-0.709" | 0.079" | DCX-0.748" |



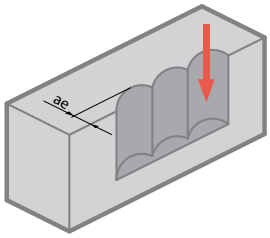

**[Drilling Depth]**
See Max. Drilling Depth (Pd) in the above cutting conditions

**Traversing after Drilling**

① It is recommended to reduce feed by 25% of recommendation until Center Core is removed

② Axial feed rate recommendation per revolution is 0.008 ipr while drilling

## Plunging



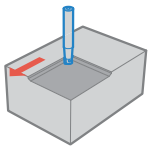

LD and FL chipbreakers are not available for plunging

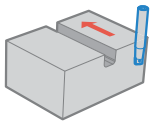
Reduce feed rate to fz ≤ 0.008ipt when plunging

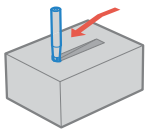
| Cutter Type | Insert | Maximum Width of Cut (ae) |
|---|---|---|
| MFH Micro | LPGT01... | 0.067" |
| MFH Mini | LOGU03... | 0.138" |
| MFH (MFH...-10-...) | SOMT10... | 0.315" |
| MFH (MFH...-14-...) | SOMT14... | 0.453" |
| MFH MAX | LOMU04... | 0.197" |

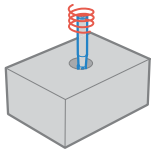
## 3D Machining

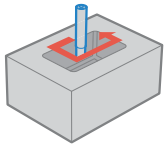
GM chipbreaker is available for all applications.

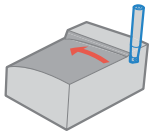

Face Milling & Shouldering


Slotting


Ramping


Helical Milling


Pocketing


Contouring

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

Some applications are not available depending on chipbreaker.

For FL and LD type, there is a limit of rising wall angle during contouring.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10/21