MFH Boost

NEW

High feed milling with larger depths of cut

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

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

High feed and large depth of cut milling

MFH Boost

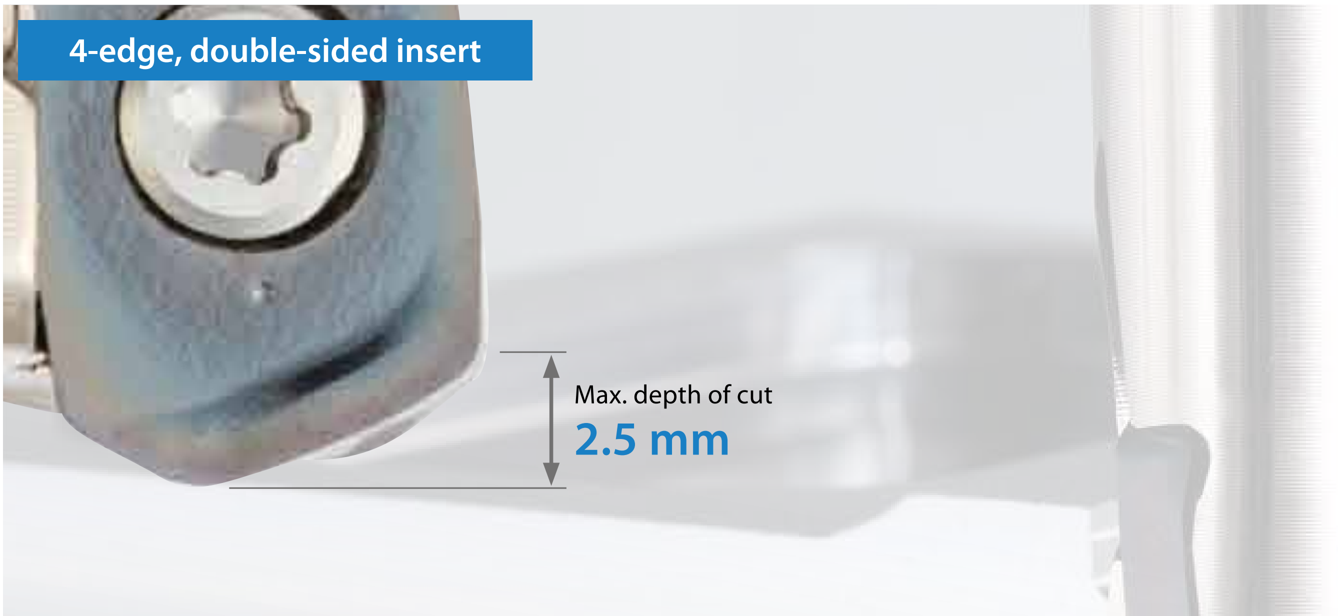
New addition to the MFH Series - High feed plus large D.O.C. for greater milling capabilities
Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials, and molds

Video

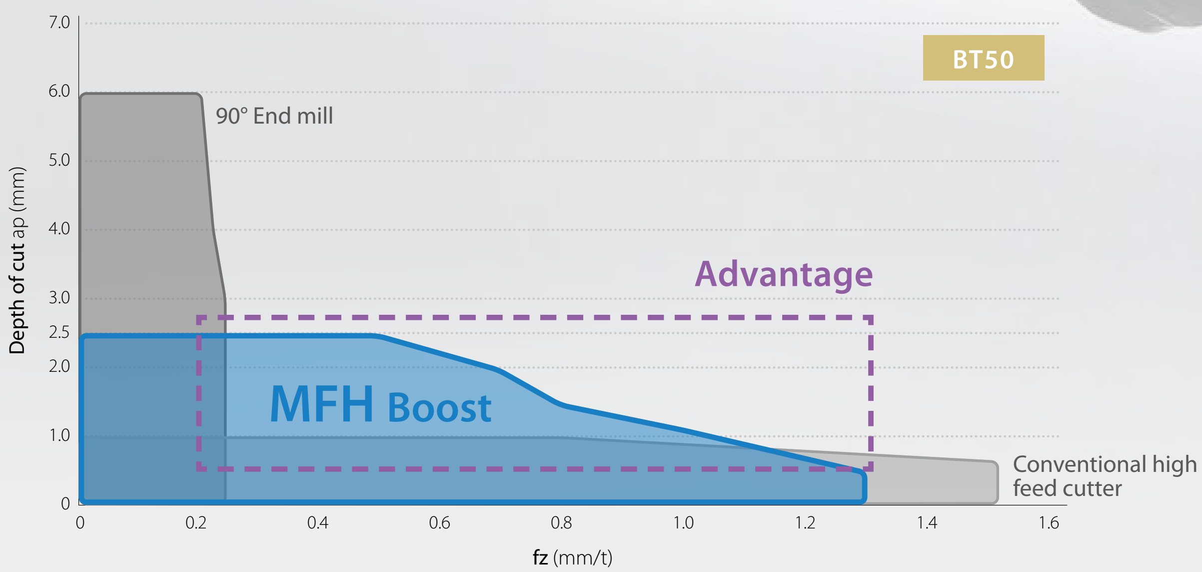
1 High feed milling with large depth of cut capabilities

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

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



MFH Boost Advantage



Vc = 150 m/min, ae = 12.5 mm (ae/DCX = 50%), C50, dry, ø 25, overhang length 60 mm, BT50

New value with 2.5 mm max. depth of cut

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

Automotive suspension parts

Automotive parts

General steel machining

- **Increased productivity with large D.O.C. machining**
- **High reliability in unstable machining environments**
  Long overhang length and better clamping rigidity
  Stable machining with low rigidity machines
- **High-efficiency ramping**
  Large ramping angle (Small dia. ø25mm: 3°)
  Dramatic efficiency improvement when ramping in pockets
- **Longer tool life with high-efficiency machining**

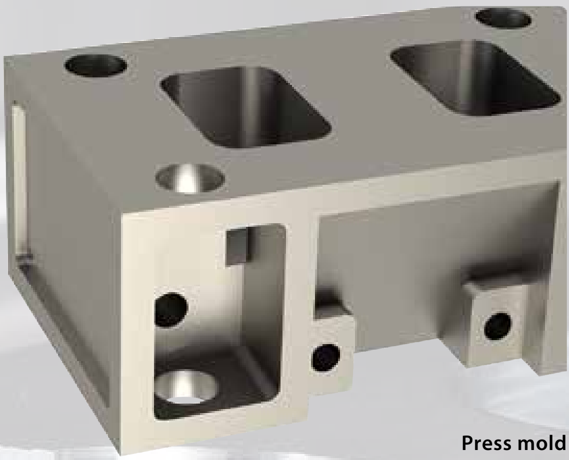
2 Provides a greater solution than **conventional high feed cutters**

General parts/mold (High roughing/facing)

General parts, pressing and die casting

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

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



Press mold

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

Aircraft landing gear parts

Aircraft/energy industry parts

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

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

Improving productivity and reducing machining costs

2 Available for a variety of machining applications and environments

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

High feed rates dramatically improve machining efficiency

Machining efficiency simulation example

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

MFH Boost
ø 25 (3 Inserts)

100 cc/min

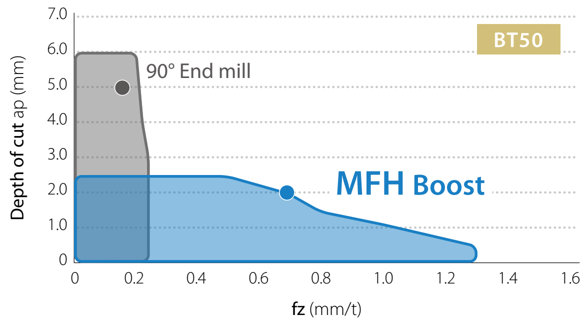
ap = **2.0** mm, fz = **0.7** mm/t

Conventional
90 ° end mill
ø 25 (3 Inserts)

54 cc/min

ap = **5.0** mm, fz = **0.15** mm/t

Machining efficiency x 1.8



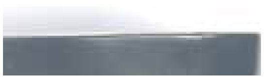
High efficiency and good tool life

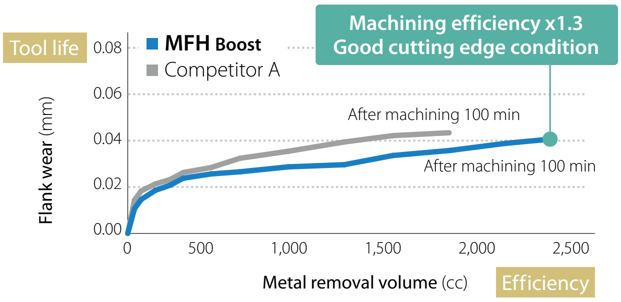
Machining efficiency and cutting edge condition comparison
(Internal evaluation)

Cutting edge condition after 100 min machining

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

Competitor A 90° end mill
ap = 5.0 mm, fz = **0.15** mm/t





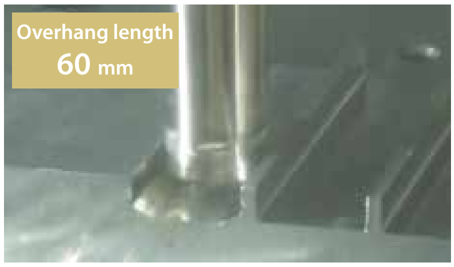
Vc = 150 m/min, ae = 12.5 mm, dry, 42CrMo4, ø 25 (1 Insert) BT50

High stability in unstable machining environment

Chatter resistance comparison (Internal evaluation)

Slotting
ø 25 (3 Inserts)
External air
C50
BT50

Video



Machining efficiency

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

Machining efficiency x 4.5

Competitor A
90 ° End mill

31 cc/min **Chattering (Machining was impossible)**
Vc = 80 m/min, ap = 2 mm, fz = 0.2 mm/t

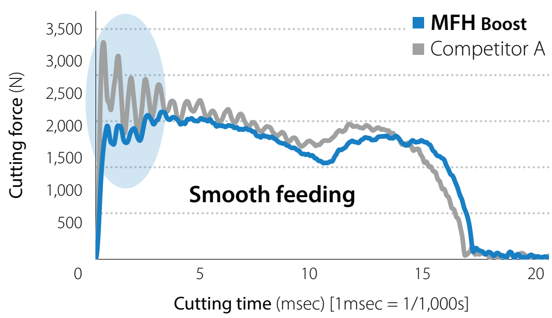
23 cc/min
Vc = 80 m/min, ap = 2 mm, fz = 0.15 mm/t

High efficiency and stable machining designs

Kyocera's original technology

Convex cutting edge design reduces impact when entering workpiece

Cutting force when entering workpiece (Internal evaluation)



Vc = 150 m/min, ap = 2.0 mm, ae = 25 mm, fz = 0.7 mm/t, dry, C50, ø 50 (1 Insert), BT50

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

Large D.O.C. dramatically improves machining efficiency

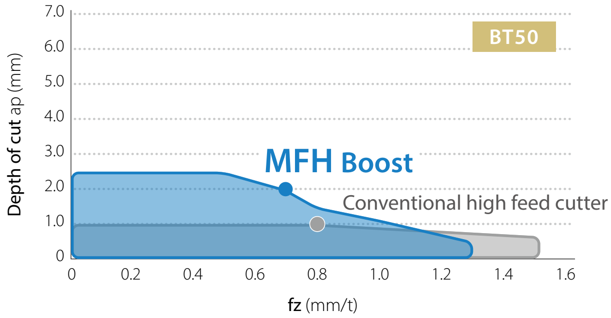
Machining efficiency simulation example

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

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

Machining efficiency x 1.3

Conventional high feed cutter
ø 25 (3 Inserts)
76 cc/min
ap = **1.0** mm, fz = **0.8** mm/t

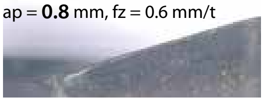


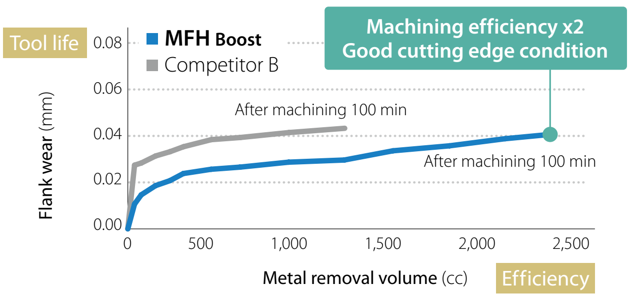
High efficiency and good tool life

Machining efficiency and cutting edge condition comparison
(Internal evaluation)

Cutting edge condition after 100 min machining

MFH Boost	Competitor B High feed type
ap = **1.6** mm, fz = 0.6 mm/t	ap = **0.8** mm, fz = 0.6 mm/t





Vc = 150 m/min, ae = 12.5 mm, dry, 42CrMo4, ø 25 (1 Insert), BT50

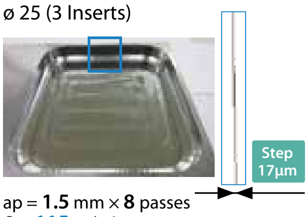
Excellent wall accuracy

Video

Machining efficiency and wall accuracy comparison
(Internal evaluation)

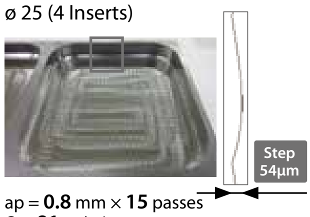
Pocketing (Depth 12mm)

MFH Boost
ø 25 (3 Inserts)



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

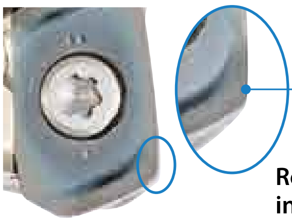
Competitor B High feed type
ø 25 (4 Inserts)



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

Cutting conditions: Vc = 200 m/min, ae = 12.5 mm, fz = 0.8 mm/t, dry, C50, BT50

Superior wall accuracy



Wiper on outer periphery

Reduction of wall level variation in multi-pass machining

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

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

Machining efficiency comparison (Internal evaluation)

Titanium alloy pocketing (Depth 6 mm)

Machining efficiency x 1.8

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

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

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

Video

MFH Boost End mill

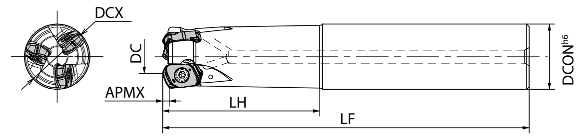


Fig.1

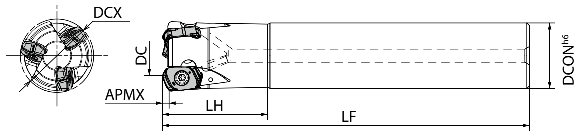


Fig.2

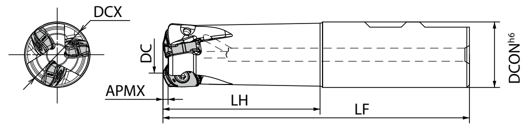


Fig.3

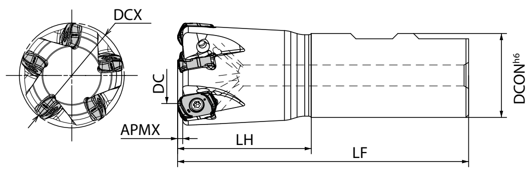


Fig.4

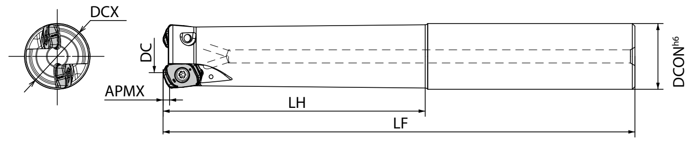


Fig.5

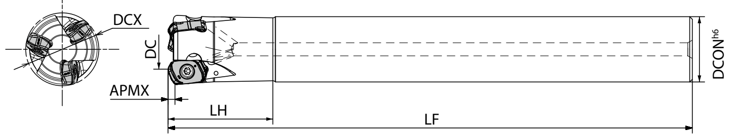


Fig.6

Toolholder dimensions

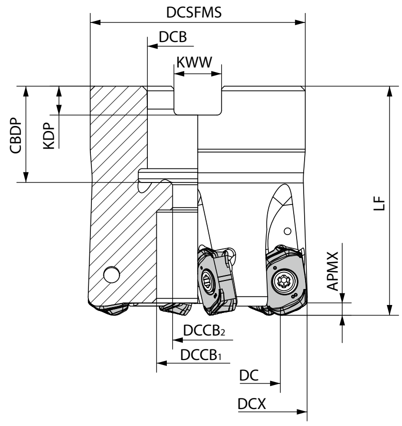
<table>
<tr><th rowspan="2">Shank</th><th rowspan="2" colspan="2">Description</th><th rowspan="2">Availability</th><th rowspan="2">No. of inserts</th><th colspan="6">Dimensions (mm)</th><th>Rake angle</th><th rowspan="2">Coolant hole</th><th rowspan="2">Shape</th><th rowspan="2">Weight (kg)</th><th rowspan="2">Max. revolution (min⁻¹)</th></tr>
<tr><th>DCX</th><th>DC</th><th>DCON</th><th>LH</th><th>LF</th><th>APMX</th><th>A.R.</th></tr>
<tr><td rowspan="4">Standard (Straight)</td><td rowspan="4">MFH</td><td>25-S25-04-2T</td><td>●</td><td>2</td><td rowspan="2">25</td><td rowspan="2">14</td><td rowspan="2">25</td><td rowspan="2">60</td><td rowspan="2">140</td><td rowspan="4">2.5</td><td rowspan="4">-10°</td><td rowspan="4">Yes</td><td rowspan="4">Fig.1</td><td>0.5</td><td rowspan="2">12,700</td></tr>
<tr><td>25-S25-04-3T</td><td>●</td><td>3</td><td>0.5</td></tr>
<tr><td>32-S32-04-4T</td><td>●</td><td>4</td><td rowspan="2">32</td><td rowspan="2">21</td><td rowspan="2">32</td><td rowspan="2">70</td><td rowspan="2">150</td><td>0.8</td><td rowspan="2">11,200</td></tr>
<tr><td>32-S32-04-5T</td><td>●</td><td>5</td><td>0.8</td></tr>
<tr><td rowspan="7">Over Size (Straight)</td><td rowspan="7">MFH</td><td>22-S20-04-2T</td><td>●</td><td>2</td><td>22</td><td>11</td><td>20</td><td>30</td><td>130</td><td rowspan="7">2.5</td><td rowspan="7">-10°</td><td rowspan="7">Yes</td><td rowspan="7">Fig.2</td><td>0.3</td><td>13,600</td></tr>
<tr><td>28-S25-04-3T</td><td>●</td><td>3</td><td rowspan="2">28</td><td rowspan="2">17</td><td rowspan="2">25</td><td rowspan="2">40</td><td rowspan="2">140</td><td>0.5</td><td rowspan="2">12,000</td></tr>
<tr><td>28-S25-04-4T</td><td>●</td><td rowspan="2">4</td><td>0.5</td></tr>
<tr><td>35-S32-04-4T</td><td>●</td><td rowspan="2">35</td><td rowspan="2">24</td><td rowspan="4">32</td><td rowspan="4">50</td><td rowspan="4">150</td><td>0.8</td><td rowspan="2">10,700</td></tr>
<tr><td>35-S32-04-5T</td><td>●</td><td rowspan="2">5</td><td>0.8</td></tr>
<tr><td>40-S32-04-5T</td><td>●</td><td rowspan="2">40</td><td rowspan="2">29</td><td>0.9</td><td rowspan="2">10,000</td></tr>
<tr><td>40-S32-04-6T</td><td>●</td><td>6</td><td>0.9</td></tr>
<tr><td rowspan="6">Standard (Weldon)</td><td rowspan="6">MFH</td><td>25-W25-04-2T</td><td>●</td><td>2</td><td rowspan="2">25</td><td rowspan="2">14</td><td rowspan="2">25</td><td rowspan="2">60</td><td rowspan="2">117</td><td rowspan="6">2.5</td><td rowspan="6">-10°</td><td rowspan="6">Yes</td><td rowspan="4">Fig.3</td><td>0.4</td><td rowspan="2">12,700</td></tr>
<tr><td>25-W25-04-3T</td><td>●</td><td>3</td><td>0.4</td></tr>
<tr><td>32-W32-04-4T</td><td>●</td><td>4</td><td rowspan="2">32</td><td rowspan="2">21</td><td rowspan="4">32</td><td rowspan="2">70</td><td rowspan="2">131</td><td>0.7</td><td rowspan="2">11,200</td></tr>
<tr><td>32-W32-04-5T</td><td>●</td><td rowspan="2">5</td><td>0.7</td></tr>
<tr><td>40-W32-04-5T</td><td>●</td><td rowspan="2">40</td><td rowspan="2">29</td><td rowspan="2">50</td><td rowspan="2">111</td><td rowspan="2">Fig.4</td><td>0.7</td><td rowspan="2">10,000</td></tr>
<tr><td>40-W32-04-6T</td><td>●</td><td>6</td><td>0.7</td></tr>
<tr><td rowspan="6">Long Shank (Straight)</td><td rowspan="6">MFH</td><td>25-S25-04-2T-180</td><td>●</td><td>2</td><td rowspan="2">25</td><td rowspan="2">14</td><td rowspan="3">25</td><td rowspan="2">100</td><td rowspan="2">180</td><td rowspan="6">2.5</td><td rowspan="6">-10°</td><td rowspan="6">Yes</td><td rowspan="2">Fig.5</td><td>0.6</td><td rowspan="2">12,700</td></tr>
<tr><td>25-S25-04-3T-180</td><td>●</td><td rowspan="2">3</td><td>0.6</td></tr>
<tr><td>28-S25-04-3T-200</td><td>●</td><td>28</td><td>17</td><td>40</td><td rowspan="3">200</td><td>Fig.6</td><td>0.7</td><td>12,000</td></tr>
<tr><td>32-S32-04-4T-200</td><td>●</td><td rowspan="2">4</td><td>32</td><td>21</td><td rowspan="3">32</td><td>120</td><td>Fig.5</td><td>1.1</td><td>11,200</td></tr>
<tr><td>35-S32-04-4T-200</td><td>●</td><td>35</td><td>24</td><td rowspan="2">50</td><td rowspan="2">Fig.6</td><td>1.1</td><td>10,700</td></tr>
<tr><td>40-S32-04-5T-250</td><td>●</td><td>5</td><td>40</td><td>29</td><td>250</td><td>1.5</td><td>10,000</td></tr>
</table>

Caution with max. revolution

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

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

● : Available



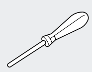
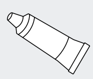
Toolholder dimensions

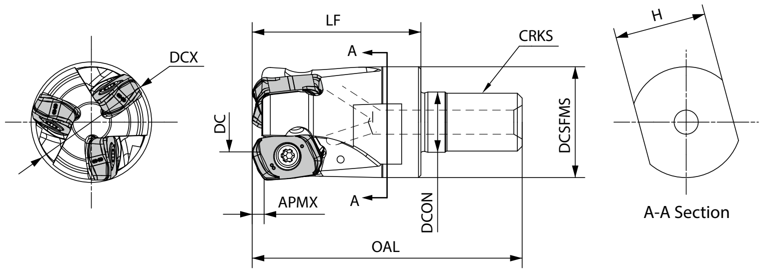
Bore dia.	Description		Availability	No. of inserts	Dimensions (mm)											Rake angle	Coolant hole	Weight (kg)	Max. revolution (min^{-1})
					DCX	DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX	A.R.			
Inch Spec	MFH	080R-04-8T	●	8	80	69	76	31.75	26	17	63	32	8.0	12.7	2.5	-10°	Yes	1.6	7,100
		080R-04-10T	●	10														1.6	
Metric Spec	MFH	040R-04-5T-M	●	5	40	29	38	16	15	9	40	19	5.6	8.4	2.5	-10°	Yes	0.2	10,000
		040R-04-6T-M	●	6														0.2	
		050R-04-6T-M	●		50	39	47	22	18	11	50	21	6.3	10.4				0.4	9,000
		050R-04-7T-M	●	7														0.4	
		052R-04-6T-M	●	6	52	41												0.5	8,800
		052R-04-7T-M	●	7														0.4	
		063R-04-7T-M	●		63	52	60											0.8	8,000
		063R-04-9T-M	●	9														0.8	
		063R-04-7T-27M	●	7				27	20	13		24	7.0	12.4				0.8	
		063R-04-9T-27M	●	9														0.7	
		080R-04-8T-M	●	8	80	69	76				63							1.8	7,100
		080R-04-10T-M	●	10														1.7	

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

● : Available

Parts

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



Toolholder dimensions

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

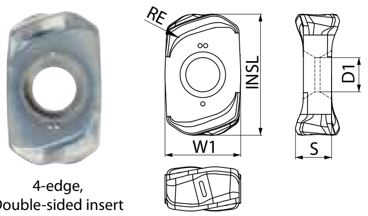
Caution with max. revolution

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

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

● : Available

Applicable inserts

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

● : Available

Insert grade:

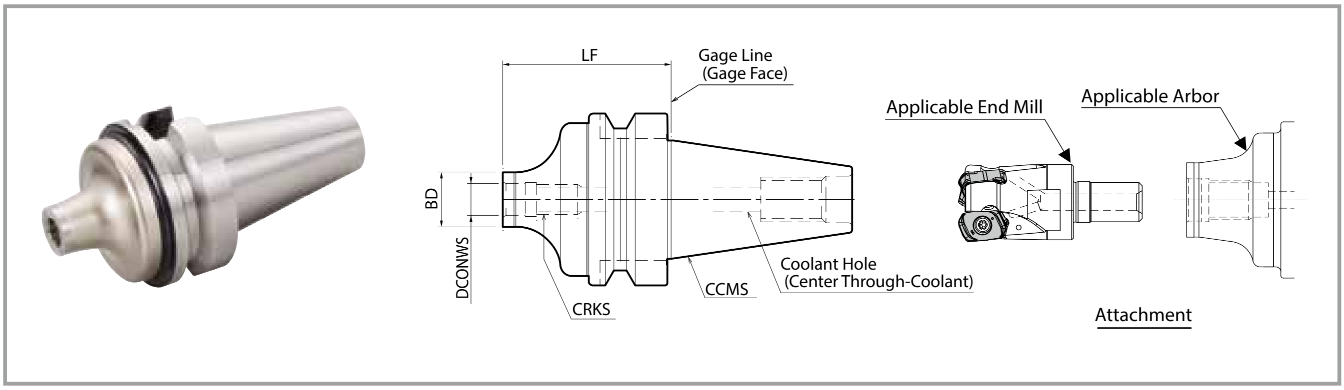
PR1535 For steel machining (Stable machining oriented), titanium alloy, austenitic/precipitation hardening stainless steel, etc.

PR1525 For steel machining (General use)

PR1510 For cast iron machining

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

BT Arbor (for exchangeable head/two face contact)

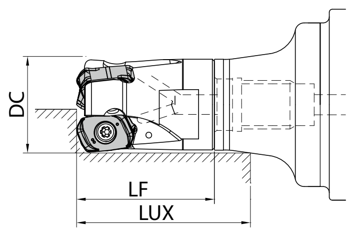


Dimension

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

● : Available

Actual end mill depth



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

MFH Series Large lineup for various applications and machining environments

Small diameter/
Large depth of cut

MFH Boost
ø22 ~ ø80

Micro diameter

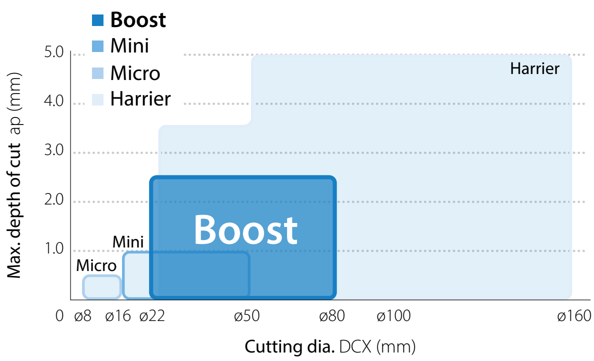
MFH Micro
ø8 ~ ø16

Small diameter/
Fine pitch type

MFH Mini
ø16 ~ ø50

Large diameter

MFH Harrier
ø25 ~ ø160



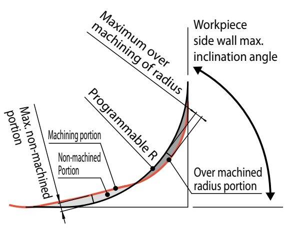
Recommended cutting conditions ★ 1st recommendation ☆ 2nd recommendation

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

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

Precautions

Approximate programming radius adjustment

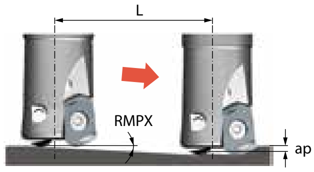
Shape	Programmable R (mm)	Over machined radius portion (mm)	Non-machined portion (mm)
	1.5	0	1.42
	2.0	0	1.24
	3.0 (Recommended)	0	0.87
	3.5	0.06	0.69

Ramping tips

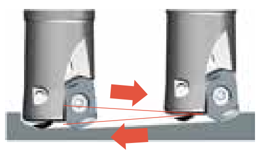
- Ramping angle should be under RMPX
- Reduce recommended feed rate in cutting conditions above by 70%

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

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



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



Ramping reference table

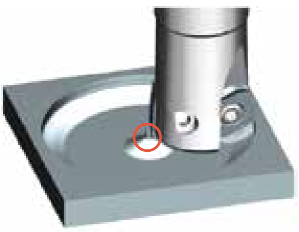
Description	Cutter dia. DCX (mm)	22	25	28	32	35	40	42	50	52	63	80
MFH… -04- …	Max. ramping angle RMPX	3.9°	3.0°	2.4°	2.0°	1.7°	1.4°	1.3°	1.0°	1.0°	0.8°	0.6°
	tan RMPX	0.068	0.052	0.042	0.035	0.029	0.024	0.022	0.018	0.017	0.013	0.010

Helical milling tips

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

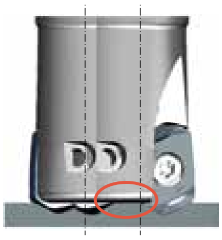
Exceeding max. machining dia.

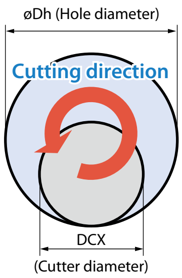
Center core remains after machining



Under min. machining dia.

Center core hits holder body

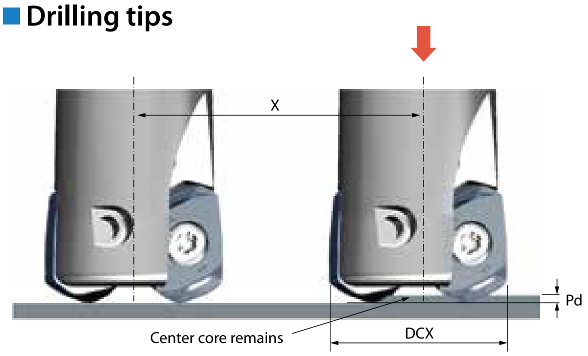




Description	Min. cutting dia. (mm)	Max. cutting dia. (mm)
MFH… -04- …	2×DCX-11	2×DCX-2

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

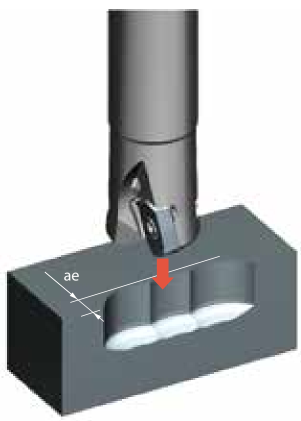
Drilling tips



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

- It is recommended to reduce feed by 25% of recommendation until the center core is removed
- Axial feed rate recommendation per revolution is f ≤ 0.2mm/rev

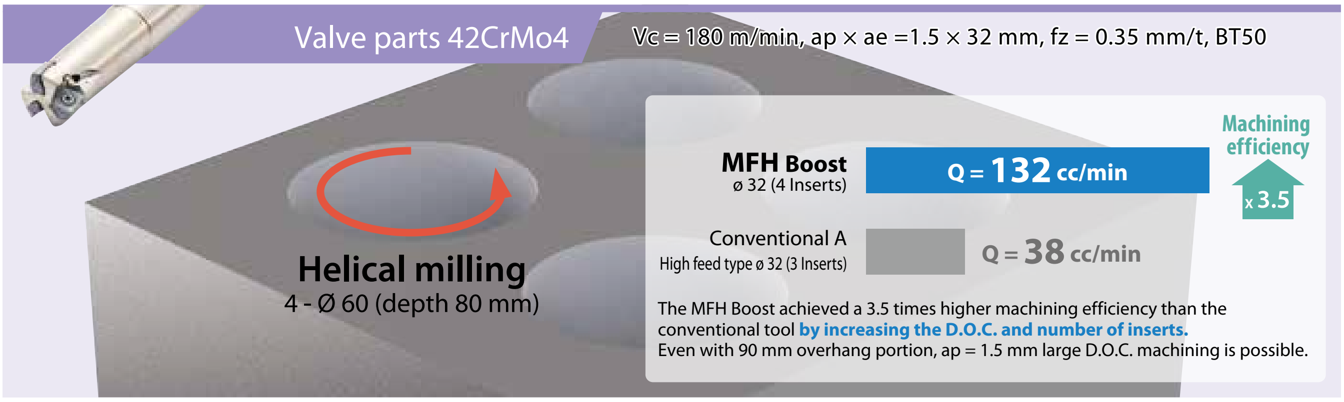
Plunging



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

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

Fast, strong, and efficient

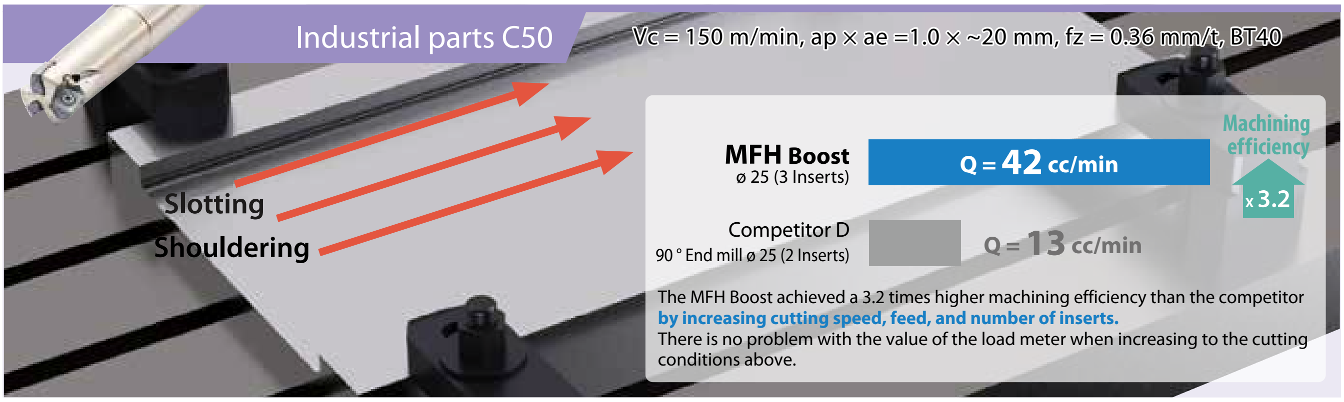


Valve parts 42CrMo4

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

MFH Boost ø 32 (4 Inserts)	Q = **132** cc/min	Machining efficiency x 3.5
Conventional A High feed type ø 32 (3 Inserts)	Q = **38** cc/min	

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

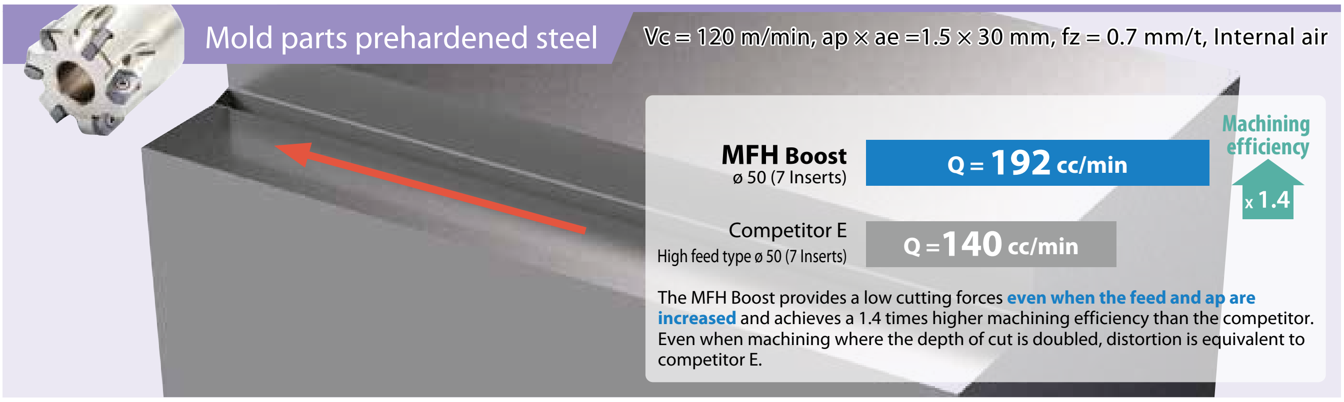


Industrial parts C50

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

MFH Boost ø 25 (3 Inserts)	Q = **42** cc/min	Machining efficiency x 3.2
Competitor D 90 ° End mill ø 25 (2 Inserts)	Q = **13** cc/min	

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



Mold parts prehardened steel

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

MFH Boost ø 50 (7 Inserts)	Q = **192** cc/min	Machining efficiency x 1.4
Competitor E High feed type ø 50 (7 Inserts)	Q = **140** cc/min	

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

(User evaluation)

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