

**MITSUBISHI**

MITSUBISHI CARBIDE

3 flute MSTAR slotting end mill (M)

# **MSMIHZD**

## **Efficient plunging and slotting !**

Significantly reduces slotting time by original cross-section and cutting edge geometry.

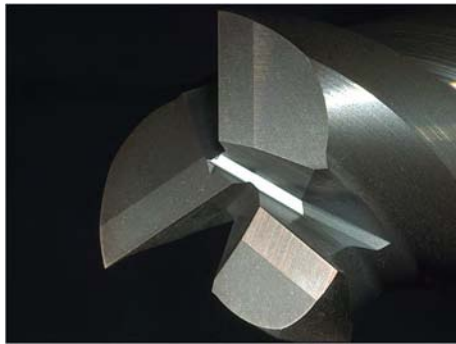


# Mstar End Mill

# MSMHZD

## 3 flute MSTAR slotting end mill (M)

Features ..... **1 Unique three flute design!**



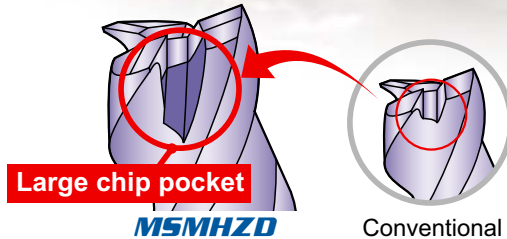
Cutting edges form

Features ..... **2 Generous lineup.**

- Abundant lineup from Dia. 2mm to 20mm.
- Lineup of 24 sizes in total.

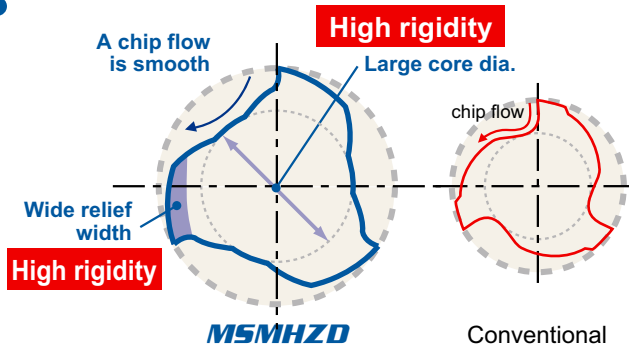
### End cutting edge

Smooth chip discharge due to ample chip pocket for plunging.



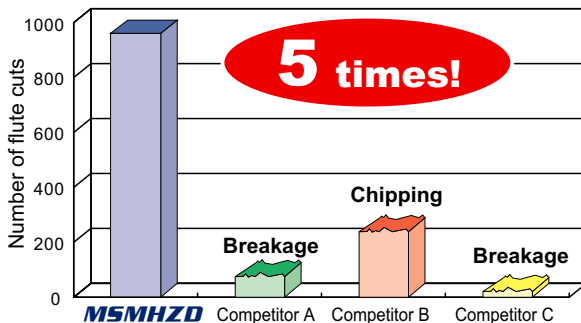
### New slot design

High rigidity and smooth chip discharge is realized.



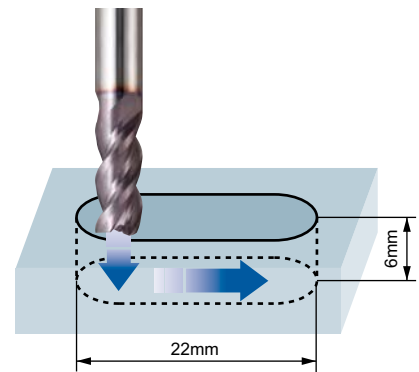
## Machining Example 1

### Slotting



### Cutting conditions

End mill	MSMHZD ø6
Work material	1055
Revolution	4,800min <sup>-1</sup>
Feed rate	Plunging 300mm/min Slotting 720mm/min
Cutting method	Air blow



## Machining Example 2

### Slotting

Great reduction of slotting time!

### MSMHZD

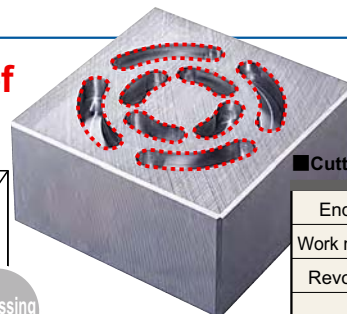
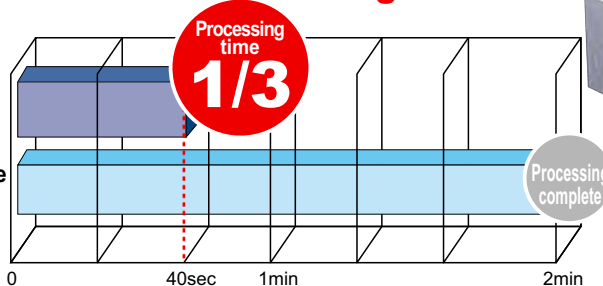
Plunging without step

↓  
Slotting

### Conventional 2 flute

Plunging with step

↓  
Slotting



### Cutting conditions

End mill	MSMHZD ø6
Work material	1055
Revolution	5,000min <sup>-1</sup>
Feed rate	Plunging 300mm/min Slotting 720mm/min
Cutting method	Air blow

**MSMHZD**

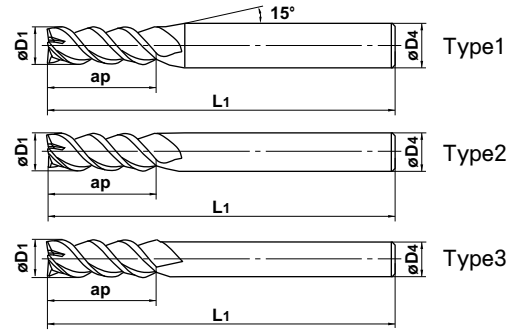
Slotting, Medium, 3 flute



$D_1 \leq 12$  0 - -0.02  
 $12 < D_1$  0 - -0.03



● The single end mill for both plunging and slotting.



Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flute N	Stock	Type
<b>MSMHZDD0200</b>	2	4	50	6	3	●	1
<b>D0250</b>	2.5	5	50	6	3	●	1
<b>D0300</b>	3	6	50	6	3	●	1
<b>D0350</b>	3.5	8	50	6	3	●	1
<b>D0400</b>	4	8	50	6	3	●	1
<b>D0450</b>	4.5	10	50	6	3	●	1
<b>D0500</b>	5	10	50	6	3	●	1
<b>D0550</b>	5.5	13	50	6	3	●	1
<b>D0600</b>	6	13	60	6	3	●	2
<b>D0650</b>	6.5	16	60	8	3	●	1
<b>D0700</b>	7	16	60	8	3	●	1
<b>D0750</b>	7.5	16	60	8	3	●	1
<b>D0800</b>	8	19	70	8	3	●	2
<b>D0850</b>	8.5	19	70	10	3	●	1
<b>D0900</b>	9	19	70	10	3	●	1
<b>D0950</b>	9.5	19	70	10	3	●	1
<b>D1000</b>	10	22	80	10	3	●	2
<b>D1100</b>	11	22	80	12	3	●	1
<b>D1200</b>	12	26	90	12	3	●	2
<b>D1300</b>	13	26	90	12	3	●	3
<b>D1400</b>	14	26	90	12	3	●	3
<b>D1500</b>	15	26	110	16	3	●	1
<b>D1600</b>	16	30	110	16	3	●	2
<b>D2000</b>	20	32	140	20	3	●	2

● : Inventory maintained.

## MSMHZD

Slotting, Medium, 3 flute

### Side milling

Work material	Carbon steel, Alloy steel (-30HRC) AISI 1020, 1055		Hardened steel (30-45HRC) AISI H13		Stainless steel AISI 304, AISI316 Titanium alloy	
	Dia. (mm)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )
2	11,000	600	7,200	310	6,000	210
3	8,500	770	5,300	380	4,400	220
4	7,200	850	4,400	480	3,700	250
6	5,300	940	3,200	490	2,700	270
8	4,000	1,010	2,400	560	2,000	280
10	3,200	1,000	1,900	480	1,600	300
12	2,700	950	1,600	440	1,300	300
16	2,000	720	1,200	350	1,000	260
20	1,600	600	1,000	290	800	240

Depth of cut	$\leq 0.2D$ ( $D > \phi 3$ ) $\leq 0.1D$ ( $D \leq \phi 3$ )		$\leq 0.2D$ ( $D > \phi 3$ ) $\leq 0.1D$ ( $D \leq \phi 3$ )	

D: Dia.

### Slotting

Work material	Carbon steel, Alloy steel (-30HRC) AISI 1020, 1055		Hardened steel (30-45HRC) AISI H13		Stainless steel AISI 304, AISI316 Titanium alloy	
	Dia. (mm)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )
2	11,000	500	7,200	260	6,000	130
3	8,500	640	5,300	320	4,200	130
4	7,200	650	4,400	370	3,300	140
6	5,300	720	3,200	380	2,200	140
8	4,000	780	2,400	430	1,600	140
10	3,200	770	1,900	370	1,300	150
12	2,700	730	1,600	340	1,100	150
16	2,000	600	1,200	290	800	130
20	1,600	500	1,000	240	640	120

Depth of cut	$\leq 1D$		$\leq 0.5D$	

D: Dia.

### Plunging

Work material	Carbon steel, Alloy steel (-30HRC) AISI 1020, 1055		Hardened steel (30-45HRC) AISI H13		Stainless steel AISI 304, AISI316 Titanium alloy	
	Dia. (mm)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )	Feed rate (mm/min)	Revolution (min <sup>-1</sup> )
2	11,000	200	7,200	140	6,000	30
3	8,500	250	5,300	180	4,200	50
4	7,200	300	4,400	210	3,300	60
6	5,300	300	3,200	210	2,200	70
8	4,000	320	2,400	220	1,600	80
10	3,200	340	1,900	240	1,300	70
12	2,700	320	1,600	220	1,100	70
16	2,000	250	1,200	180	800	55
20	1,600	200	1,000	140	640	55

Depth of cut	$\leq 1D$		$\leq 0.5D$	

D: Dia.

- 1) The above table shows for standard milling.
- 2) We recommend the use of coolant e.g. emulsion or water soluble in slotting, plunging and cutting stainless steels.

## MITSUBISHI MATERIALS KOBE TOOLS

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 Detroit Branch Office: 39303 Country Club Drive, Suite A-1, Farmington Hills, Michigan 48331, U.S.A.  
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JQA-2522  
 JQA-EM0941

Mitsubishi Carbides Home page : <http://www.mitsubishicarbide.com>  
 (Tools specifications subject to change without notice.)