MITSUBISHI
MITSUBISHI MATERIALS

TOOLS NEWS

2006.11 Update B072G

3 flute MSTAR slotting end mill (M)

MSMHZD

Expand

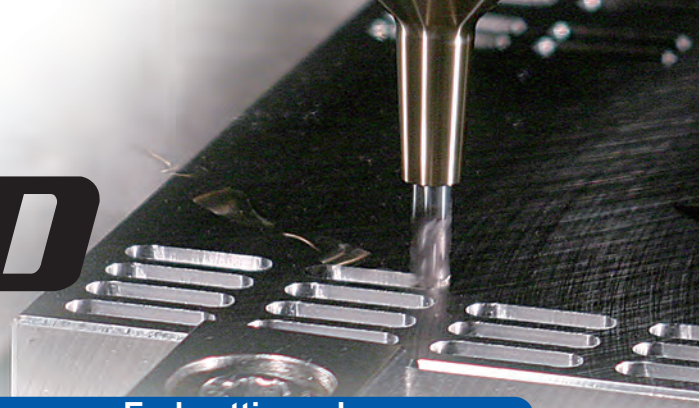
Efficient plunging and slotting !

Great reduction of slotting time
by original cross-section
and cutting edge geometry.

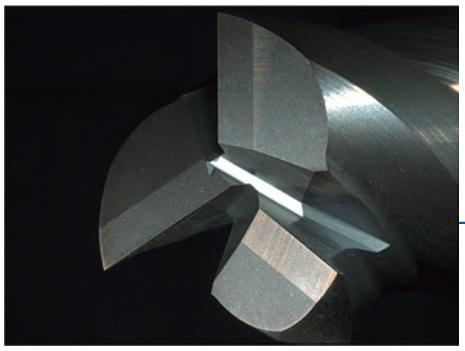
Mstar End Mill

MSMHZD

3 flute MSTAR slotting end mill (M)



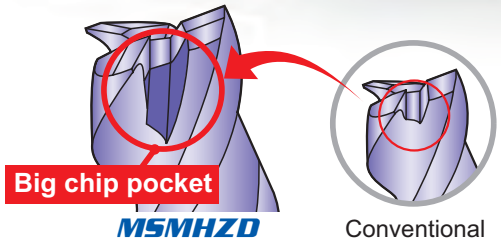
Features 1 **Evolved three flute design!**



Cutting edges form

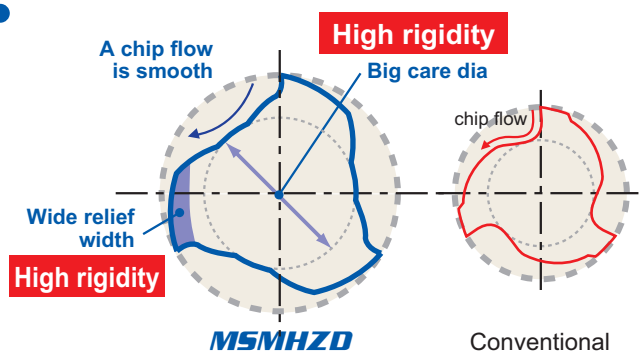
End cutting edge

Smooth chip flow due to big chip pocket at plunging.



New slot design

High rigidity and smooth chip flow is realized.

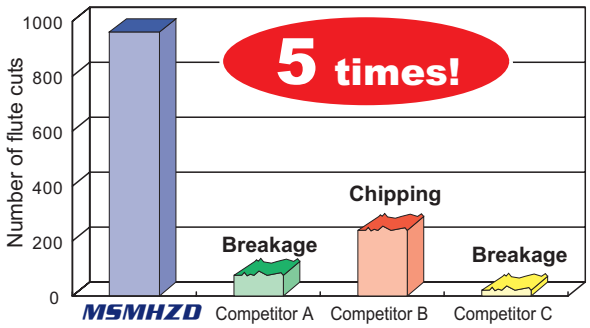


Features 2 **Abundant lineup.**

- Abundant lineup from Dia.1mm to 20mm.
- Lineup of 26 size in total.

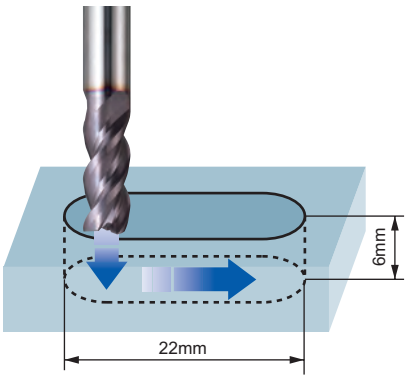
Machining Example 1

Slotting



■Cutting conditions

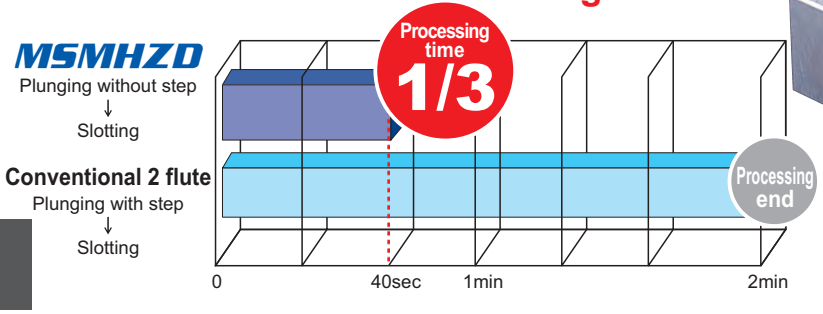
End mill	MSMHZD ø6
Work material	JIS S55C
Revolution	4,800min^{-1}
Feed rate	Plunging 300mm/min Slotting 720mm/min
Cutting method	Air blow

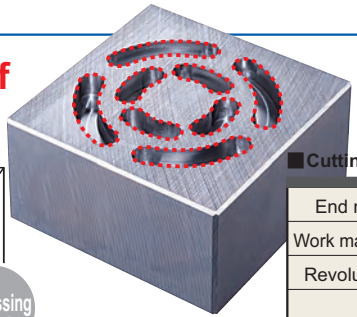


Machining Example 2

Slotting

Great reduction of slotting time!





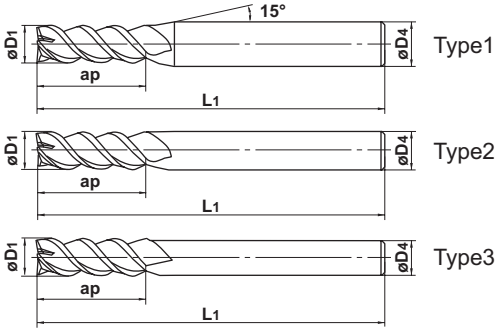
■Cutting conditions

End mill	MSMHZD ø6
Work material	JIS S55C
Revolution	5,000min^{-1}
Feed rate	Plunging 300mm/min Slotting 720mm/min
Cutting method	Air blow

MSMHZD Expand

Slotting, Medium, 3 flute

D1≤12 0 − -0.02
12<D1 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	
* MSMHZDD0100	1	2	45	4	3	●	1	
* D0150	1.5	3	45	4	3	●	1	
D0200	2	4	50	6	3	●	1	
D0250	2.5	5	50	6	3	●	1	
D0300	3	6	50	6	3	●	1	
D0350	3.5	8	50	6	3	●	1	
D0400	4	8	50	6	3	●	1	
D0450	4.5	10	50	6	3	●	1	
D0500	5	10	50	6	3	●	1	
D0550	5.5	13	50	6	3	●	1	
D0600	6	13	60	6	3	●	2	
D0650	6.5	16	60	8	3	●	1	
D0700	7	16	60	8	3	●	1	
D0750	7.5	16	60	8	3	●	1	
D0800	8	19	70	8	3	●	2	
D0850	8.5	19	70	10	3	●	1	
D0900	9	19	70	10	3	●	1	
D0950	9.5	19	70	10	3	●	1	
D1000	10	22	80	10	3	●	2	
D1100	11	22	80	12	3	●	1	
D1200	12	26	90	12	3	●	2	
D1300	13	26	90	12	3	●	3	
D1400	14	26	90	12	3	●	3	
D1500	15	26	110	16	3	●	1	
D1600	16	30	110	16	3	●	2	
D2000	20	32	140	20	3	●	2	

* Expand

● : Inventory maintained.

MSTAR END MILLS

Side milling

Work material	Carbon steel, Alloy steel (−30HRC) AISI 1049, SCM, SS		Hardened steel (30−45HRC) AISI H13		Stainless steel AISI 304, AISI316 Titanium alloy	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	19,000	600	13,000	310	10,000	200
1.5	14,000	600	9,000	310	7,500	210
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	≤0.2D (D>ϕ3) ≤0.1D (D≤ϕ3) ≤1.5D				≤0.2D (D>ϕ3) ≤0.1D (D≤ϕ3) ≤1.5D	

D:Dia.

Slotting

Work material	Carbon steel, Alloy steel (−30HRC) AISI 1049, SCM, SS		Hardened steel (30−45HRC) AISI H13		Stainless steel AISI 304, AISI316 Titanium alloy	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	13,000	130	10,000	80	6,000	30
1.5	12,000	250	8,000	150	6,000	60
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	D ≤1D (D≥ϕ2) ≤0.5D (D<ϕ2)				D ≤0.5D (D≥ϕ2) ≤0.2D (D<ϕ2)	

D:Dia.

Plunging

Work material	Carbon steel, Alloy steel (−30HRC) AISI 1049, SCM, SS		Hardened steel (30−45HRC) AISI H13		Stainless steel AISI 304, AISI316 Titanium alloy	
Dia. (mm)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)	Revolution (min^{-1})	Feed rate (mm/min)
1	13,000	80	10,000	50	6,000	10
1.5	12,000	120	8,000	80	6,000	20
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	≤1D (D≥ϕ2) ≤0.5D (D<ϕ2)				≤0.5D (D≥ϕ2) ≤0.2D (D<ϕ2)	

D:Dia.

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

JQA-2522
JQA-EM0941

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