

# MUGEN

**MUGEN-COATING**

*High Efficiency Radius*

**MHR400RHF**

**MHRL400RHF**



**FISM**

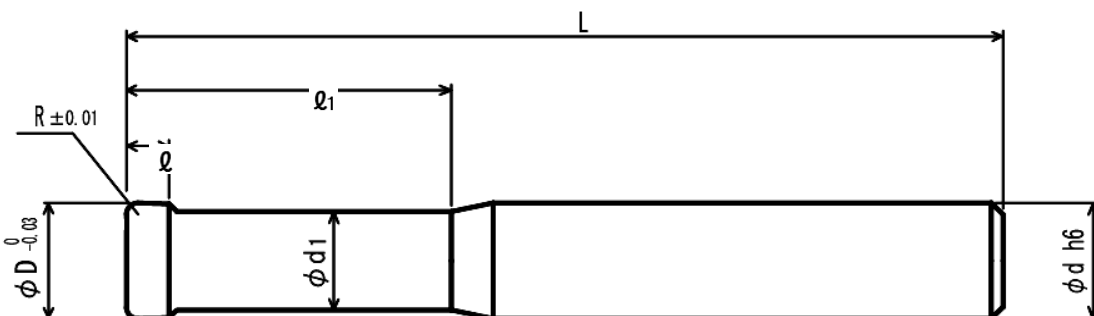
F.I.S.M. - produktivní nástroje s.r.o.  
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## <<< SPECIFICATION >>>

### FEATURES:

High-efficient machining with no chattering is realized by unique flute design.  
Long tool life is guaranteed by used of Mugen-coating.

High-solid flute design achieved super high-speed machining.



Number of Flutes 4  
Coating MUGEN(TiAlN)  
Material Micro Grain Carbide

### LINE-UP:

#### MHR400RHF

Code No.	(D) Dia	(R) Corner Radius	(ℓ) Length of Cut	(ℓ <sub>1</sub> ) Effective Length	(d <sub>1</sub> ) Neck Dia	(d) Shank Dia	(L) Overall Length	Standardní cena	Akční cena
Z04-069S	4	1	2	8	3.7	6	50	<del>2.139,-</del>	1.284,-
Z04-070S	5	1	2.5	10	4.6	6	50	<del>2.208,-</del>	1.325,-
Z04-071S	6	1.5	3	12	5.5	6	55	<del>2.070,-</del>	1.242,-
Z04-072S	8	2	4	16	7.4	8	60	<del>3.450,-</del>	2.070,-
Z04-073S	10	2	5	20	9.2	10	70	<del>4.393,-</del>	2.636,-
Z04-074S	12	2	6	24	11	12	75	<del>5.497,-</del>	3.299,-

Uvedené ceny jsou za kus, bez DPH

#### MHRL400RHF

Code No.	(D) Dia	(R) Corner Radius	(ℓ) Length of Cut	(ℓ <sub>1</sub> ) Effective Length	(d <sub>1</sub> ) Neck Dia	(d) Shank Dia	(L) Overall Length	Standardní cena	Akční cena
Z04-075S	4	1	2	16	3.7	6	60	<del>2.277,-</del>	1.367,-
Z04-076S	5	1	2.5	20	4.6	6	60	<del>2.369,-</del>	1.422,-
Z04-077S	6	1.5	3	24	5.5	6	65	<del>2.208,-</del>	1.325,-
Z04-078S	8	2	4	32	7.4	8	75	<del>3.910,-</del>	2.346,-
Z04-079S	10	2	5	40	9.2	10	90	<del>5.014,-</del>	3.009,-
Z04-080S	12	2	6	48	11	12	100	<del>6.486,-</del>	3.892,-

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# <<< RECOMMENDED CUTTING CONDITION >>>

## MHR400RHF

Work Material	Carbon Steels S50C			Prehardened HPM/NAK			Hardened Steels SKD61(~52HRC)		
Cutting Speed	200 m/min			200 m/min			150 m/min		
Dia.	Spindle Speed	Feed	Depth of Cut	Spindle Speed	Feed	Depth of Cut	Spindle Speed	Feed	Depth of Cut
	min <sup>-1</sup>	mm/min	Ad × Rd mm	min <sup>-1</sup>	mm/min	Ad × Rd mm	min <sup>-1</sup>	mm/min	Ad × Rd mm
φ 4	16,000	13,000	0.1 × 1.2	16,000	12,000	0.1 × 1.2	12,000	8,200	0.1 × 1.2
φ 5	12,000	14,000	0.12 × 1.5	12,000	11,000	0.12 × 1.5	9,500	8,600	0.12 × 1.5
φ 6	10,600	14,000	0.15 × 1.8	10,600	12,700	0.15 × 1.8	7,900	8,600	0.15 × 1.8
φ 8	7,900	14,000	0.2 × 2.4	7,900	12,700	0.2 × 2.4	5,900	8,600	0.2 × 2.4
φ 10	6,300	14,000	0.25 × 3.0	6,300	12,700	0.25 × 3.0	4,700	8,600	0.2 × 3.0
φ 12	5,300	11,600	0.3 × 3.6	5,300	10,600	0.3 × 3.6	4,000	7,200	0.2 × 3.6

※ Tool extension length : 4 × D

## MHRL400RHF

Work Material	Carbon Steels S50C			Prehardened HPM/NAK			Hardened Steels SKD61(~52HRC)		
Cutting Speed	160 m/min			160 m/min			120 m/min		
Dia.	Spindle Speed	Feed	Depth of Cut	Spindle Speed	Feed	Depth of Cut	Spindle Speed	Feed	Depth of Cut
	min <sup>-1</sup>	mm/min	Ad × Rd mm	min <sup>-1</sup>	mm/min	Ad × Rd mm	min <sup>-1</sup>	mm/min	Ad × Rd mm
φ 4	12,800	10,400	0.08 × 1.2	12,800	9,600	0.08 × 1.2	9,600	6,560	0.08 × 1.2
φ 5	9,600	11,200	0.1 × 1.5	9,600	8,800	0.1 × 1.5	7,600	6,880	0.08 × 1.5
φ 6	8,480	11,200	0.1 × 1.8	8,480	10,160	0.1 × 1.8	6,320	6,880	0.1 × 1.8
φ 8	6,320	11,200	0.15 × 2.4	6,320	10,160	0.15 × 2.4	4,720	6,880	0.12 × 2.4
φ 10	5,040	11,200	0.17 × 3.0	5,040	10,160	0.17 × 3.0	3,760	6,880	0.15 × 3.0
φ 12	4,240	9,280	0.2 × 3.6	4,240	8,480	0.2 × 3.6	3,200	5,760	0.15 × 3.6

※ Tool extension length : 6D(φ 4~φ 6)  
: 5D(φ 8~φ 12)

- ※ Adjust the milling conditions according to rigidity of the machine.
- ※ Reduce spindle speed when chattering.
- ※ Apply to corner milling by contouring.
- ※ Adjust both spindle speed and feed in the same proportion.
- ※ Air blow or oil mist is recommended.



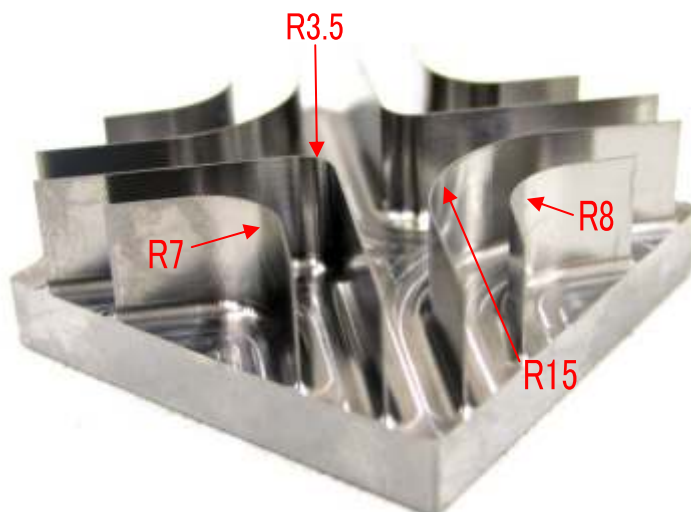
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# <<< CUTTING DATA >>>

Tool	MHR400RHF φ 6 × R1.5 × 12	
Work Material	NAK80 (40HRC)	
Spindle Speed (min <sup>-1</sup> )	10,600	
Feed (mm/min)	Roughing	8,000
	Finishing	4,000
Depth of Cut Ad × Rd (mm)	Roughing	0.15 × 1.8
	Finishing	0.15 × 0.02
Coolant	Oil mist	
Cutting Time	1 hour 10min	

0.2mm thickness × 12mm height  
 Perpendicularity : 3 μm  
 Deviation of thickness : 3 μm

Tool wear  
 after machining  
 3 workpieces. →



Tool	MHRL400RHF φ 6 × R1.5 × 24	
Work Material	NAK80 (40HRC)	
Spindle Speed (min <sup>-1</sup> )	10,600	
Feed (mm/min)	Roughing	6,500
	Finishing	2,000
Depth of Cut Ad × Rd (mm)	Roughing	0.05 × 1.8
	Finishing	0.05 × 0.02
Coolant	Oil mist	
Cutting Time	9 hours	

0.2mm thickness × 24mm height  
 Perpendicularity : 4~5 μm  
 Deviation of thickness : 3 μm

Tool wear  
 after machining  
 1 workpiece. →

