



Size $\phi 1 \sim \phi 12$

HMS

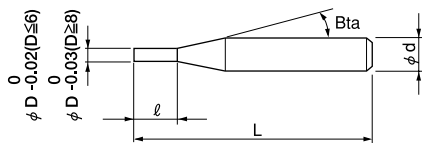


Material Applications (☆ Highly Recommended ○ Recommended ○ Suggested)

Work Material															
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels			Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
S45C S55C	SK / SCM SUS	NAK HPM	~55HRC	~60HRC	~70HRC										
		○	○	○	○										
					○ ~65HRC										

Features

Outstanding heat resistance and low friction properties during hard milling up to 65HRC. Achieves market leading longer tool life.



The shank taper angle shown is not an exact value and to avoid contact with the work piece, we recommend the user controls the precise value of this angle. Shank taper angle should not make contact with the work piece.

Total 27 models

Unit (mm)

Model Number	Outside Diameter ϕD	Length of Cut l	Shank Taper Angle B_{ta}	Overall Length L	Shank Diameter ϕd	Number of Flutes	Price (¥)
HMS 3010-0250	1	2.5	16°	45	4	3	7,500
HMS 3010-0350		3.5		45			10,800
HMS 3015-0400	1.5	4	16°	45	4	3	7,500
HMS 3015-0600		6		45			10,800
HMS 3020-0400	2	4	16°	45	4	3	6,700
HMS 3020-0700		7		45			10,000
HMS 3030-0600	3	6	16°	50	6	3	9,240
HMS 3030-1000		10		60			9,800
HMS 3030-1500		15		60			10,920
HMS 4040-0800	4	8	16°	50	6	4	9,870
HMS 4040-1200		12		60			10,470
HMS 4040-2000		20		70			11,450
HMS 4050-1000	5	10	16°	50	6	4	10,500
HMS 4050-1500		15		60			11,100
HMS 4050-2500		25		70			12,180
HMS 6060-1300	6	13	—	50	6	6	11,340
HMS 6060-1800		18		60			12,100
HMS 6060-2600		26		70			13,230
HMS 6080-1900	8	19	—	60	8	6	14,630
HMS 6080-2400		24		70			15,000
HMS 6080-3600		36		90			17,160
HMS 6100-2200	10	22	—	70	10	6	18,360
HMS 6100-3000		30		80			20,000
HMS 6100-4600		46		100			22,990
HMS 6120-2600	12	26	—	75	12	6	24,750
HMS 6120-3600		36		100			25,400
HMS 6120-5600		56		120			28,600

Milling Conditions for HMS

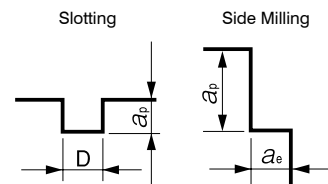
◆ Short length of cut

WORK MATERIAL			PREHARDENED STEELS HARDENED STEELS (40~50HRC)		HARDENED STEELS (50~60HRC)		HARDENED STEELS (60~65HRC)	
Velocity			Vc=30m/min		Vc=20m/min		Vc=20m/min	
Model Number	Number of Flute	Outside Diameter (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
3010-0250	3	1	9,500	140	6,400	95	6,400	90
3015-0400		1.5	6,400	100	4,200	60	4,200	60
3020-0400		2	4,700	80	3,200	75	3,200	70
3030-0600		3	3,200	85	2,100	80	2,100	80
4040-0800	4	4	2,400	90	1,600	85	1,600	80
4050-1000		5	1,900	90	1,300	85	1,300	80
6060-1300	6	6	1,600	170	1,100	120	1,100	110
6080-1900		8	1,200	170	800	120	800	110
6100-2200		10	950	170	640	100	640	80
6120-2600		12	800	170	530	90	530	70
		Milling Amount (mm)		Slotting		$a_p \leq 0.05D$ (max0.5mm)		
		Side Milling		$D \leq \phi 8$ $a_p = 1D$ $D \geq \phi 10$ $a_p = 1.5D$ $a_e \leq 0.05D$ (max0.5mm)				

◆ High speed milling for short length of cut

WORK MATERIAL			PREHARDENED STEELS HARDENED STEELS (40~50HRC)		HARDENED STEELS (50~60HRC)		HARDENED STEELS (60~65HRC)	
Velocity			Vc=70~219m/min		Vc=62~200m/min		Vc=47~147m/min	
Model Number	Number of Flute	Outside Diameter (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
3010-0250	3	1	22,500	630	20,000	540	15,000	450
3015-0400		1.5	18,000	720	16,000	630	11,500	540
3020-0400		2	14,300	850	13,000	750	8,500	630
3030-0600		3	13,100	1,120	11,200	950	6,700	760
4040-0800	4	4	11,300	1,300	9,900	1,170	5,700	850
4050-1000		5	10,100	1,530	8,900	1,350	4,800	950
6060-1300	6	6	8,900	1,950	8,000	1,800	4,250	1,120
6080-1900		8	7,700	2,350	6,900	2,200	4,150	1,220
6100-2200		10	6,700	3,100	6,000	2,700	4,000	1,350
6120-2600		12	5,800	3,000	5,300	2,500	3,900	1,450
		Milling Amount (mm)		Side Milling		$a_p = 1.5D$ $a_e = 0.03D$ (max0.5mm)		$D \leq \phi 5$ $a_p = 0.5D$ $D \geq \phi 6$ $a_p = 1.5D$ $a_e = 0.01D$

D : Outside Diameter (mm)
 a_p : Axial Depth (mm)
 a_e : Radial Depth (mm)



Square

Radius

Ball / Long Shank Ball

Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Milling Conditions for HMS

◆Medium length of cut

WORK MATERIAL			PREHARDENED STEELS HARDENED STEELS (40~50HRC)		HARDENED STEELS (50~60HRC)		HARDENED STEELS (60~65HRC)	
Velocity			Vc=30m/min		Vc=20m/min		Vc=20m/min	
Model Number	Number of Flute	Outside Diameter (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
3030-1000	3	3	3,200	43~85	2,100	40~80	2,100	40~80
4040-1200		4	2,400	45~90	1,600	43~85	1,600	40~80
4050-1500	4	5	1,900	45~90	1,300	43~85	1,300	40~80
6060-1800		6	1,600	85~170	1,100	60~120	1,100	55~110
6080-2400	6	8	1,200	85~170	800	60~120	800	55~110
6100-3000		10	950	85~170	640	50~100	640	40~80
6120-3600		12	800	85~170	530	45~90	530	35~70
		Slotting		$a_p \leq 0.03D$ (max 0.3mm)				
Milling Amount (mm)		Side Milling	$D \leq \phi 8$ $a_p = 2D$ $D \geq \phi 10$ $a_p = 2.5D$ $a_e \leq 0.03D$ (max 0.3mm)					

◆Long length of cut

WORK MATERIAL			PREHARDENED STEELS HARDENED STEELS (40~50HRC)		HARDENED STEELS (50~60HRC)		HARDENED STEELS (60~65HRC)	
Velocity			Vc=30m/min		Vc=20m/min		Vc=20m/min	
Model Number	Number of Flute	Outside Diameter (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)
3010-0350	3	1	9,500	140~210	6,400	95~143	6,400	95~133
3015-0600		1.5	6,300	100~150	4,200	80~120	4,200	80~112
3020-0700		2	4,700	80~120	3,200	75~113	3,200	75~113
3030-1500		3	3,200	85~128	2,100	80~120	2,100	80~120
4040-2000	4	4	2,400	90~135	1,600	85~128	1,600	83~125
4050-2500		5	1,900	90~135	1,300	85~128	1,300	83~125
6060-2600	6	6	1,600	170~255	1,100	120~180	1,100	112~168
6080-3600		8	1,200	170~255	800	120~180	800	110~166
6100-4600		10	950	170~255	640	100~150	640	88~132
6120-5600		12	800	170~255	530	90~135	530	76~114
Milling Amount (mm)		Side Milling	$a_p = 3D$ $a_e \leq 0.02D$					

D : Outside Diameter (mm)
 a_p : Axial Depth (mm)
 a_e : Radial Depth (mm)

Note:

- Recommend down cut processing.
- Reduce cutting amount, feed rate, and apply zero-cut in accordance with required surface quality.
- Recommend air blow or oil mist.

