

4 Flutes HARDMAX



Size $\phi 2 \sim \phi 12$

Short Shank Series

HRRS-S

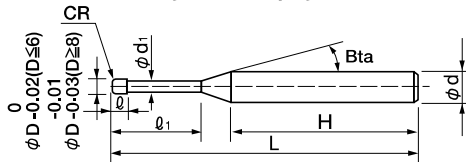


Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

Work Material																	
Carbon Steels S45C S55C	Alloy Steels SK / SCM SUS	Prehardened Steels NAK HPM	Hardened Steels					Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
			~50HRC	~55HRC	~60HRC	~65HRC	~70HRC										
		●	●	●	●	○	○										

Features

Shorter overall length and overhang offer higher feed and precision.
 Achieves larger step over by seamless corner radius design.
 Rated to 65HRC milling. Refer to page 384, 385 for milling conditions.



The shank taper angle and the shank length (H) shown are 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 26 models

Unit (mm)




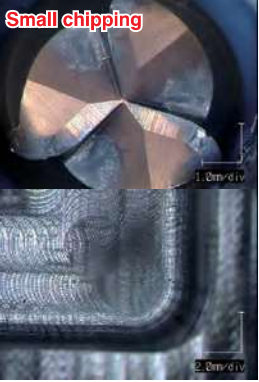
Model Number	Outside Diameter ϕD	Corner Radius CR	Effective Length ℓ_1	Length of Cut ℓ	Neck Diameter ϕd_1	Shank Taper Angle Bta	Overall Length L	Shank Diameter ϕd	Shank Length H	Suggested Retail Price ¥
HRRS 4020-03-06S	2	R0.3	6	2	1.91	16°	45	4	33.0	9,450
HRRS 4020-05-06S		R0.5								
HRRS 4030-08-09-3S	3	R0.8	9	3	2.92	—	50	3	38.5	8,820
HRRS 4030-08-09S										
HRRS 4040-05-12S	4	R0.5	12	4	3.82	—	50	4	35.0	9,000
HRRS 4040-05-12-6S										
HRRS 4040-10-12S		R1				—	50	4	35.0	9,000
HRRS 4040-10-12-6S										
HRRS 4050-12-15S	5	R1.2	15	5	4.82	16°	50	6	30.0	10,800
HRRS 4060-05-18S	6	R0.5	18	6	5.82	—	50	6	29.0	12,060
HRRS 4060-10-18S		R1								
HRRS 4060-15-18S		R1.5								
HRRS 4060-20-18S		R2								
HRRS 4080-05-24S	8	R0.5	24	8	7.82	—	60	8	33.0	15,030
HRRS 4080-10-24S		R1								
HRRS 4080-20-24S		R2								
HRRS 4080-30-24S		R3								
HRRS 4100-03-30S	10	R0.3	30	10	9.82	—	65	10	31.5	19,800
HRRS 4100-05-30S		R0.5								
HRRS 4100-10-30S		R1								
HRRS 4100-20-30S		R2								
HRRS 4100-30-30S		R3								
HRRS 4120-05-36S	12	R0.5	36	12	11.82	—	75	12	35.5	24,930
HRRS 4120-10-36S		R1								
HRRS 4120-20-36S		R2								
HRRS 4120-40-36S		R4								

- φ3mm Shank V Series
- UDC-PCD Series
- CBN Series
- Square
- Long Neck Square
- Radius
- Long Neck Radius
- Taper Neck Radius
- Ball / Long Shank Ball
- Long Neck Ball
- Taper Neck Ball
- Taper
- Barrel
- Spiral V Cutter
- Drill
- Technical Data

Pocket Milling Example: Milling with HRRS $\phi 6 \times CR1.5$

NAK80 (40HRC)

4 Flutes

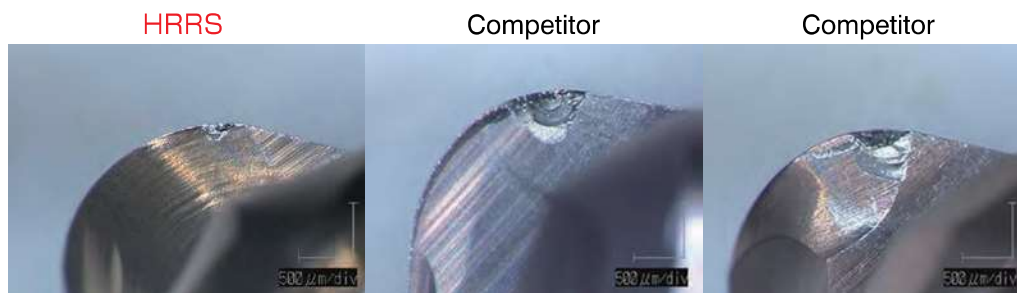
HRRS	Competitor A: 4 Flutes	Competitor B: 4 Flutes	Competitor B: 3 Flutes
 <p>Minute chipping</p> <p>Smooth surface finish</p>	 <p>Broken</p> <p>Broken after 3 mins</p>	 <p>Chipping</p>	 <p>Small chipping</p>
CR1.5, FL6 mm, EFL18 mm	CR1.5, FL6 mm, EFL18 mm	CR1.5, FL12 mm	CR1.5, FL12 mm

Spindle Speed	Feed Rate	a_p	a_e	Overhang Length	Cycle Time	Pocket Size
9,000 min ⁻¹	11,000 mm/min	0.3 mm (0.05D)	3 mm (0.5D)	20 mm	20 min	40 × 180 × Depth 15 mm

Excellent chipping resistance and surface quality !

Original corner radius design offers high rigidity and reduces cutting resistance.

After milling SKD11 (60HRC)



Seamless corner radius with equal rake angle design. Reduces the cutting resistance and offers excellent chip evacuation to protect from the tool damage.

Flat and non-helix gash design. Badly damaged at tip point where cutting chips are trapped by poor chip evacuation.

Flat and helical gash design. Huge tool damage at tangent point where the gash shape abruptly changed and cutting chips could not evacuate properly.

Spindle Speed	Feed Rate	a_p	a_e	Overhang Length	Pocket Size
2,700 min ⁻¹	2,000 mm/min	0.3 mm	1.5 mm	20 mm	40 × 40 × 0.3 mm

Longer tool life with variable pitch design. Recommended for various coolant.

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