

2 Flutes HARDMAX



Size R0.1~R2

Short Shank Series

HSB-S



Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

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	~50HRC	~55HRC	~60HRC	~65HRC	~70HRC										
○	○	○	●	●	●	●	○		○			○			○	○		

Features

Short Shank Ball End Mills for high accuracy shrink-fit tool holder.
 Offers high efficiency, long tool life and excellent surface finish on hard materials over 40HRC.
 HARDMAX coat offers heat resistance, durability and lubricity at a high level.
 Every coolant offers stable milling.
 Ball tip point is designed with a negative rake angle that minimizes wear and improves the target dimensions.
 The low negative rake angle at the peripheral side of the ball offers an excellent surface finish and prevents deflection.

Better Tolerance Design! Diameter Tolerance, Ball Radius Accuracy, and Shank Diameter Tolerance

HSB / HSLB Tolerance

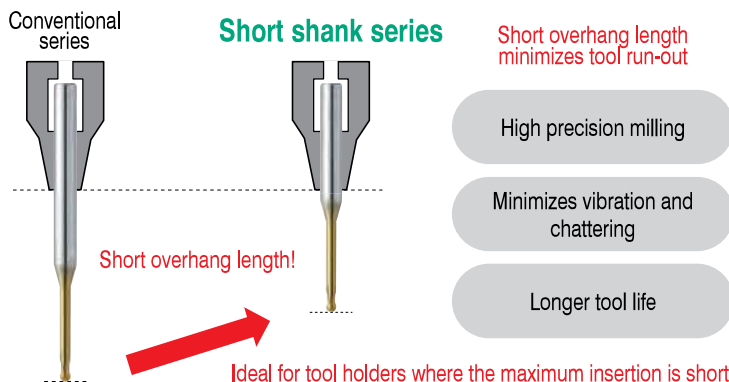
Radius of Ball Nose	Diameter Tolerance	Ball Radius Accuracy	Shank Diameter Tolerance
R0.1 ~ R3	0/-0.015	±0.005	0/-0.005 (h5)

HSB-S / HSLB-S Tolerance

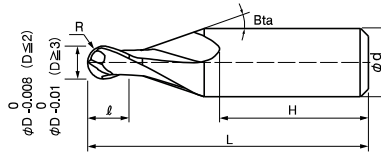
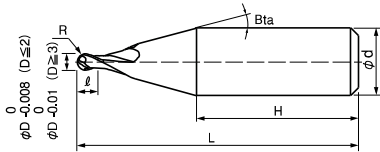
Radius of Ball Nose	Diameter Tolerance	Ball Radius Accuracy	Shank Diameter Tolerance
R0.1 ~ R1	0/-0.008	±0.003	0/-0.004 (h4)
R1.5 ~ R2	0/-0.01		
R3		±0.005	

Shank diameter tolerance h4!

Short overhang length with short shank length!



- 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



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 10 models

Unit (mm)

Model Number	Radius of Ball Nose R	Length of Cut l	Shank Taper Angle $B\alpha$	Overall Length L	Shank Diameter ϕd	Shank Length H	Suggested Retail Price ¥
HSB 2002-0020S	RO.1	0.2	16°	35	4	26.0	8,520
HSB 2003-0030S	RO.15	0.3	16°	35	4	26.0	6,960
HSB 2004-0040S	RO.2	0.4	16°	35	4	26.0	4,680
HSB 2006-0060S	RO.3	0.6	16°	35	4	26.0	4,200
HSB 2008-0080S	RO.4	0.8	16°	35	4	26.5	4,200
HSB 2010-0100S	RO.5	1	16°	35	4	26.5	3,840
HSB 2015-0150S	RO.75	1.5	16°	35	4	26.5	4,680
HSB 2020-0200S	R1	2	16°	35	4	25.5	3,480
HSB 2030-0300S	R1.5	3	16°	40	6	27.0	4,200
HSB 2040-0400S	R2	4	16°	40	6	26.0	4,800

Press Die

DC53 (60HRC)



Work Size 100 × 120 × 50 mm
Coolant Oil Mist

Tool used mainly

HSB
HSLB



Milling Process	Tool	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p (mm)	a_e (mm)	Cycle Time (h:m:s)	Milling Distance (m)	
Roughing	HSB 2 Flute Ball R4	5,200	2,200	0.4	1.7	2:52:35	334	
Roughing	R3 × EL30	6,500	2,500	0.2	0.65	0:28:01	46	
Semi-finishing	HSLB 2 Flute Long Neck Ball	R2 × EL25	8,000	1,160	0.7 (Ridgeline)	0.35 (Orthogonal)	0:21:38	18
Semi-finishing		R3 × EL30	6,500	2,500	0	0.3	0:21:38	48
Finishing		R3 × EL30	6,500	2,500	0	0.01	2:53:09	274
Finishing	HLRS 4 Flute Long Neck Radius $\phi 6 \times EL30 \times CR1$	2,200	580	0.1	1	1:03:01	23	
Drilling	HSB 2 Flute Ball R0.3	30,000	1,200	0.05	0	0:02:09	1.6	

8:02:11 748

ϕ3mm Shank V Series

UDC-PCD Series

CBN Series

Square
Long Neck Square

Radius

Radius
Long Neck Radius
Taper Neck Radius

Ball / Long Shank Ball

Ball
Long Neck Ball
Taper Neck Ball

Taper

Barrel

Spiral V Cutter

Drill

Technical Data