

4 Flutes HMGCOAT For Hard Materials



Size $\phi 0.2 \sim \phi 6$

HGLRS

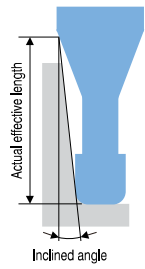
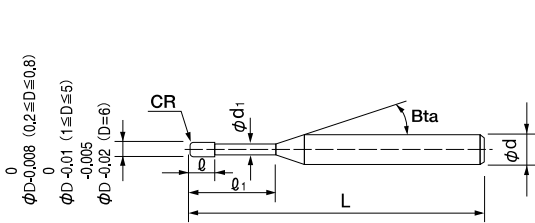
Super MG HMG COAT 30° R ± 0.003 Shank Dia 0/-0.004 Back Taper Geometry Variable Pitch

NEW

Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

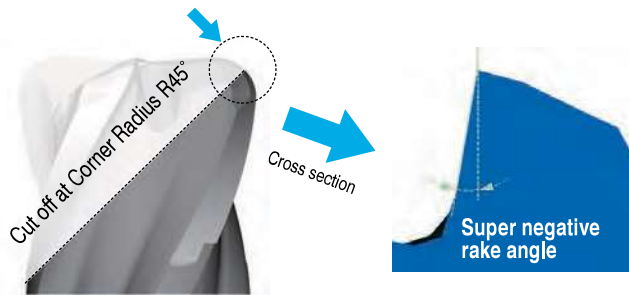
		Work Material															
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels					Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
			~50HRC	~55HRC	~60HRC	~65HRC	~70HRC		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

- 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
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- Taper
- Barrel
- Spiral V Cutter
- Drill
- Technical Data



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.

◆ **Super negative rake angle is best suited for 60-70 HRC as it greatly reduces the cutting resistance.**



◆ **High Precision Diameter Tolerance / Radius Accuracy / Shank Diameter Tolerance**

HLRS Tolerance				HGLRS Tolerance			
Unit (mm)				Unit (mm)			
Outside Diameter	Diameter Tolerance	Radius Accuracy	Shank Diameter Tolerance	Outside Diameter	Diameter Tolerance	Radius Accuracy	Shank Diameter Tolerance
$0.2 \leq D \leq 0.6$	0/-0.01			$0.2 \leq D \leq 0.8$	0/-0.008		
$0.8 \leq D \leq 5$	0/-0.015	± 0.005	0/-0.005	$1 \leq D \leq 5$	0/-0.01	± 0.003	0/-0.004 (h4)
D=6	-0.005/-0.02			D=6	-0.005/-0.02		

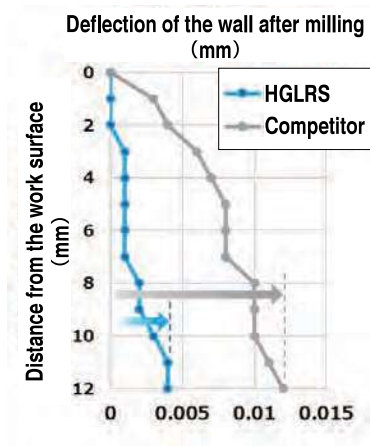
Dimensional accuracy comparison
HGLRS $\phi 3 \times CR0.3 \times EL16$

HAP72 (69HRC)

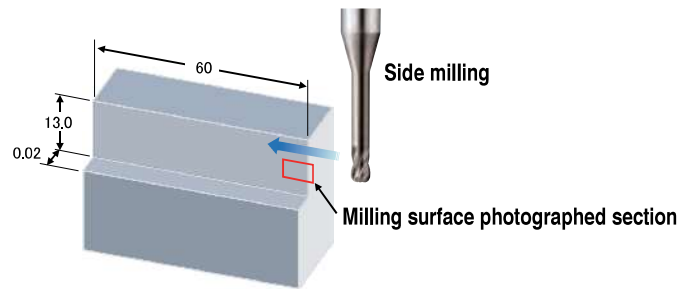
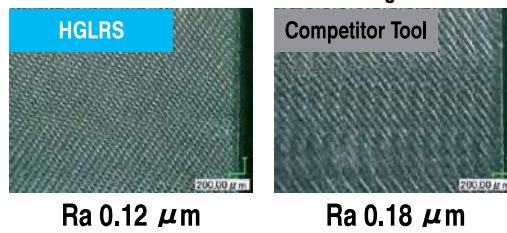
4 Flutes

Smaller dimensional change and better milling accuracy with HGLRS

Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p (mm)	a_e (mm)	Cycle Time	Coolant
7,000	1,800	0.03	0.02	15 min	Air Blow



Surface condition after milling

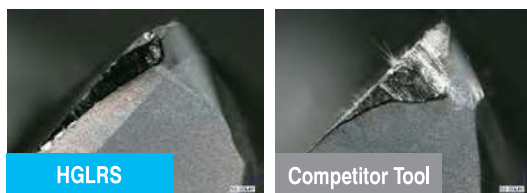


Wear width comparison
HGLRS $\phi 3 \times CR0.3 \times EL16$

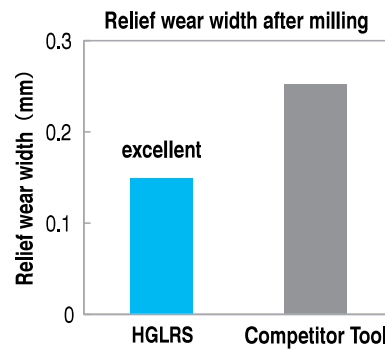
HAP72 (69HRC)

High efficiency milling and long tool life achieved even on new generation super hard materials.

Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p (mm)	a_e (mm)	Cycle Time	Coolant
7,000	900	0.03	0.6	68 min	Air Blow



Milling shape
 Square pocket 10 × 10 × 5 mm



- Ø3mm Shank V Series
- UDC-PCD Series
- CBN Series
- Square
 - Square
 - Long Neck Square
- Radius
 - Radius
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- Ball / Long Shank Ball
 - Ball
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- Taper
 - Taper
- Barrel
- Spiral V Cutter
- Drill
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Total 184 models

Unit (mm)

- φ3mm Shank V Series
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- Technical Data

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	Suggested Retail Price ¥				
HGLRS 4002-002-005	0.2	RO.02	0.5	0.12	0.185	16°	50	4	14,100				
HGLRS 4002-002-010			1				50	4	14,100				
HGLRS 4002-002-020			2				50	4	14,100				
HGLRS 4002-005-005		RO.05	0.5				50	4	14,100				
HGLRS 4002-005-010			1				50	4	14,100				
HGLRS 4002-005-020			2				50	4	14,100				
HGLRS 4003-002-005	0.3	RO.02	0.5	0.18	0.285	16°	50	4	14,100				
HGLRS 4003-002-010			1				50	4	14,100				
HGLRS 4003-002-015			1.5				50	4	14,100				
HGLRS 4003-002-020		2	50				4	14,100					
HGLRS 4003-005-005		RO.05	0.5				50	4	14,100				
HGLRS 4003-005-010			1				50	4	14,100				
HGLRS 4003-005-020	2		50	4	14,100								
HGLRS 4004-002-010	0.4	RO.02	1	0.24	0.385	16°	50	4	9,050				
HGLRS 4004-002-020			2				50	4	9,050				
HGLRS 4004-005-010		RO.05	1				50	4	9,050				
HGLRS 4004-005-020			2				50	4	9,050				
HGLRS 4004-01-010		RO.1	1				50	4	9,050				
HGLRS 4004-01-020			2				50	4	9,050				
HGLRS 4005-002-010	0.5	RO.02	1	0.3	0.485	16°	50	4	7,370				
HGLRS 4005-002-020			2				50	4	7,370				
HGLRS 4005-002-030			3				50	4	7,370				
HGLRS 4005-005-010		RO.05	1				50	4	7,370				
HGLRS 4005-005-020			2				50	4	7,370				
HGLRS 4005-005-030			3				50	4	7,370				
HGLRS 4005-01-010		RO.1	1				50	4	7,370				
HGLRS 4005-01-020			2				50	4	7,370				
HGLRS 4005-01-030			3				50	4	7,370				
HGLRS 4006-005-020		0.6	RO.05				2	0.36	0.585	16°	50	4	7,370
HGLRS 4006-005-040							4				50	4	7,370
HGLRS 4006-01-020			RO.1				2				50	4	7,370
HGLRS 4006-01-040	4			50	4	7,370							
HGLRS 4008-005-020	0.8	RO.05	2	0.48	0.78	16°	50	4	8,100				
HGLRS 4008-005-040			4				50	4	8,400				
HGLRS 4008-005-060			6				50	4	8,400				
HGLRS 4008-01-020		RO.1	2				50	4	8,100				
HGLRS 4008-01-040			4				50	4	8,400				
HGLRS 4008-01-060			6				50	4	8,400				
HGLRS 4008-02-020		RO.2	2				50	4	8,100				
HGLRS 4008-02-040			4				50	4	8,400				
HGLRS 4008-02-060	6		50	4	8,400								
HGLRS 4010-002-020	1	RO.02	2	0.8	0.98	16°	50	4	7,400				
HGLRS 4010-002-030			3				50	4	7,400				
HGLRS 4010-002-040			4				50	4	7,400				
HGLRS 4010-002-050			5				50	4	8,100				

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Unit (mm)

Model Number	Outside Diameter ϕD	Corner Radius CR	Effective Length l_1	Effective Length by Inclined Angles				
				30'	1°	1°30'	2°	3°
HGLRS 4002-002-005	0.2	R0.02	0.5	0.61	0.64	0.67	0.70	0.76
HGLRS 4002-002-010			1	1.13	1.18	1.23	1.28	1.38
HGLRS 4002-002-020			2	2.17	2.25	2.34	2.43	2.63
HGLRS 4002-005-005		R0.05	0.5	0.60	0.64	0.67	0.70	0.75
HGLRS 4002-005-010			1	1.13	1.18	1.22	1.27	1.37
HGLRS 4002-005-020			2	2.17	2.25	2.33	2.42	2.62
HGLRS 4003-002-005	0.3	R0.02	0.5	0.63	0.66	0.69	0.72	0.78
HGLRS 4003-002-010			1	1.15	1.20	1.24	1.29	1.40
HGLRS 4003-002-015			1.5	1.66	1.72	1.79	1.85	2.01
HGLRS 4003-002-020		2	2.18	2.26	2.34	2.43	2.63	
HGLRS 4003-005-005		R0.05	0.5	0.63	0.66	0.68	0.71	0.77
HGLRS 4003-005-010			1	1.15	1.20	1.24	1.29	1.39
HGLRS 4003-005-020	2		2.18	2.26	2.34	2.43	2.62	
HGLRS 4004-002-010	0.4	R0.02	1	1.15	1.20	1.24	1.29	1.40
HGLRS 4004-002-020			2	2.18	2.26	2.34	2.43	2.63
HGLRS 4004-005-010		R0.05	1	1.15	1.20	1.24	1.29	1.39
HGLRS 4004-005-020			2	2.18	2.26	2.34	2.43	2.62
HGLRS 4004-01-010		R0.1	1	1.15	1.19	1.23	1.28	1.38
HGLRS 4004-01-020			2	2.18	2.25	2.33	2.42	2.61
HGLRS 4005-002-010	0.5	R0.02	1	1.15	1.20	1.24	1.29	1.40
HGLRS 4005-002-020			2	2.18	2.26	2.34	2.43	2.63
HGLRS 4005-002-030			3	3.21	3.33	3.45	3.58	3.87
HGLRS 4005-005-010		R0.05	1	1.15	1.20	1.24	1.29	1.39
HGLRS 4005-005-020			2	2.18	2.26	2.34	2.43	2.62
HGLRS 4005-005-030			3	3.21	3.33	3.45	3.58	3.87
HGLRS 4005-01-010		R0.1	1	1.15	1.19	1.23	1.28	1.38
HGLRS 4005-01-020			2	2.18	2.25	2.33	2.42	2.61
HGLRS 4005-01-030			3	3.21	3.32	3.44	3.57	3.85
HGLRS 4006-005-020	0.6	R0.05	2	2.18	2.26	2.34	2.43	2.62
HGLRS 4006-005-040			4	4.25	4.40	4.55	4.72	5.11
HGLRS 4006-01-020		R0.1	2	2.18	2.25	2.33	2.42	2.61
HGLRS 4006-01-040			4	4.25	4.39	4.55	4.72	5.10
HGLRS 4008-005-020	0.8	R0.05	2	2.54	2.72	2.89	3.03	3.30
HGLRS 4008-005-040			4	4.68	4.94	5.16	5.35	5.79
HGLRS 4008-005-060			6	6.80	7.11	7.37	7.65	8.27
HGLRS 4008-01-020		R0.1	2	2.54	2.72	2.88	3.02	3.29
HGLRS 4008-01-040			4	4.68	4.93	5.15	5.34	5.77
HGLRS 4008-01-060			6	6.79	7.11	7.37	7.64	8.26
HGLRS 4008-02-020		R0.2	2	2.53	2.70	2.86	3.00	3.26
HGLRS 4008-02-040			4	4.67	4.92	5.14	5.33	5.75
HGLRS 4008-02-060			6	6.78	7.10	7.36	7.63	8.24
HGLRS 4010-002-020	1	R0.02	2	2.58	2.76	2.92	3.06	3.33
HGLRS 4010-002-030			3	3.65	3.87	4.06	4.23	4.57
HGLRS 4010-002-040			4	4.71	4.97	5.18	5.38	5.81
HGLRS 4010-002-050			5	5.77	6.05	6.29	6.53	7.06












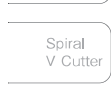
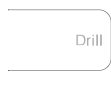



4 Flutes

- Ø3mm Shank V Series
- UDC-PCD Series
- CBN Series
- Square
- Long Neck Square
- Radius
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- Taper Neck Radius
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- Barrel
- Spiral V Cutter
- Drill
- Technical Data

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Unit (mm)

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

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	Suggested Retail Price ¥						
HGLRS 4010-005-020	1	RO.05	2	0.8	0.98	16°	50	4	7,400						
HGLRS 4010-005-030			3				50	4	7,400						
HGLRS 4010-005-040			4				50	4	7,400						
HGLRS 4010-005-050			5				50	4	8,100						
HGLRS 4010-01-020		RO.1	2				1.2	1.48	16°	50	4	7,400			
HGLRS 4010-01-030			3							50	4	7,400			
HGLRS 4010-01-040			4							50	4	7,400			
HGLRS 4010-01-050			5							50	4	8,100			
HGLRS 4010-02-020		RO.2	2							1.6	1.96	16°	50	4	7,400
HGLRS 4010-02-030			3										50	4	7,400
HGLRS 4010-02-040			4										50	4	7,400
HGLRS 4010-02-050			5										50	4	8,100
HGLRS 4015-005-030	1.5	RO.05	3	1.2	1.48	16°							50	4	7,900
HGLRS 4015-005-040			4										50	4	7,900
HGLRS 4015-005-060			6										50	4	7,900
HGLRS 4015-005-080			8										50	4	8,200
HGLRS 4015-01-030		RO.1	3				1.6	1.96	16°				50	4	7,900
HGLRS 4015-01-040			4										50	4	7,900
HGLRS 4015-01-060			6										50	4	7,900
HGLRS 4015-01-080			8										50	4	8,200
HGLRS 4015-02-030		RO.2	3							2.0	2.52	16°	50	4	7,900
HGLRS 4015-02-040			4										50	4	7,900
HGLRS 4015-02-060			6										50	4	7,900
HGLRS 4015-02-080			8										50	4	8,200
HGLRS 4015-03-030	RO.3	3	2.4	3.08	16°	50							4	7,900	
HGLRS 4015-03-040		4				50							4	7,900	
HGLRS 4015-03-060		6				50							4	7,900	
HGLRS 4015-03-080		8				50							4	8,200	
HGLRS 4015-05-040	RO.5	4				2.8	3.64	16°	50				4	7,900	
HGLRS 4015-05-060		6							50				4	7,900	
HGLRS 4015-05-080		8							50				4	8,200	
HGLRS 4020-002-040		2							RO.02				4	1.6	1.96
HGLRS 4020-002-060	6									50	4	7,900			
HGLRS 4020-002-080	8									50	4	8,200			
HGLRS 4020-002-100	10									50	4	8,200			
HGLRS 4020-005-040	RO.05								4	2.0	2.52	16°	50		
HGLRS 4020-005-060			6	50	4				7,900						
HGLRS 4020-005-080			8	50	4				8,200						
HGLRS 4020-005-100			10	50	4				8,200						
HGLRS 4020-01-040	RO.1		4	2.4	3.08				16°				50		
HGLRS 4020-01-060			6			50	4	7,900							
HGLRS 4020-01-080			8			50	4	8,200							
HGLRS 4020-01-100			10			50	4	8,200							
HGLRS 4020-02-040	RO.2	4	2.8			3.64	16°	50					4	7,900	
HGLRS 4020-02-060		6						50					4	7,900	
HGLRS 4020-02-080		8						50					4	8,200	
HGLRS 4020-02-100		10						50					4	8,200	

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Unit (mm)

Model Number	Outside Diameter φD	Corner Radius CR	Effective Length ℓ ₁	Effective Length by Inclined Angles					
				30°	1°	1°30'	2°	3°	
HGLRS 4010-005-020	1	RO.05	2	2.58	2.76	2.91	3.06	3.32	
HGLRS 4010-005-030			3	3.65	3.87	4.05	4.22	4.56	
HGLRS 4010-005-040			4	4.71	4.96	5.18	5.37	5.81	
HGLRS 4010-005-050			5	5.77	6.05	6.29	6.52	7.05	
HGLRS 4010-01-020		RO.1	2	2.58	2.75	2.90	3.05	3.31	
HGLRS 4010-01-030			3	3.65	3.86	4.05	4.21	4.55	
HGLRS 4010-01-040			4	4.71	4.96	5.17	5.36	5.80	
HGLRS 4010-01-050		RO.2	5	5.77	6.05	6.28	6.51	7.04	
HGLRS 4010-02-020			2	2.57	2.74	2.89	3.03	3.29	
HGLRS 4010-02-030			3	3.64	3.85	4.03	4.20	4.53	
HGLRS 4010-02-040			4	4.70	4.95	5.16	5.35	5.77	
HGLRS 4010-02-050		5	5.76	6.04	6.27	6.50	7.02		
HGLRS 4015-005-030	1.5	RO.05	3	3.12	3.23	3.35	3.48	3.76	
HGLRS 4015-005-040			4	4.16	4.30	4.46	4.63	5.00	
HGLRS 4015-005-060			6	6.22	6.44	6.67	6.92	7.49	
HGLRS 4015-005-080			8	8.29	8.58	8.89	9.22	9.97	
HGLRS 4015-01-030		RO.1	3	3.12	3.23	3.34	3.47	3.75	
HGLRS 4015-01-040			4	4.16	4.30	4.45	4.62	4.99	
HGLRS 4015-01-060			6	6.22	6.44	6.67	6.92	7.48	
HGLRS 4015-01-080			8	8.29	8.58	8.89	9.22	9.96	
HGLRS 4015-02-030		RO.2	3	3.12	3.22	3.33	3.45	3.72	
HGLRS 4015-02-040			4	4.15	4.29	4.44	4.60	4.97	
HGLRS 4015-02-060			6	6.22	6.43	6.66	6.90	7.45	
HGLRS 4015-02-080			8	8.29	8.57	8.87	9.20	9.94	
HGLRS 4015-03-030		RO.3	3	3.12	3.22	3.32	3.44	3.70	
HGLRS 4015-03-040			4	4.15	4.28	4.43	4.59	4.94	
HGLRS 4015-03-060			6	6.22	6.42	6.65	6.89	7.43	
HGLRS 4015-03-080			8	8.28	8.56	8.86	9.19	9.91	
HGLRS 4015-05-040		RO.5	4	4.14	4.27	4.41	4.56	4.89	
HGLRS 4015-05-060			6	6.21	6.41	6.63	6.86	7.38	
HGLRS 4015-05-080			8	8.28	8.55	8.84	9.16	9.87	
HGLRS 4020-002-040			2	RO.02	4	4.20	4.34	4.50	4.67
HGLRS 4020-002-060		6			6.26	6.48	6.72	6.97	7.54
HGLRS 4020-002-080		8			8.33	8.62	8.94	9.27	10.03
HGLRS 4020-002-100		10			10.40	10.76	11.15	11.57	12.51
HGLRS 4020-005-040		RO.05		4	4.20	4.34	4.50	4.67	5.05
HGLRS 4020-005-060	6			6.26	6.48	6.72	6.97	7.53	
HGLRS 4020-005-080	8			8.33	8.62	8.93	9.27	10.02	
HGLRS 4020-005-100	10			10.40	10.76	11.15	11.57	12.51	
HGLRS 4020-01-040	RO.1	4		4.19	4.34	4.49	4.66	5.04	
HGLRS 4020-01-060		6		6.26	6.48	6.71	6.96	7.52	
HGLRS 4020-01-080		8		8.33	8.62	8.93	9.26	10.01	
HGLRS 4020-01-100		10		10.40	10.76	11.14	11.56	12.49	
HGLRS 4020-02-040	RO.2	4		4.19	4.33	4.48	4.65	5.01	
HGLRS 4020-02-060		6		6.26	6.47	6.70	6.95	7.50	
HGLRS 4020-02-080		8		8.33	8.61	8.92	9.25	9.98	
HGLRS 4020-02-100		10		10.39	10.75	11.13	11.54	12.47	

4 Flutes

- 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

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4 Flutes HMGCOAT For Hard Materials

Unit (mm)

-  φ3mm Shark 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

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	Suggested Retail Price ¥					
HGLRS 4020-03-040	2	RO.3	4	1.6	1.96	16°	50	4	7,900					
HGLRS 4020-03-060			6				50	4	7,900					
HGLRS 4020-03-080			8				50	4	8,200					
HGLRS 4020-03-100			10				50	4	8,200					
HGLRS 4020-05-040		RO.5	4				50	4	7,900					
HGLRS 4020-05-060			6				50	4	7,900					
HGLRS 4020-05-080			8				50	4	8,200					
HGLRS 4020-05-100			10				50	4	8,200					
HGLRS 4030-005-040			3				RO.05	4	2.4	2.87	16°	50	6	7,100
HGLRS 4030-005-060								6				50	6	7,100
HGLRS 4030-005-080	8	50		6	7,100									
HGLRS 4030-005-100	10	50		6	7,100									
HGLRS 4030-005-120	12	50		6	8,600									
HGLRS 4030-005-160	16	60		6	10,600									
HGLRS 4030-01-040	RO.1	4		50	6	7,100								
HGLRS 4030-01-060		6		50	6	7,100								
HGLRS 4030-01-080		8		50	6	7,100								
HGLRS 4030-01-100		10		50	6	7,100								
HGLRS 4030-01-120		12		50	6	8,600								
HGLRS 4030-01-160		16		60	6	10,600								
HGLRS 4030-02-040	RO.2	4		50	6	7,100								
HGLRS 4030-02-060		6		50	6	7,100								
HGLRS 4030-02-080		8		50	6	7,100								
HGLRS 4030-02-100		10		50	6	7,100								
HGLRS 4030-02-120		12		50	6	8,600								
HGLRS 4030-02-160		16		60	6	10,600								
HGLRS 4030-03-040	RO.3	4		50	6	7,100								
HGLRS 4030-03-060		6		50	6	7,100								
HGLRS 4030-03-080		8		50	6	7,100								
HGLRS 4030-03-100		10		50	6	7,100								
HGLRS 4030-03-120		12		50	6	8,600								
HGLRS 4030-03-160		16		60	6	10,600								
HGLRS 4030-05-040	RO.5	4		50	6	7,100								
HGLRS 4030-05-060		6		50	6	7,100								
HGLRS 4030-05-080		8		50	6	7,100								
HGLRS 4030-05-100		10		50	6	7,100								
HGLRS 4030-05-120		12		50	6	8,600								
HGLRS 4030-05-160		16		60	6	10,600								
HGLRS 4030-10-060	R1	6	50	6	7,100									
HGLRS 4030-10-080		8	50	6	7,100									
HGLRS 4030-10-100		10	50	6	7,100									
HGLRS 4030-10-120		12	50	6	8,600									
HGLRS 4030-10-160		16	60	6	10,600									
HGLRS 4040-005-080		4	RO.05	8	3.2	3.77	16°	60	6	10,600				
HGLRS 4040-005-120	12			60				6	10,600					
HGLRS 4040-005-160	16			60				6	10,600					
HGLRS 4040-005-200	20			70				6	11,800					

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Unit (mm)

Model Number	Outside Diameter ϕD	Corner Radius CR	Effective Length l_1	Effective Length by Inclined Angles				
				30'	1°	1°30'	2°	3°
HGLRS 4020-03-040	2	R0.3	4	4.19	4.32	4.47	4.63	4.99
HGLRS 4020-03-060			6	6.25	6.46	6.69	6.93	7.47
HGLRS 4020-03-080			8	8.32	8.60	8.91	9.23	9.96
HGLRS 4020-03-100			10	10.39	10.74	11.12	11.53	12.45
HGLRS 4020-05-040		R0.5	4	4.18	4.31	4.45	4.60	4.94
HGLRS 4020-05-060			6	6.25	6.45	6.67	6.90	7.43
HGLRS 4020-05-080			8	8.32	8.59	8.88	9.20	9.91
HGLRS 4020-05-100			10	10.38	10.73	11.10	11.50	12.40
HGLRS 4030-005-040	3	R0.05	4	4.39	4.54	4.70	4.88	5.28
HGLRS 4030-005-060			6	6.45	6.68	6.92	7.18	7.76
HGLRS 4030-005-080			8	8.52	8.82	9.14	9.48	10.25
HGLRS 4030-005-100			10	10.59	10.96	11.35	11.78	12.74
HGLRS 4030-005-120		12	12.66	13.10	13.57	14.08	15.22	
HGLRS 4030-005-160		16	16.79	17.38	18.00	18.68	20.19	
HGLRS 4030-01-040		R0.1	4	4.38	4.54	4.70	4.87	5.27
HGLRS 4030-01-060			6	6.45	6.68	6.92	7.17	7.75
HGLRS 4030-01-080			8	8.52	8.81	9.13	9.47	10.24
HGLRS 4030-01-100			10	10.59	10.95	11.35	11.77	12.72
HGLRS 4030-01-120			12	12.65	13.09	13.56	14.07	15.21
HGLRS 4030-01-160		16	16.79	17.37	18.00	18.67	20.18	
HGLRS 4030-02-040		R0.2	4	4.38	4.53	4.69	4.86	5.24
HGLRS 4030-02-060			6	6.45	6.67	6.90	7.16	7.73
HGLRS 4030-02-080			8	8.52	8.81	9.12	9.46	10.21
HGLRS 4030-02-100			10	10.58	10.95	11.34	11.76	12.70
HGLRS 4030-02-120	12		12.65	13.09	13.55	14.06	15.19	
HGLRS 4030-02-160	16		16.79	17.37	17.99	18.66	20.16	
HGLRS 4030-03-040	R0.3	4	4.38	4.52	4.68	4.84	5.22	
HGLRS 4030-03-060		6	6.45	6.66	6.89	7.14	7.70	
HGLRS 4030-03-080		8	8.51	8.80	9.11	9.44	10.19	
HGLRS 4030-03-100		10	10.58	10.94	11.33	11.74	12.68	
HGLRS 4030-03-120		12	12.65	13.08	13.54	14.04	15.16	
HGLRS 4030-03-160	16	16.78	17.36	17.98	18.64	20.14		
HGLRS 4030-05-040	R0.5	4	4.37	4.51	4.66	4.81	5.17	
HGLRS 4030-05-060		6	6.44	6.65	6.87	7.11	7.66	
HGLRS 4030-05-080		8	8.51	8.79	9.09	9.41	10.14	
HGLRS 4030-05-100		10	10.57	10.93	11.31	11.71	12.63	
HGLRS 4030-05-120		12	12.64	13.07	13.52	14.01	15.12	
HGLRS 4030-05-160		16	16.78	17.34	17.96	18.61	20.09	
HGLRS 4030-10-060	R1	6	6.42	6.61	6.81	7.04	7.53	
HGLRS 4030-10-080		8	8.49	8.75	9.03	9.34	10.02	
HGLRS 4030-10-100		10	10.55	10.89	11.25	11.64	12.51	
HGLRS 4030-10-120		12	12.62	13.03	13.46	13.94	14.99	
HGLRS 4030-10-160		16	16.75	17.31	17.90	18.53	19.97	
HGLRS 4040-005-080	4	R0.05	8	8.71	9.02	9.34	9.69	10.48
HGLRS 4040-005-120			12	12.85	13.29	13.78	14.29	15.45
HGLRS 4040-005-160			16	16.98	17.57	18.21	18.89	No Interference
HGLRS 4040-005-200			20	21.12	21.85	22.64	23.49	No Interference

4 Flutes


 3mm 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


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4 Flutes HMGCOAT For Hard Materials

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	Suggested Retail Price ¥
HGLRS 4040-01-080	4	RO.1	8	3.2	3.77	16°	60	6	10,600
HGLRS 4040-01-120			12				60	6	10,600
HGLRS 4040-01-160			16				60	6	10,600
HGLRS 4040-01-200			20				70	6	11,800
HGLRS 4040-02-080		RO.2	8				60	6	10,600
HGLRS 4040-02-120			12				60	6	10,600
HGLRS 4040-02-160			16				60	6	10,600
HGLRS 4040-02-200			20				70	6	11,800
HGLRS 4040-03-080		RO.3	8				60	6	10,600
HGLRS 4040-03-120			12				60	6	10,600
HGLRS 4040-03-160			16				60	6	10,600
HGLRS 4040-03-200			20				70	6	11,800
HGLRS 4040-05-080		RO.5	8				60	6	10,600
HGLRS 4040-05-120			12				60	6	10,600
HGLRS 4040-05-160			16				60	6	10,600
HGLRS 4040-05-200			20				70	6	11,800
HGLRS 4040-10-080		R1	8				60	6	10,600
HGLRS 4040-10-120			12				60	6	10,600
HGLRS 4040-10-160			16				60	6	10,600
HGLRS 4040-10-200			20				70	6	11,800
HGLRS 4060-01-120	6	RO.1	12	4.8	5.77	—	60	6	15,400
HGLRS 4060-01-160			16				60	6	15,400
HGLRS 4060-01-200			20				70	6	15,400
HGLRS 4060-01-240			24				70	6	15,400
HGLRS 4060-01-300			30				100	6	18,000
HGLRS 4060-02-120		RO.2	12				60	6	15,400
HGLRS 4060-02-160			16				60	6	15,400
HGLRS 4060-02-200			20				70	6	15,400
HGLRS 4060-02-240			24				70	6	15,400
HGLRS 4060-02-300			30				100	6	18,000
HGLRS 4060-03-120		RO.3	12				60	6	15,400
HGLRS 4060-03-160			16				60	6	15,400
HGLRS 4060-03-200			20				70	6	15,400
HGLRS 4060-03-240			24				70	6	15,400
HGLRS 4060-03-300			30				100	6	18,000
HGLRS 4060-05-120		RO.5	12				60	6	15,400
HGLRS 4060-05-160			16				60	6	15,400
HGLRS 4060-05-200			20				70	6	15,400
HGLRS 4060-05-240			24				70	6	15,400
HGLRS 4060-05-300			30				100	6	18,000
HGLRS 4060-10-120		R1	12				60	6	15,400
HGLRS 4060-10-160			16				60	6	15,400
HGLRS 4060-10-200			20				70	6	15,400
HGLRS 4060-10-240			24				70	6	15,400
HGLRS 4060-10-300			30				100	6	18,000

- $\phi 3$ mm Shark 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

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Unit (mm)

Model Number	Outside Diameter ϕD	Corner Radius CR	Effective Length l_1	Effective Length by Inclined Angles				
				30°	1°	1°30'	2°	3°
HGLRS 4040-01-080	4	RO.1	8	8.71	9.01	9.34	9.68	10.47
HGLRS 4040-01-120			12	12.85	13.29	13.77	14.28	15.44
HGLRS 4040-01-160			16	16.98	17.57	18.20	18.88	No Interference
HGLRS 4040-01-200			20	21.11	21.85	22.64	23.48	No Interference
HGLRS 4040-02-080		RO.2	8	8.71	9.01	9.33	9.67	10.44
HGLRS 4040-02-120			12	12.84	13.28	13.76	14.27	15.42
HGLRS 4040-02-160			16	16.98	17.56	18.19	18.87	No Interference
HGLRS 4040-02-200			20	21.11	21.84	22.63	23.47	No Interference
HGLRS 4040-03-080		RO.3	8	8.70	9.00	9.32	9.66	10.42
HGLRS 4040-03-120			12	12.84	13.28	13.75	14.25	15.39
HGLRS 4040-03-160			16	16.97	17.56	18.18	18.85	No Interference
HGLRS 4040-03-200			20	21.11	21.83	22.61	23.45	No Interference
HGLRS 4040-05-080		RO.5	8	8.70	8.98	9.29	9.63	10.37
HGLRS 4040-05-120			12	12.83	13.26	13.73	14.23	15.35
HGLRS 4040-05-160			16	16.97	17.54	18.16	18.82	No Interference
HGLRS 4040-05-200			20	21.10	21.82	22.59	23.42	No Interference
HGLRS 4040-10-080		R1	8	8.68	8.95	9.24	9.55	10.25
HGLRS 4040-10-120			12	12.81	13.23	13.67	14.15	15.22
HGLRS 4040-10-160			16	16.95	17.50	18.10	18.75	20.19
HGLRS 4040-10-200			20	21.08	21.78	22.54	23.35	No Interference
HGLRS 4060-01-120	6	RO.1	12	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-01-160			16	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-01-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-01-240			24	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-01-300			30	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-02-120		RO.2	12	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-02-160			16	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-02-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-02-240			24	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-02-300			30	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-03-120		RO.3	12	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-03-160			16	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-03-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-03-240			24	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-03-300			30	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-05-120		RO.5	12	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-05-160			16	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-05-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-05-240			24	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-05-300			30	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-10-120		R1	12	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-10-160			16	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-10-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-10-240			24	No Interference	No Interference	No Interference	No Interference	No Interference
HGLRS 4060-10-300			30	No Interference	No Interference	No Interference	No Interference	No Interference

4 Flutes

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

Milling Conditions for HGLRS

- 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

WORK MATERIAL				PREHARDENED STEELS / HARDENED STEELS NAK / STAVAX (~55HRC)				HARDENED STEELS SKD11 (55~62HRC)				HARDENED STEELS HAP10 (62~66HRC)				HARDENED STEELS HAP72 (66~70HRC)			
Model Number	Outside Diameter (mm)	Corner Radius (mm)	Effective Length (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)
4002	0.2	R0.02	0.5	27,000	500	0.004	0.05	27,000	260	0.003	0.02	27,000	280	0.003	0.01	27,000	250	0.003	0.01
			1	27,000	390	0.004	0.05	27,000	170	0.003	0.02	27,000	210	0.003	0.01	27,000	190	0.003	0.01
			2	27,000	80	0.004	0.05	27,000	25	0.003	0.02	27,000	30	0.003	0.01	27,000	25	0.003	0.01
		R0.05	0.5	27,000	590	0.004	0.05	27,000	260	0.003	0.02	27,000	280	0.003	0.01	27,000	250	0.003	0.01
			1	27,000	450	0.004	0.05	27,000	170	0.003	0.02	27,000	210	0.003	0.01	27,000	190	0.003	0.01
			2	27,000	80	0.004	0.05	27,000	25	0.003	0.02	27,000	30	0.003	0.01	27,000	25	0.003	0.01
4003	0.3	R0.02	0.5	25,500	600	0.008	0.09	25,500	460	0.003	0.04	25,500	480	0.003	0.03	25,000	440	0.003	0.03
			1	25,500	480	0.008	0.09	25,500	440	0.003	0.04	25,500	460	0.003	0.03	25,000	420	0.003	0.03
			1.5	25,500	360	0.008	0.09	25,500	280	0.003	0.04	25,500	300	0.003	0.03	25,000	270	0.003	0.03
		R0.05	0.5	25,500	240	0.008	0.09	25,500	200	0.003	0.04	25,500	220	0.003	0.03	25,000	200	0.003	0.03
			1	25,500	700	0.008	0.09	25,500	460	0.003	0.04	25,500	480	0.004	0.03	25,000	440	0.004	0.03
			2	25,500	560	0.008	0.09	25,500	440	0.003	0.04	25,500	460	0.004	0.03	25,000	420	0.004	0.03
4004	0.4	R0.02	1	23,000	720	0.01	0.13	18,300	700	0.004	0.07	20,500	720	0.003	0.05	20,000	650	0.003	0.05
			2	20,500	540	0.01	0.13	16,100	420	0.004	0.07	18,000	440	0.003	0.05	17,500	400	0.003	0.05
			1	23,000	840	0.015	0.13	18,300	700	0.004	0.07	20,500	720	0.004	0.05	20,000	650	0.004	0.05
		R0.05	2	20,500	630	0.015	0.13	16,100	420	0.006	0.07	18,000	440	0.004	0.05	17,500	400	0.004	0.05
			1	23,000	840	0.015	0.13	18,300	700	0.006	0.07	20,500	720	0.007	0.05	20,000	650	0.007	0.05
			2	20,500	630	0.015	0.13	16,100	420	0.006	0.07	18,000	440	0.007	0.05	17,500	400	0.007	0.05
4005	0.5	R0.02	1	22,500	920	0.01	0.17	17,900	880	0.006	0.09	20,000	900	0.004	0.07	19,500	820	0.004	0.07
			2	20,000	830	0.01	0.17	15,700	660	0.006	0.09	17,500	680	0.004	0.07	17,000	620	0.004	0.07
			3	18,000	730	0.01	0.17	13,900	530	0.006	0.09	15,500	550	0.004	0.07	15,000	500	0.004	0.07
		R0.05	1	22,500	1,080	0.017	0.17	17,900	880	0.009	0.09	20,000	900	0.007	0.07	19,500	820	0.007	0.07
			2	20,000	970	0.017	0.17	15,700	660	0.009	0.09	17,500	680	0.007	0.07	17,000	620	0.007	0.07
			3	18,000	850	0.017	0.17	13,900	530	0.009	0.09	15,500	550	0.007	0.07	15,000	500	0.007	0.07
R0.1	1	22,500	1,080	0.017	0.17	17,900	880	0.009	0.09	20,000	900	0.007	0.07	19,500	820	0.007	0.07		
	2	20,000	970	0.017	0.17	15,700	660	0.009	0.09	17,500	680	0.007	0.07	17,000	620	0.007	0.07		
	3	18,000	850	0.017	0.17	13,900	530	0.009	0.09	15,500	550	0.007	0.07	15,000	500	0.007	0.07		
4006	0.6	R0.05	2	21,500	1,050	0.021	0.2	17,000	710	0.015	0.12	19,000	730	0.007	0.1	18,500	660	0.007	0.1
			4	17,000	730	0.021	0.2	13,000	310	0.015	0.12	14,500	330	0.007	0.1	14,000	300	0.007	0.1
		R0.1	2	21,500	1,050	0.021	0.2	17,000	710	0.015	0.12	19,000	730	0.007	0.1	18,500	660	0.007	0.1
			4	17,000	730	0.021	0.2	13,000	310	0.015	0.12	14,500	330	0.007	0.1	14,000	300	0.007	0.1
4008	0.8	R0.05	2	20,500	1,330	0.028	0.26	15,700	830	0.02	0.16	17,500	850	0.01	0.15	15,500	770	0.01	0.15
			4	16,500	1,020	0.028	0.26	12,500	530	0.02	0.16	14,000	550	0.01	0.15	13,500	500	0.01	0.15
			6	14,000	840	0.028	0.26	10,300	420	0.02	0.16	11,500	440	0.01	0.15	11,000	400	0.01	0.15
		R0.1	2	20,500	1,330	0.028	0.26	15,700	830	0.02	0.16	17,500	850	0.01	0.15	15,500	770	0.01	0.15
			4	16,500	1,020	0.028	0.26	12,500	640	0.02	0.16	14,000	660	0.01	0.15	13,500	600	0.01	0.15
			6	14,000	840	0.028	0.26	10,300	420	0.02	0.16	11,500	440	0.01	0.15	11,000	400	0.01	0.15
R0.2	2	20,500	1,330	0.028	0.26	15,700	830	0.02	0.16	17,500	850	0.015	0.15	15,500	770	0.015	0.15		
	4	16,500	1,020	0.028	0.26	12,500	640	0.02	0.16	14,000	660	0.015	0.15	13,500	600	0.015	0.15		
	6	14,000	840	0.028	0.26	10,300	420	0.02	0.16	11,500	440	0.015	0.15	11,000	400	0.015	0.15		

Milling Conditions for HGLRS

WORK MATERIAL				PREHARDENED STEELS / HARDENED STEELS NAK / STAVAX (~55HRC)				HARDENED STEELS SKD11 (55~62HRC)				HARDENED STEELS HAP10 (62~66HRC)				HARDENED STEELS HAP72 (66~70HRC)						
Model Number	Outside Diameter (mm)	Corner Radius (mm)	Effective Length (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)			
4010	1	R0.02	2	15,300	1,200	0.004	0.027	10,300	710	0.003	0.003	8,900	800	0.003	0.003	8,600	780	0.003	0.003			
			3	13,200	1,150	0.004	0.027	9,400	680	0.003	0.003	8,500	770	0.003	0.003	8,300	750	0.003	0.003			
			4	12,000	1,070	0.003	0.024	8,500	640	0.003	0.003	8,100	730	0.003	0.003	7,900	710	0.003	0.003			
			5	11,000	960	0.003	0.023	7,800	570	0.003	0.003	7,700	700	0.003	0.003	7,500	680	0.003	0.003			
		R0.05	2	15,300	1,200	0.01	0.068	10,300	710	0.005	0.006	8,900	800	0.004	0.004	8,600	780	0.004	0.004			
			3	13,200	1,150	0.009	0.068	9,400	680	0.004	0.005	8,500	770	0.004	0.003	8,300	750	0.004	0.003			
			4	12,000	1,070	0.008	0.061	8,500	640	0.004	0.005	8,100	730	0.004	0.003	7,900	710	0.004	0.003			
		R0.1 R0.2	2	15,300	1,200	0.04	0.27	10,300	710	0.03	0.27	8,900	800	0.02	0.27	8,600	780	0.02	0.26			
			3	13,200	1,150	0.04	0.27	9,400	680	0.03	0.27	8,500	770	0.02	0.25	8,300	750	0.02	0.24			
			4	12,000	1,070	0.03	0.24	8,500	640	0.02	0.24	8,100	730	0.01	0.23	7,900	710	0.01	0.22			
		4015	1.5	R0.05	3	14,800	1,330	0.013	0.135	8,900	760	0.005	0.007	8,800	870	0.005	0.006	8,500	840	0.005	0.006	
					4	13,200	1,280	0.011	0.124	8,600	740	0.005	0.007	8,500	840	0.005	0.005	8,300	820	0.005	0.005	
6	10,600				1,210	0.01	0.111	8,100	690	0.004	0.006	8,000	790	0.004	0.005	7,800	770	0.004	0.005			
R0.1 R0.2 R0.3 R0.5	8			9,300	1,020	0.008	0.087	7,900	690	0.004	0.006	7,700	780	0.004	0.004	7,500	760	0.004	0.004			
	3			14,800	1,330	0.05	0.54	8,900	760	0.02	0.66	8,800	870	0.02	0.41	8,500	840	0.02	0.4			
	4			13,200	1,280	0.04	0.5	8,600	740	0.02	0.62	8,500	840	0.02	0.39	8,300	820	0.02	0.38			
	6			10,600	1,210	0.04	0.45	8,100	690	0.02	0.56	8,000	790	0.02	0.35	7,800	770	0.02	0.34			
	8			9,300	1,020	0.03	0.35	7,600	650	0.02	0.52	7,500	740	0.02	0.31	7,300	720	0.02	0.3			
	4020			2	R0.02	4	14,300	1,460	0.01	0.118	8,600	860	0.003	0.003	8,500	930	0.003	0.003	8,300	900	0.003	0.003
						6	12,000	1,200	0.006	0.109	8,300	830	0.003	0.003	8,100	890	0.003	0.003	7,900	860	0.003	0.003
8		10,400	1,100			0.006	0.1	7,900	790	0.003	0.003	7,800	840	0.003	0.003	7,600	820	0.003	0.003			
10		9,300	1,020			0.005	0.086	7,500	750	0.003	0.003	7,400	800	0.003	0.003	7,200	780	0.003	0.003			
R0.05		4	14,300		1,460	0.016	0.24	8,600	860	0.007	0.01	8,500	930	0.007	0.007	8,300	900	0.007	0.007			
		6	12,000		1,200	0.015	0.219	8,300	830	0.006	0.009	8,100	890	0.006	0.007	7,900	860	0.006	0.007			
		8	10,400		1,100	0.014	0.197	7,900	790	0.006	0.008	7,800	840	0.006	0.006	7,600	820	0.006	0.006			
R0.1		10	9,300		1,020	0.012	0.165	7,500	750	0.005	0.008	7,400	800	0.005	0.006	7,200	780	0.005	0.006			
		4	14,300		1,460	0.033	0.405	8,600	860	0.013	0.18	8,500	930	0.013	0.134	8,300	900	0.013	0.13			
		6	12,000		1,200	0.03	0.365	8,300	830	0.012	0.166	8,100	890	0.012	0.124	7,900	860	0.012	0.12			
		8	10,400		1,100	0.028	0.324	7,900	790	0.011	0.152	7,800	840	0.011	0.113	7,600	820	0.011	0.11			
R0.2 R0.3 R0.5		10	9,300		1,020	0.024	0.263	7,500	750	0.01	0.138	7,400	800	0.01	0.103	7,200	780	0.01	0.1			
	4	14,300	1,460	0.07	0.81	8,600	860	0.03	0.9	8,500	930	0.03	0.54	8,300	900	0.03	0.52					
	6	12,000	1,200	0.06	0.73	8,300	830	0.02	0.83	8,100	890	0.02	0.49	7,900	860	0.02	0.48					
	8	10,400	1,100	0.06	0.65	7,900	790	0.02	0.76	7,800	840	0.02	0.45	7,600	820	0.02	0.44					
			10	9,300	1,020	0.05	0.53	7,500	750	0.02	0.69	7,400	800	0.02	0.41	7,200	780	0.02	0.4			

4 Flutes

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

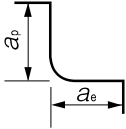
Milling Conditions for HGLRS

- 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

WORK MATERIAL				PREHARDENED STEELS / HARDENED STEELS NAK / STAVAX (~55HRC)				HARDENED STEELS SKD11 (55~62HRC)				HARDENED STEELS HAP10 (62~66HRC)				HARDENED STEELS HAP72 (66~70HRC)					
Model Number	Outside Diameter (mm)	Corner Radius (mm)	Effective Length (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p Axial Depth (mm)	a _e Radial Depth (mm)		
4030	3	R0.05	4	14,000	2,640	0.02	0.18	8,900	1,140	0.011	0.013	8,700	1,110	0.011	0.012	8,400	1,080	0.011	0.012		
			6	13,300	2,500	0.019	0.18	8,600	1,110	0.01	0.012	8,400	1,080	0.01	0.011	8,200	1,050	0.01	0.011		
			8	11,800	2,200	0.018	0.175	8,400	1,080	0.01	0.012	8,100	1,050	0.01	0.011	7,900	1,020	0.01	0.011		
			10	10,500	2,090	0.015	0.175	8,100	1,050	0.009	0.011	7,900	1,020	0.009	0.01	7,700	990	0.009	0.01		
			12	10,000	1,950	0.013	0.168	7,900	1,010	0.009	0.01	7,700	990	0.009	0.01	7,500	960	0.009	0.009		
			16	8,800	1,600	0.01	0.158	7,400	950	0.008	0.01	7,200	930	0.008	0.009	7,000	900	0.008	0.008		
		R0.1	4	14,000	2,640	0.04	0.36	8,900	1,140	0.021	0.291	8,700	1,110	0.022	0.216	8,400	1,080	0.021	0.21		
			6	13,300	2,500	0.038	0.36	8,600	1,110	0.02	0.277	8,400	1,080	0.021	0.206	8,200	1,050	0.02	0.2		
			8	11,800	2,200	0.035	0.35	8,400	1,080	0.019	0.263	8,100	1,050	0.02	0.196	7,900	1,020	0.019	0.19		
			10	10,500	2,090	0.03	0.35	8,100	1,050	0.018	0.249	7,900	1,020	0.019	0.185	7,700	990	0.018	0.18		
			12	10,000	1,950	0.026	0.335	7,900	1,010	0.017	0.235	7,700	990	0.018	0.175	7,500	960	0.017	0.17		
			16	8,800	1,600	0.02	0.315	7,400	950	0.015	0.208	7,200	930	0.015	0.155	7,000	900	0.015	0.15		
		R0.2 R0.3 R0.5 R1	4	14,000	2,640	0.08	0.72	8,900	1,140	0.04	1.45	8,700	1,110	0.04	0.87	8,400	1,080	0.04	0.84		
			6	13,300	2,500	0.08	0.72	8,600	1,110	0.04	1.38	8,400	1,080	0.04	0.82	8,200	1,050	0.04	0.8		
			8	11,800	2,200	0.07	0.7	8,400	1,080	0.04	1.31	8,100	1,050	0.04	0.78	7,900	1,020	0.04	0.76		
			10	10,500	2,090	0.06	0.7	8,100	1,050	0.04	1.25	7,900	1,020	0.04	0.74	7,700	990	0.04	0.72		
			12	10,000	1,950	0.05	0.67	7,900	1,010	0.03	1.18	7,700	990	0.04	0.7	7,500	960	0.03	0.68		
			16	8,800	1,600	0.04	0.63	7,400	950	0.03	1	7,200	930	0.03	0.62	7,000	900	0.03	0.6		
		4040	4	R0.05	8	8,500	1,420	0.026	0.338	6,200	1,130	0.013	0.016	6,100	1,090	0.013	0.015	5,900	1,060	0.013	0.014
					12	7,600	1,390	0.023	0.288	5,900	1,080	0.012	0.014	5,800	1,040	0.012	0.014	5,600	1,010	0.012	0.013
					16	6,600	1,330	0.018	0.25	5,700	1,030	0.011	0.013	5,600	1,000	0.011	0.013	5,400	970	0.011	0.012
					20	5,800	1,260	0.015	0.225	5,400	980	0.01	0.012	5,300	950	0.01	0.011	5,100	920	0.01	0.011
				R0.1	8	8,500	1,420	0.052	0.675	6,200	1,130	0.026	0.36	6,100	1,090	0.027	0.268	5,900	1,060	0.026	0.26
					12	7,600	1,390	0.046	0.575	5,900	1,080	0.024	0.332	5,800	1,040	0.025	0.247	5,600	1,010	0.024	0.24
16	6,600				1,330	0.036	0.5	5,700	1,030	0.022	0.304	5,600	1,000	0.023	0.227	5,400	970	0.022	0.22		
20	5,800				1,260	0.03	0.45	5,400	980	0.02	0.277	5,300	950	0.021	0.206	5,100	920	0.02	0.2		
R0.2 R0.3 R0.5 R1	8			8,500	1,420	0.1	1.35	6,200	1,130	0.05	1.8	6,100	1,090	0.05	1.07	5,900	1,060	0.05	1.04		
	12			7,600	1,390	0.09	1.15	5,900	1,080	0.05	1.66	5,800	1,040	0.05	0.99	5,600	1,010	0.05	0.96		
	16			6,600	1,330	0.07	1	5,700	1,030	0.04	1.52	5,600	1,000	0.05	0.91	5,400	970	0.04	0.88		
	20			5,800	1,260	0.06	0.9	5,400	980	0.04	1.38	5,300	950	0.04	0.82	5,100	920	0.04	0.8		
4060	6	R0.1	12	4,700	1,360	0.1	0.675	3,900	1,180	0.033	0.676	3,800	1,150	0.033	0.502	3,700	1,120	0.033	0.488		
			16	4,000	1,150	0.095	0.665	3,800	1,150	0.031	0.641	3,700	1,110	0.032	0.476	3,600	1,080	0.031	0.463		
			20	3,500	1,000	0.09	0.655	3,700	1,120	0.029	0.607	3,600	1,080	0.03	0.451	3,500	1,050	0.029	0.438		
			24	3,100	860	0.085	0.645	3,600	1,080	0.028	0.572	3,500	1,050	0.028	0.425	3,400	1,020	0.028	0.413		
			30	2,600	740	0.079	0.63	3,400	1,030	0.025	0.52	3,300	1,000	0.026	0.386	3,200	970	0.025	0.375		
			12	4,700	1,360	0.2	1.35	3,900	1,180	0.07	3.38	3,800	1,150	0.07	2	3,700	1,120	0.07	1.95		
		R0.2 R0.3 R0.5 R1	16	4,000	1,150	0.19	1.33	3,800	1,150	0.06	3.21	3,700	1,110	0.06	1.9	3,600	1,080	0.06	1.85		
			20	3,500	1,000	0.18	1.31	3,700	1,120	0.06	3	3,600	1,080	0.06	1.8	3,500	1,050	0.06	1.75		
			24	3,100	860	0.17	1.29	3,600	1,080	0.06	2.86	3,500	1,050	0.06	1.7	3,400	1,020	0.06	1.65		
			30	2,600	740	0.16	1.26	3,400	1,030	0.05	2.6	3,300	1,000	0.05	1.55	3,200	970	0.05	1.5		

Note:

- Decrease the feed rate more than 50% from the milling parameters when slot milling.
- Decrease both spindle speed and feed rate proportionally when the milling parameters exceed the machine's maximum spindle speed, or when chattering and red-hot occur.
- Every coolant offers stable milling.



4 Flutes

Ø3mm Shank
V Series

UDC-PCD
Series

CBN
Series

Square

Square

Long Neck
Square

Radius

Radius

Long Neck
Radius

Taper Neck
Radius

Ball

Ball / Long
Shank Ball

Long Neck
Ball

Taper Neck
Ball

Taper

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data