



Size  $\phi 0.8 \sim \phi 6$

# HLRS4000



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
			~55HRC	~60HRC	~70HRC										
○	○	●	●	●	○				○			○	○		

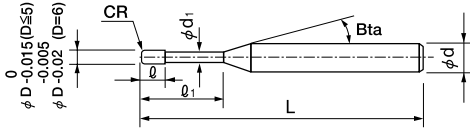
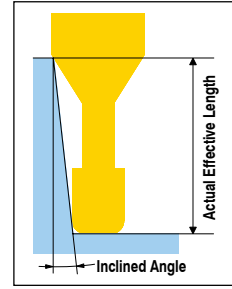
Total 219 models

Unit (mm)

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $\ell_1$	Length of Cut $\ell$	Neck Diameter $\phi d_1$	Shank Taper Angle Bta	Overall Length L	Shank Diameter $\phi d$	Price (¥)
HLRS 4008-005-020	0.8	R0.05	2	0.48	0.78	16°	50	4	8,100
HLRS 4008-005-030			3				50	4	8,100
HLRS 4008-005-040			4				50	4	8,400
HLRS 4008-005-060			6				50	4	8,400
HLRS 4008-01-020		R0.1	2				50	4	8,100
HLRS 4008-01-030			3				50	4	8,100
HLRS 4008-01-040			4				50	4	8,400
HLRS 4008-01-060			6				50	4	8,400
HLRS 4008-02-020		R0.2	2				50	4	8,100
HLRS 4008-02-030			3				50	4	8,100
HLRS 4008-02-040			4				50	4	8,400
HLRS 4008-02-060			6				50	4	8,400
HLRS 4010-005-020	1	R0.05	2	0.8	0.95	16°	50	4	7,400
HLRS 4010-005-030			3				50	4	7,400
HLRS 4010-005-040			4				50	4	7,400
HLRS 4010-005-050			5				50	4	8,100
HLRS 4010-005-060			6				50	4	8,100
HLRS 4010-005-080			8				50	4	8,100
HLRS 4010-005-100		10	50	4	8,100				
HLRS 4010-01-020		R0.1	2	0.8	0.95	16°	50	4	7,400
HLRS 4010-01-030			3				50	4	7,400
HLRS 4010-01-040			4				50	4	7,400
HLRS 4010-01-050			5				50	4	8,100
HLRS 4010-01-060			6				50	4	8,100
HLRS 4010-01-080			8				50	4	8,100
HLRS 4010-01-100		10	50	4	8,100				
HLRS 4010-02-020		R0.2	2	0.8	0.95	16°	50	4	7,400
HLRS 4010-02-030			3				50	4	7,400
HLRS 4010-02-040			4				50	4	7,400
HLRS 4010-02-050			5				50	4	8,100
HLRS 4010-02-060	6		50				4	8,100	
HLRS 4010-02-080	8		50				4	8,100	
HLRS 4010-02-100	10		50				4	8,100	

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The 4 flute design offers high milling efficiency and accuracy.  
 The rigid tool geometry offers longer tool life when milling Hardened Steels.  
 Suitable for both dry and wet coolant types.  
 HARDMAX ensures improved heat resistance.  
 Refer to page 168 for 2 flute HLRS.



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.

Unit (mm)

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $l_1$	Effective Length by Inclined Angles				
				30'	1°	1°30'	2°	3°
HLRS 4008-005-020	0.8	RO.05	2	2.45	2.65	2.82	2.98	3.26
HLRS 4008-005-030			3	3.53	3.78	3.98	4.16	4.48
HLRS 4008-005-040			4	4.61	4.89	5.11	5.31	5.71
HLRS 4008-005-060			6	6.73	7.07	7.33	7.59	8.15
HLRS 4008-01-020		RO.1	2	2.44	2.65	2.82	2.97	3.24
HLRS 4008-01-030			3	3.53	3.77	3.97	4.15	4.47
HLRS 4008-01-040			4	4.60	4.88	5.11	5.30	5.69
HLRS 4008-01-060			6	6.73	7.06	7.33	7.58	8.14
HLRS 4008-02-020		RO.2	2	2.43	2.63	2.80	2.95	3.22
HLRS 4008-02-030			3	3.52	3.76	3.96	4.13	4.45
HLRS 4008-02-040			4	4.60	4.87	5.09	5.29	5.67
HLRS 4008-02-060			6	6.73	7.05	7.32	7.57	8.12
HLRS 4010-005-020	1	RO.05	2	2.54	2.72	2.88	3.03	3.30
HLRS 4010-005-030			3	3.61	3.84	4.03	4.20	4.52
HLRS 4010-005-040			4	4.68	4.94	5.15	5.34	5.74
HLRS 4010-005-050			5	5.74	6.03	6.26	6.48	6.97
HLRS 4010-005-060			6	6.79	7.11	7.37	7.62	8.19
HLRS 4010-005-080			8	8.89	9.25	9.57	9.90	10.64
HLRS 4010-005-100			10	10.98	11.39	11.77	12.18	13.09
HLRS 4010-01-020			RO.1	2	2.53	2.71	2.87	3.02
HLRS 4010-01-030		3		3.61	3.83	4.02	4.19	4.51
HLRS 4010-01-040		4		4.67	4.93	5.15	5.34	5.73
HLRS 4010-01-050		5		5.73	6.02	6.26	6.48	6.96
HLRS 4010-01-060		6		6.79	7.10	7.36	7.61	8.18
HLRS 4010-01-080		8		8.89	9.25	9.56	9.89	10.63
HLRS 4010-01-100		10		10.98	11.38	11.76	12.17	13.07
HLRS 4010-02-020		RO.2		2	2.52	2.70	2.86	3.00
HLRS 4010-02-030			3	3.60	3.82	4.01	4.18	4.49
HLRS 4010-02-040			4	4.67	4.92	5.13	5.32	5.71
HLRS 4010-02-050			5	5.73	6.01	6.25	6.46	6.93
HLRS 4010-02-060			6	6.78	7.10	7.35	7.60	8.16
HLRS 4010-02-080			8	8.89	9.24	9.55	9.88	10.61
HLRS 4010-02-100	10		10.98	11.38	11.75	12.16	13.05	

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Square

Square  
Long Neck Square

Radius

Radius  
Long Neck Radius

Ball / Long Shank Ball

Ball  
Long Neck Ball

Taper Neck Ball

Taper  
Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $\ell_1$	Length of Cut $\ell$	Neck Diameter $\phi d_1$	Shank Taper Angle Bta	Overall Length L	Shank Diameter $\phi d$	Price (¥)
HLRS 4010-03-020	1	R0.3	2	0.8	0.95	16°	50	4	7,400
HLRS 4010-03-030			3				50	4	7,400
HLRS 4010-03-040			4				50	4	7,400
HLRS 4010-03-050			5				50	4	8,100
HLRS 4010-03-060			6				50	4	8,100
HLRS 4010-03-080			8				50	4	8,100
HLRS 4010-03-100			10				50	4	8,100
HLRS 4012-01-040	1.2	R0.1	4	0.96	1.14	16°	50	4	8,400
HLRS 4012-01-060			6				50	4	8,400
HLRS 4012-01-100			10				50	4	8,400
HLRS 4012-02-040		R0.2	4				50	4	8,400
HLRS 4012-02-060			6				50	4	8,400
HLRS 4012-02-100			10				50	4	8,400
HLRS 4012-03-040			R0.3				4	50	4
HLRS 4012-03-060	6	50		4	8,400				
HLRS 4012-03-100	10	50		4	8,400				
HLRS 4015-005-040	1.5	R0.05	4	1.2	1.45	16°	50	4	7,900
HLRS 4015-005-060			6				50	4	7,900
HLRS 4015-005-080			8				50	4	8,200
HLRS 4015-01-040		R0.1	4				50	4	7,900
HLRS 4015-01-060			6				50	4	7,900
HLRS 4015-01-080			8				50	4	8,200
HLRS 4015-01-100			10				50	4	8,200
HLRS 4015-01-120			12				55	4	8,200
HLRS 4015-01-160			16				60	4	8,200
HLRS 4015-02-040		R0.2	4				50	4	7,900
HLRS 4015-02-060			6				50	4	7,900
HLRS 4015-02-080			8				50	4	8,200
HLRS 4015-02-100			10				50	4	8,200
HLRS 4015-02-120			12				55	4	8,200
HLRS 4015-02-160			16				60	4	8,200
HLRS 4015-03-040		R0.3	4				50	4	7,900
HLRS 4015-03-060	6		50	4	7,900				
HLRS 4015-03-080	8		50	4	8,200				
HLRS 4015-03-100	10		50	4	8,200				
HLRS 4015-03-120	12		55	4	8,200				
HLRS 4015-03-160	16		60	4	8,200				
HLRS 4015-05-040	R0.5	4	50	4	7,900				
HLRS 4015-05-060		6	50	4	7,900				
HLRS 4015-05-080		8	50	4	8,200				
HLRS 4015-05-100		10	50	4	8,200				
HLRS 4015-05-120		12	55	4	8,200				
HLRS 4015-05-160		16	60	4	8,200				
HLRS 4018-02-080	1.8	R0.2	8	1.44	1.72	16°	50	4	8,200
HLRS 4018-02-100			10				50	4	8,200
HLRS 4018-02-120			12				55	4	8,200
HLRS 4018-02-140			14				55	4	8,200
HLRS 4018-02-160			16				60	4	8,200
HLRS 4020-005-040	2	R0.05	4	1.6	1.92	16°	50	4	7,900
HLRS 4020-005-060			6				50	4	7,900
HLRS 4020-005-080			8				50	4	8,200
HLRS 4020-005-100			10				50	4	8,200

Square

Long Neck Square

Radius

Long Neck Radius

Ball / Long Shank Ball

Long Neck Ball

Taper Neck Ball

Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $l_1$	Effective Length by Inclined Angles				
				30'	1°	1°30'	2°	3°
HLRS 4010-03-020	1	RO.3	2	2.52	2.69	2.84	2.98	3.24
HLRS 4010-03-030			3	3.59	3.81	3.99	4.16	4.47
HLRS 4010-03-040			4	4.66	4.91	5.12	5.31	5.69
HLRS 4010-03-050			5	5.72	6.00	6.24	6.45	6.91
HLRS 4010-03-060			6	6.78	7.09	7.34	7.59	8.14
HLRS 4010-03-080			8	8.88	9.24	9.54	9.86	10.58
HLRS 4010-03-100			10	10.97	11.37	11.74	12.14	13.03
HLRS 4012-01-040			1.2	RO.1	4	4.12	4.25	4.39
HLRS 4012-01-060	6	6.18			6.38	6.59	6.82	7.33
HLRS 4012-01-100	10	10.30			10.64	10.99	11.38	12.23
HLRS 4012-02-040	RO.2	4			4.11	4.25	4.39	4.54
HLRS 4012-02-060		6		6.18	6.38	6.59	6.82	7.31
HLRS 4012-02-100		10		10.30	10.63	10.99	11.37	12.22
HLRS 4012-03-040	RO.3	4		4.11	4.24	4.38	4.53	4.86
HLRS 4012-03-060		6		6.18	6.38	6.59	6.81	7.31
HLRS 4012-03-100		10		10.30	10.63	10.98	11.36	12.21
HLRS 4015-005-040		RO.05		4	4.12	4.26	4.40	4.55
HLRS 4015-005-060	6		6.18	6.39	6.60	6.83	7.34	
HLRS 4015-005-080	8		8.25	8.52	8.80	9.11	9.79	
HLRS 4015-01-040	RO.1		4	4.12	4.25	4.40	4.55	4.89
HLRS 4015-01-060			6	6.18	6.38	6.60	6.83	7.34
HLRS 4015-01-080			8	8.24	8.51	8.80	9.10	9.78
HLRS 4015-01-100		10	10.31	10.64	11.00	11.38	12.23	
HLRS 4015-01-120		12	12.37	12.77	13.20	13.66	14.68	
HLRS 4015-01-160		16	16.50	17.03	17.60	18.21	19.57	
HLRS 4015-02-040	1.5	RO.2	4	4.12	4.25	4.39	4.54	4.88
HLRS 4015-02-060			6	6.18	6.38	6.59	6.82	7.33
HLRS 4015-02-080			8	8.24	8.51	8.79	9.10	9.77
HLRS 4015-02-100			10	10.31	10.64	10.99	11.37	12.22
HLRS 4015-02-120		12	12.37	12.77	13.19	13.65	14.67	
HLRS 4015-02-160		16	16.49	17.03	17.60	18.21	19.56	
HLRS 4015-03-040		RO.3	4	4.12	4.25	4.39	4.54	4.87
HLRS 4015-03-060			6	6.18	6.38	6.59	6.81	7.31
HLRS 4015-03-080			8	8.24	8.51	8.79	9.09	9.76
HLRS 4015-03-100			10	10.30	10.64	10.99	11.37	12.21
HLRS 4015-03-120	12		12.37	12.77	13.19	13.64	14.66	
HLRS 4015-03-160	16		16.49	17.02	17.59	18.20	19.55	
HLRS 4015-05-040	RO.5	4	4.11	4.24	4.38	4.52	4.85	
HLRS 4015-05-060		6	6.18	6.37	6.58	6.80	7.29	
HLRS 4015-05-080		8	8.24	8.50	8.78	9.08	9.74	
HLRS 4015-05-100		10	10.30	10.63	10.98	11.35	12.19	
HLRS 4015-05-120		12	12.36	12.76	13.18	13.63	14.64	
HLRS 4015-05-160		16	16.49	17.02	17.58	18.19	19.53	
HLRS 4018-02-080	1.8	RO.2	8	8.27	8.54	8.82	9.13	9.81
HLRS 4018-02-100			10	10.33	10.67	11.02	11.40	12.25
HLRS 4018-02-120			12	12.40	12.80	13.22	13.68	14.70
HLRS 4018-02-140			14	14.47	14.94	15.44	15.97	17.16
HLRS 4018-02-160			16	16.52	17.06	17.63	18.24	19.60
HLRS 4020-005-040			2	RO.05	4	4.15	4.28	4.43
HLRS 4020-005-060	6	6.21			6.41	6.63	6.86	7.37
HLRS 4020-005-080	8	8.27			8.54	8.83	9.14	9.82
HLRS 4020-005-100	10	10.34			10.67	11.03	11.41	12.27

Square  
Square  
Long Neck Square

Radius  
Radius  
Long Neck Radius

Ball / Long Shank Ball  
Ball  
Long Neck Ball  
Taper Neck Ball

Taper  
Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $\ell_1$	Length of Cut $\ell$	Neck Diameter $\phi d_1$	Shank Taper Angle Bta	Overall Length L	Shank Diameter $\phi d$	Price (¥)
HLRS 4020-01-040	2	R0.1	4	1.6	1.92	16°	50	4	7,900
HLRS 4020-01-060			6				50	4	7,900
HLRS 4020-01-080			8				50	4	8,200
HLRS 4020-01-100			10				50	4	8,200
HLRS 4020-01-120			12				55	4	8,200
HLRS 4020-01-160			16				60	4	8,200
HLRS 4020-01-200			20				60	4	8,200
HLRS 4020-02-040			R0.2				4	50	4
HLRS 4020-02-060		6					50	4	7,900
HLRS 4020-02-080		8					50	4	8,200
HLRS 4020-02-100		10					50	4	8,200
HLRS 4020-02-120		12					55	4	8,200
HLRS 4020-02-160		16					60	4	8,200
HLRS 4020-02-200		20					60	4	8,200
HLRS 4020-03-040		R0.3					4	50	4
HLRS 4020-03-060			6				50	4	7,900
HLRS 4020-03-080			8				50	4	8,200
HLRS 4020-03-100			10				50	4	8,200
HLRS 4020-03-120			12				55	4	8,200
HLRS 4020-03-160			16				60	4	8,200
HLRS 4020-03-200	20		60	4	8,200				
HLRS 4020-05-040	R0.5		4	50	4	7,900			
HLRS 4020-05-060		6	50	4	7,900				
HLRS 4020-05-080		8	50	4	8,200				
HLRS 4020-05-100		10	50	4	8,200				
HLRS 4020-05-120		12	55	4	8,200				
HLRS 4020-05-160		16	60	4	8,200				
HLRS 4020-05-200		20	60	4	8,200				
HLRS 4025-01-060		2.5	R0.1	6	2	2.42	16°	50	4
HLRS 4025-01-080	8			50				4	8,600
HLRS 4025-01-100	10			50				4	8,600
HLRS 4025-01-160	16			60				4	8,900
HLRS 4025-01-200	20			60				4	8,900
HLRS 4025-01-300	30			70				4	9,200
HLRS 4025-02-060	R0.2		6	50				4	8,600
HLRS 4025-02-080			8	50				4	8,600
HLRS 4025-02-100			10	50				4	8,600
HLRS 4025-02-160			16	60				4	8,900
HLRS 4025-02-200			20	60				4	8,900
HLRS 4025-02-300			30	70				4	9,200
HLRS 4025-03-060	R0.3		6	50				4	8,600
HLRS 4025-03-080			8	50				4	8,600
HLRS 4025-03-100			10	50				4	8,600
HLRS 4025-03-160			16	60				4	8,900
HLRS 4025-03-200			20	60				4	8,900
HLRS 4025-03-300			30	70				4	9,200
HLRS 4025-05-060	R0.5		6	50				4	8,600
HLRS 4025-05-080			8	50				4	8,600
HLRS 4025-05-100		10	50	4	8,600				
HLRS 4025-05-160		16	60	4	8,900				
HLRS 4025-05-200		20	60	4	8,900				
HLRS 4025-05-300		30	70	4	9,200				

Square

Long Neck Square

Radius

Long Neck Radius

Ball / Long Shank Ball

Long Neck Ball

Taper Neck Ball

Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $l_1$	Effective Length by Inclined Angles					
				30°	1°	1°30'	2°	3°	
HLRS 4020-01-040	2	RO.1	4	4.16	4.29	4.43	4.59	4.93	
HLRS 4020-01-060			6	6.22	6.42	6.64	6.87	7.38	
HLRS 4020-01-080			8	8.28	8.55	8.84	9.14	9.83	
HLRS 4020-01-100			10	10.34	10.68	11.04	11.42	12.27	
HLRS 4020-01-120			12	12.41	12.81	13.24	13.70	14.72	
HLRS 4020-01-160			16	16.53	17.07	17.64	18.25	No Interference	
HLRS 4020-01-200			20	20.66	21.33	22.04	22.81	No Interference	
HLRS 4020-02-040			RO.2	4	4.15	4.29	4.43	4.58	4.92
HLRS 4020-02-060		6		6.22	6.42	6.63	6.86	7.37	
HLRS 4020-02-080		8		8.28	8.55	8.83	9.14	9.82	
HLRS 4020-02-100		10		10.34	10.68	11.03	11.41	12.26	
HLRS 4020-02-120		12		12.40	12.81	13.23	13.69	14.71	
HLRS 4020-02-160		16		16.53	17.06	17.64	18.25	No Interference	
HLRS 4020-02-200		20		20.66	21.32	22.04	22.80	No Interference	
HLRS 4020-03-040		RO.3		4	4.15	4.28	4.42	4.57	4.91
HLRS 4020-03-060			6	6.21	6.41	6.63	6.85	7.36	
HLRS 4020-03-080			8	8.28	8.54	8.83	9.13	9.80	
HLRS 4020-03-100			10	10.34	10.67	11.03	11.41	12.25	
HLRS 4020-03-120			12	12.40	12.80	13.23	13.68	14.70	
HLRS 4020-03-160			16	16.53	17.06	17.63	18.24	19.59	
HLRS 4020-03-200			20	20.65	21.32	22.03	22.79	No Interference	
HLRS 4020-05-040			RO.5	4	4.15	4.28	4.41	4.56	4.89
HLRS 4020-05-060		6		6.21	6.41	6.62	6.84	7.34	
HLRS 4020-05-080		8		8.27	8.54	8.82	9.12	9.78	
HLRS 4020-05-100		10		10.34	10.67	11.02	11.39	12.23	
HLRS 4020-05-120		12		12.40	12.80	13.22	13.67	14.68	
HLRS 4020-05-160		16		16.53	17.06	17.62	18.23	19.57	
HLRS 4020-05-200		20		20.65	21.31	22.02	22.78	No Interference	
HLRS 4025-01-060	2.5	RO.1		6	6.21	6.41	6.63	6.86	7.37
HLRS 4025-01-080			8	8.27	8.54	8.83	9.13	9.82	
HLRS 4025-01-100			10	10.34	10.68	11.04	11.42	12.27	
HLRS 4025-01-160			16	16.52	17.06	17.63	18.24	No Interference	
HLRS 4025-01-200			20	20.66	21.33	22.04	No Interference	No Interference	
HLRS 4025-01-300			30	30.97	31.98	No Interference	No Interference	No Interference	
HLRS 4025-02-060			RO.2	6	6.21	6.41	6.62	6.85	7.36
HLRS 4025-02-080				8	8.27	8.54	8.82	9.13	9.81
HLRS 4025-02-100		10		10.34	10.68	11.03	11.41	12.26	
HLRS 4025-02-160		16		16.52	17.06	17.63	18.24	No Interference	
HLRS 4025-02-200		20		20.66	21.32	22.04	No Interference	No Interference	
HLRS 4025-02-300		30		30.97	31.97	No Interference	No Interference	No Interference	
HLRS 4025-03-060		RO.3		6	6.21	6.40	6.62	6.84	7.35
HLRS 4025-03-080				8	8.27	8.53	8.82	9.12	9.80
HLRS 4025-03-100			10	10.34	10.67	11.03	11.41	12.25	
HLRS 4025-03-160			16	16.52	17.05	17.62	18.23	No Interference	
HLRS 4025-03-200			20	20.65	21.32	22.03	No Interference	No Interference	
HLRS 4025-03-300			30	30.97	31.97	No Interference	No Interference	No Interference	
HLRS 4025-05-060			RO.5	6	6.20	6.40	6.61	6.83	7.33
HLRS 4025-05-080				8	8.27	8.53	8.81	9.11	9.77
HLRS 4025-05-100		10		10.34	10.67	11.02	11.39	12.23	
HLRS 4025-05-160		16		16.52	17.05	17.61	18.22	No Interference	
HLRS 4025-05-200		20		20.65	21.31	22.02	No Interference	No Interference	
HLRS 4025-05-300		30		30.97	31.96	No Interference	No Interference	No Interference	

Square

Square  
Long Neck  
Square

Radius

Radius  
Long Neck  
RadiusBall / Long  
Shank BallBall  
Long Neck  
BallTaper Neck  
Ball

Taper

Spiral  
V CutterDrill  
Thread Mill

EURO Series

Technical Data

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $l_1$	Length of Cut $l$	Neck Diameter $\phi d_1$	Shank Taper Angle Bta	Overall Length L	Shank Diameter $\phi d$	Price (¥)
HLRS 4030-005-040	3	R0.05	4	2.4	2.92	16°	55	6	7,100
HLRS 4030-005-060			6				55	6	7,100
HLRS 4030-005-080			8				55	6	7,100
HLRS 4030-005-100			10				55	6	7,100
HLRS 4030-01-040		R0.1	4				55	6	7,100
HLRS 4030-01-060			6				55	6	7,100
HLRS 4030-01-100			10				55	6	7,100
HLRS 4030-01-120			12				55	6	8,600
HLRS 4030-01-160			16				60	6	10,600
HLRS 4030-01-200			20				60	6	10,600
HLRS 4030-01-300		R0.2	30				70	6	12,000
HLRS 4030-02-040			4				55	6	7,100
HLRS 4030-02-060			6				55	6	7,100
HLRS 4030-02-100			10				55	6	7,100
HLRS 4030-02-120			12				55	6	8,600
HLRS 4030-02-160			16				60	6	10,600
HLRS 4030-02-200		20	60				6	10,600	
HLRS 4030-02-300		30	70				6	12,000	
HLRS 4030-03-040		R0.3	4				55	6	7,100
HLRS 4030-03-060			6				55	6	7,100
HLRS 4030-03-100			10				55	6	7,100
HLRS 4030-03-120			12				55	6	8,600
HLRS 4030-03-140			14				55	6	8,600
HLRS 4030-03-160			16				60	6	10,600
HLRS 4030-03-200		20	60				6	10,600	
HLRS 4030-03-300		30	70				6	12,000	
HLRS 4030-05-040		R0.5	4				55	6	7,100
HLRS 4030-05-060			6				55	6	7,100
HLRS 4030-05-100			10				55	6	7,100
HLRS 4030-05-120			12				55	6	8,600
HLRS 4030-05-160			16				60	6	10,600
HLRS 4030-05-200			20				60	6	10,600
HLRS 4030-05-300	30	70	6	12,000					
HLRS 4030-10-060	R1	6	55	6	7,100				
HLRS 4030-10-100		10	55	6	7,100				
HLRS 4030-10-120		12	55	6	8,600				
HLRS 4030-10-160		16	60	6	10,600				
HLRS 4030-10-200		20	60	6	10,600				
HLRS 4030-10-300		30	70	6	12,000				
HLRS 4040-01-080	4	R0.1	8	3.2	3.82	16°	65	6	10,600
HLRS 4040-01-160			16				65	6	10,600
HLRS 4040-01-240			24				70	6	11,800
HLRS 4040-01-320			32				80	6	11,800
HLRS 4040-02-080		R0.2	8				65	6	10,600
HLRS 4040-02-160			16				65	6	10,600
HLRS 4040-02-240			24				70	6	11,800
HLRS 4040-02-320			32				80	6	11,800

Square

Long Neck Square

Radius

Long Neck Radius

Ball / Long Shank Ball

Long Neck Ball

Taper Neck Ball

Taper

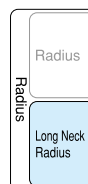
Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $l_1$	Effective Length by Inclined Angles				
				30'	1°	1°30'	2°	3°
HLRS 4030-005-040	3	RO.05	4	4.14	4.28	4.42	4.58	4.92
HLRS 4030-005-060			6	6.21	6.41	6.62	6.86	7.37
HLRS 4030-005-080			8	8.27	8.54	8.83	9.13	9.82
HLRS 4030-005-100			10	10.33	10.67	11.03	11.41	12.26
HLRS 4030-01-040		RO.1	4	4.15	4.29	4.43	4.58	4.93
HLRS 4030-01-060			6	6.21	6.42	6.63	6.86	7.37
HLRS 4030-01-100			10	10.33	10.67	11.02	11.41	12.26
HLRS 4030-01-120			12	12.40	12.81	13.23	13.69	14.72
HLRS 4030-01-160			16	16.53	17.06	17.64	18.25	19.61
HLRS 4030-01-200			20	20.65	21.32	22.04	22.80	24.51
HLRS 4030-01-300		30	30.97	31.97	33.04	34.19	No Interference	
HLRS 4030-02-040		RO.2	4	4.15	4.28	4.43	4.58	4.92
HLRS 4030-02-060			6	6.21	6.41	6.63	6.85	7.36
HLRS 4030-02-100			10	10.33	10.66	11.02	11.40	12.25
HLRS 4030-02-120			12	12.40	12.80	13.23	13.69	14.71
HLRS 4030-02-160			16	16.53	17.06	17.63	18.24	19.60
HLRS 4030-02-200			20	20.65	21.32	22.03	22.80	24.49
HLRS 4030-02-300		30	30.97	31.97	33.04	34.18	No Interference	
HLRS 4030-03-040		RO.3	4	4.15	4.28	4.42	4.57	4.91
HLRS 4030-03-060			6	6.21	6.41	6.62	6.85	7.35
HLRS 4030-03-100			10	10.33	10.66	11.01	11.39	12.24
HLRS 4030-03-120			12	12.40	12.80	13.22	13.68	14.70
HLRS 4030-03-140			14	14.46	14.93	15.43	15.96	17.14
HLRS 4030-03-160			16	16.53	17.06	17.63	18.23	19.59
HLRS 4030-03-200			20	20.65	21.32	22.03	22.79	24.48
HLRS 4030-03-300			30	30.96	31.97	33.03	34.18	No Interference
HLRS 4030-05-040		RO.5	4	4.15	4.27	4.41	4.56	4.88
HLRS 4030-05-060			6	6.21	6.40	6.61	6.83	7.33
HLRS 4030-05-100			10	10.32	10.65	11.00	11.38	12.22
HLRS 4030-05-120			12	12.40	12.79	13.21	13.67	14.67
HLRS 4030-05-160			16	16.52	17.05	17.62	18.22	19.57
HLRS 4030-05-200			20	20.65	21.31	22.02	22.78	24.46
HLRS 4030-05-300	30	30.96	31.96	33.02	34.16	No Interference		
HLRS 4030-10-060	R1	6	6.20	6.39	6.59	6.80	7.28	
HLRS 4030-10-100		10	10.32	10.64	10.98	11.35	12.16	
HLRS 4030-10-120		12	12.39	12.78	13.19	13.63	14.62	
HLRS 4030-10-160		16	16.51	17.04	17.59	18.19	19.52	
HLRS 4030-10-200		20	20.64	21.29	21.99	22.74	24.41	
HLRS 4030-10-300	30	30.95	31.94	33.00	34.13	No Interference		
HLRS 4040-01-080	4	RO.1	8	8.45	8.73	9.02	9.33	10.03
HLRS 4040-01-160			16	16.70	17.25	17.82	18.44	No Interference
HLRS 4040-01-240			24	24.95	25.76	26.63	27.55	No Interference
HLRS 4040-01-320			32	33.21	34.28	35.43	No Interference	No Interference
HLRS 4040-02-080		RO.2	8	8.45	8.72	9.01	9.33	10.02
HLRS 4040-02-160			16	16.70	17.24	17.82	18.44	No Interference
HLRS 4040-02-240			24	24.95	25.76	26.62	27.54	No Interference
HLRS 4040-02-320			32	33.20	34.28	35.43	No Interference	No Interference





Unit (mm)

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $\ell_1$	Length of Cut $\ell$	Neck Diameter $\phi d_1$	Shank Taper Angle $\beta$	Overall Length L	Shank Diameter $\phi d$	Price (¥)	
HLRS 4040-03-080	4	R0.3	8	3.2	3.82	16°	65	6	10,600	
HLRS 4040-03-140			14				65	6	10,600	
HLRS 4040-03-160			16				65	6	10,600	
HLRS 4040-03-240			24				70	6	11,800	
HLRS 4040-03-320			32				80	6	11,800	
HLRS 4040-05-080			R0.5				8	65	6	10,600
HLRS 4040-05-160		16					65	6	10,600	
HLRS 4040-05-240		24					70	6	11,800	
HLRS 4040-05-320		32					80	6	11,800	
HLRS 4040-10-080		R1					8	65	6	10,600
HLRS 4040-10-160							16	65	6	10,600
HLRS 4040-10-240			24				70	6	11,800	
HLRS 4040-10-320	32		80	6	11,800					
HLRS 4060-01-120	6	R0.1	12	4.8	5.82	-	65	6	15,400	
HLRS 4060-01-200			20				70	6	15,400	
HLRS 4060-01-300			30				100	6	18,000	
HLRS 4060-01-480			48				120	6	24,000	
HLRS 4060-02-120		R0.2	12				65	6	15,400	
HLRS 4060-02-200			20				70	6	15,400	
HLRS 4060-02-300			30				100	6	18,000	
HLRS 4060-02-480			48				120	6	24,000	
HLRS 4060-03-120		R0.3	12				65	6	15,400	
HLRS 4060-03-200			20				70	6	15,400	
HLRS 4060-03-300			30				100	6	18,000	
HLRS 4060-03-480			48				120	6	24,000	
HLRS 4060-05-120			R0.5				12	65	6	15,400
HLRS 4060-05-200							20	70	6	15,400
HLRS 4060-05-300		30					100	6	18,000	
HLRS 4060-05-400		40					100	6	18,000	
HLRS 4060-05-480		48					120	6	24,000	
HLRS 4060-10-120		R1					12	65	6	15,400
HLRS 4060-10-200			20				70	6	15,400	
HLRS 4060-10-300			30				100	6	18,000	
HLRS 4060-10-400			40				100	6	18,000	
HLRS 4060-10-480			48				120	6	24,000	

Square  
Long Neck Square

Radius  
Long Neck Radius

Ball / Long Shank Ball

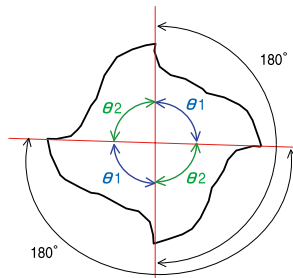
Ball  
Long Neck Ball  
Taper Neck Ball

Taper

Spiral V Cutter  
Drill Thread Mill  
EURO Series  
Technical Data

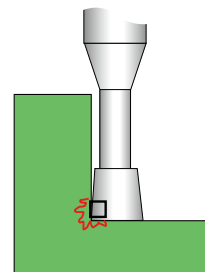
Next Page ➡

## Variable pitch



The unequal division helps control chattering and tip damage.  
Easy to measure outside diameter.

## Back taper geometry



The back taper geometry reduces cutting resistance.

Model Number	Outside Diameter $\phi D$	Corner Radius CR	Effective Length $l_1$	Effective Length by Inclined Angles				
				30'	1°	1°30'	2°	3°
HLRS 4040-03-080	4	R0.3	8	8.45	8.72	9.01	9.32	10.01
HLRS 4040-03-140			14	14.64	15.11	15.62	16.16	17.36
HLRS 4040-03-160			16	16.70	17.24	17.81	18.43	No Interference
HLRS 4040-03-240			24	24.95	25.76	26.62	27.54	No Interference
HLRS 4040-03-320			32	33.20	34.28	35.42	No Interference	No Interference
HLRS 4040-05-080			8	8.45	8.71	9.00	9.31	9.99
HLRS 4040-05-160		R0.5	16	16.70	17.23	17.80	18.42	No Interference
HLRS 4040-05-240			24	24.95	25.75	26.61	27.52	No Interference
HLRS 4040-05-320			32	33.20	34.27	35.41	No Interference	No Interference
HLRS 4040-10-080		R1	8	8.44	8.70	8.98	9.27	9.93
HLRS 4040-10-160			16	16.69	17.22	17.78	18.38	19.72
HLRS 4040-10-240			24	24.94	25.74	26.58	27.49	No Interference
HLRS 4040-10-320	32		33.19	34.25	35.39	No Interference	No Interference	
HLRS 4060-01-120	6	R0.1	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-01-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-01-300			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-01-480			48	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-02-120		R0.2	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-02-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-02-300			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-02-480		48	No Interference	No Interference	No Interference	No Interference	No Interference	
HLRS 4060-03-120		R0.3	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-03-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-03-300			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-03-480		48	No Interference	No Interference	No Interference	No Interference	No Interference	
HLRS 4060-05-120		R0.5	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-05-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-05-300			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-05-400			40	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-05-480		48	No Interference	No Interference	No Interference	No Interference	No Interference	
HLRS 4060-10-120		R1	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-10-200			20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-10-300			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-10-400			40	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 4060-10-480		48	No Interference	No Interference	No Interference	No Interference	No Interference	

Square

Square

Long Neck Square

Radius

Radius

Long Neck Radius

Ball / Long Shank Ball

Ball

Long Neck Ball

Taper Neck Ball

Taper

Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

Technical Data

EURO Series

Technical Data

Technical Data

Technical Data

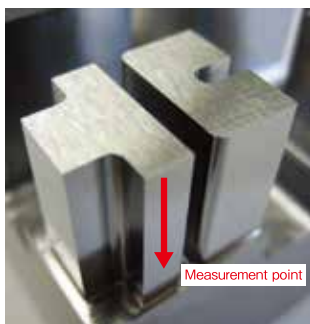
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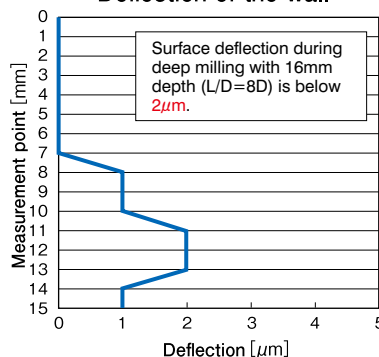
Technical Data

Technical Data

$L/D = 8D$  Milling Example for Slotting: DAC10(48HRC) HLRS4020-03-160 ( $\phi 2 \times CR0.3 \times 16\text{mm}$  Effective Length)



Deflection of the wall



Spindle Speed	7,300( $\text{min}^{-1}$ )
Feed Rate	1,260( $\text{mm}/\text{min}$ )
Axial Depth $a_p$	0.02( $\text{mm}$ )
Radial Depth $a_e$	0.015( $\text{min}$ )
Cycle Time	112 minutes
Coolant	Oil Mist
Work Material Size	20×15( $\text{mm}$ )

Milling Conditions for HLRS (4 Flutes)

WORK MATERIAL				PREHARDENED STEELS HARDENED STEELS NAK / SKD (30~45HRC)				HARDENED STEELS SKD / SKT (45~55HRC)				HARDENED STEELS SKD / SKH (55~65HRC)			
Model Number	Outside Diameter (mm)	Effective Length (mm)	L/D	Spindle Speed (min <sup>-1</sup> )	Feed Rate (mm/min)	a <sub>p</sub> Axial Depth (mm)	a <sub>e</sub> Radial Depth (mm)	Spindle Speed (min <sup>-1</sup> )	Feed Rate (mm/min)	a <sub>p</sub> Axial Depth (mm)	a <sub>e</sub> Radial Depth (mm)	Spindle Speed (min <sup>-1</sup> )	Feed Rate (mm/min)	a <sub>p</sub> Axial Depth (mm)	a <sub>e</sub> Radial Depth (mm)
4008	0.8	2	2.5	20,000	1,100	0.025	0.2	18,500	950	0.02	0.2	10,000	280	0.005	0.12
		3	3.75	18,800	950	0.021	0.2	16,500	830	0.018	0.2	9,200	200	0.005	0.116
		4	5	17,500	840	0.018	0.2	15,000	730	0.016	0.2	8,800	120	0.004	0.112
		6	7.5	14,600	700	0.015	0.2	12,500	600	0.015	0.2	8,500	60	0.004	0.108
4010	1	2	2	17,600	1,470	0.056	0.270	15,300	1,200	0.038	0.270	10,900	710	0.030	0.270
		3	3	15,500	1,390	0.048	0.270	13,200	1,150	0.037	0.270	9,400	680	0.027	0.270
		4	4	13,800	1,310	0.039	0.270	12,000	1,070	0.031	0.243	8,500	640	0.015	0.243
		5	5	12,500	1,150	0.030	0.240	11,000	960	0.027	0.232	7,800	570	0.013	0.144
		6	6	11,300	1,040	0.021	0.216	9,800	860	0.016	0.209	7,000	510	0.010	0.108
		8	8	9,800	780	0.020	0.189	8,500	720	0.012	0.160	6,100	420	0.008	0.094
		10	10	8,800	510	0.011	0.126	7,600	510	0.009	0.100	5,400	350	0.006	0.050
4012	1.2	4	3.3	13,200	1,360	0.032	0.450	11,900	1,100	0.024	0.300	9,200	1,300	0.020	0.200
		6	5	11,200	1,160	0.028	0.360	9,600	980	0.022	0.252	7,400	1,200	0.011	0.095
		10	8.3	9,000	800	0.017	0.180	7,300	600	0.009	0.150	6,300	800	0.006	0.050
4015	1.5	4	2.7	13,200	1,360	0.054	0.540	13,200	1,280	0.042	0.495	10,100	700	0.033	0.292
		6	4	11,600	1,280	0.041	0.486	10,600	1,210	0.038	0.445	8,100	460	0.025	0.202
		8	5.3	10,200	1,080	0.037	0.378	9,300	1,020	0.031	0.346	7,100	390	0.015	0.157
		10	6.7	9,300	930	0.032	0.345	8,500	870	0.029	0.316	6,600	340	0.011	0.172
		16	10.7	7,400	670	0.018	0.216	6,800	600	0.014	0.198	5,100	230	0.005	0.108
4018	1.8	8	4.4	10,700	1,120	0.047	0.495	9,800	1,060	0.043	0.497	7,700	500	0.020	0.222
		10	5.6	9,600	1,010	0.040	0.436	8,900	950	0.038	0.421	7,100	390	0.015	0.203
		12	6.7	8,100	850	0.035	0.303	7,500	740	0.032	0.306	5,900	290	0.013	0.159
		14	7.8	7,400	770	0.027	0.240	6,900	660	0.024	0.240	5,400	270	0.008	0.130
		16	8.9	7,200	730	0.021	0.207	6,700	630	0.019	0.198	5,200	260	0.006	0.113
4020	2	4	2	15,300	1,570	0.069	0.720	14,300	1,460	0.065	0.810	11,500	860	0.031	0.360
		6	3	12,800	1,280	0.064	0.648	12,000	1,200	0.060	0.729	9,700	700	0.028	0.324
		8	4	11,200	1,160	0.058	0.612	10,400	1,100	0.055	0.648	8,400	600	0.026	0.288
		10	5	10,000	1,090	0.049	0.526	9,300	1,020	0.047	0.526	7,600	450	0.019	0.234
		12	6	9,100	1,030	0.046	0.405	8,500	960	0.044	0.405	6,900	420	0.018	0.180
4025	2.5	16	8	7,800	860	0.042	0.283	7,300	700	0.039	0.315	5,900	270	0.016	0.157
		20	10	7,000	800	0.025	0.198	6,600	650	0.024	0.198	5,300	290	0.007	0.118
		6	2.4	13,000	1,600	0.078	0.700	12,000	1,500	0.074	0.700	9,900	830	0.050	0.476
		8	3.2	11,300	1,430	0.075	0.620	10,500	1,240	0.072	0.620	9,100	650	0.050	0.420
		10	4	10,500	1,400	0.067	0.540	10,000	1,150	0.067	0.540	8,400	510	0.048	0.324
		16	6.4	8,900	1,400	0.059	0.360	8,500	790	0.049	0.300	7,200	350	0.030	0.150
4030	3	20	8	7,800	1,200	0.048	0.270	7,500	670	0.031	0.225	6,300	300	0.022	0.090
		30	12	6,300	600	0.011	0.180	6,000	500	0.014	0.180	5,000	220	0.010	0.054
		4	1.3	15,000	3,070	0.128	0.720	14,000	2,640	0.080	0.720	11,500	980	0.052	0.576
		6	2	14,000	2,890	0.120	0.720	13,300	2,500	0.075	0.720	10,800	900	0.050	0.576
		8	2.7	12,500	2,530	0.105	0.700	11,800	2,200	0.070	0.700	9,900	810	0.047	0.560
		10	3.3	11,300	2,160	0.096	0.700	10,500	2,090	0.060	0.700	9,000	730	0.045	0.560
		12	4	10,500	2,020	0.084	0.670	10,000	1,950	0.052	0.670	8,100	660	0.037	0.502
		14	4.7	9,700	1,800	0.072	0.650	9,300	1,700	0.044	0.650	7,500	600	0.032	0.430
4040	4	16	5.3	9,200	1,680	0.064	0.630	8,800	1,600	0.040	0.630	7,100	570	0.027	0.378
		20	6.7	8,400	1,540	0.058	0.580	7,900	1,490	0.036	0.580	6,300	550	0.022	0.319
		30	10	7,000	1,260	0.040	0.380	6,500	1,230	0.015	0.380	5,400	390	0.007	0.144
		8	2	10,200	1,480	0.133	1.350	8,500	1,420	0.104	1.350	7,300	810	0.091	0.945
		14	3.5	8,500	1,400	0.100	1.080	7,100	1,350	0.078	1.080	6,000	760	0.051	0.760
		16	4	7,900	1,370	0.091	1.000	6,600	1,330	0.071	1.000	5,600	740	0.043	0.700
4060	6	24	6	6,200	1,200	0.060	0.800	5,200	1,120	0.047	0.800	4,500	630	0.022	0.560
		32	8	5,500	960	0.037	0.648	4,600	920	0.029	0.648	3,900	600	0.011	0.388
		12	2	8,000	2,370	0.200	2.430	4,700	1,360	0.200	1.350	4,000	1,080	0.075	1.350
		20	3.3	5,800	1,730	0.180	2.358	3,500	1,000	0.180	1.310	3,000	760	0.070	1.310
		30	5	4,500	1,290	0.158	2.268	2,600	740	0.158	1.260	2,200	580	0.066	1.260
		40	6.7	3,000	800	0.100	1.350	1,700	480	0.100	0.750	1,400	360	0.040	0.550
		48	8	2,000	510	0.050	0.900	1,200	330	0.040	0.500	1,000	240	0.020	0.300

Square

Long Neck Square

Radius

Long Neck Radius

Ball / Long Shank Ball

Long Neck Ball

Taper Neck Ball

Taper

Spiral V Cutter

Drill Thread Mill

EURO Series

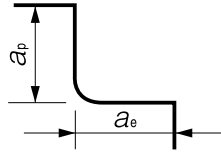
Technical Data

## Milling Conditions for HLRS (4 Flutes)

### Side Milling

$a_p$  : Axial Depth (mm)

$a_e$  : Radial Depth (mm)



### Note:

- Decrease both spindle speed and feed rate proportionally when the milling parameters exceed the machine's maximum spindle speed.
- Every coolant offers stable milling.
- Recommend oil coolant for Stainless Steels and Heat Resistant Alloys.
- Recommend wet coolant for Copper.

Square

Square  
Long Neck  
Square

Radius

Radius  
Long Neck  
RadiusBall / Long  
Shank BallBall  
Long Neck  
BallTaper Neck  
BallTaper  
TaperSpiral  
V CutterDrill  
Thread Mill

EURO Series

Technical Data