Size ϕ0.2～ϕ6

HLRS2000/HLRS2000E

Super MG | HARD MAX | 30° | R | ±0.005 | Shank Dia 0/-0.005

Material Applications (☆ Highly Recommended ◎ Recommended ○ Suggested)

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

Total 351 models

Unit (mm)

Model Number	Excellent	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	Price (¥)
HLRS 2002-005-005E	○	0.2	R0.05	0.5	0.2	0.17	16°	50	4	12,320
HLRS 2002-005-010E	○			1				50	4	12,320
HLRS 2002-005-015E	○			1.5				50	4	12,320
HLRS 2002-005-020E	○			2				50	4	12,320
HLRS 2003-005-010E	○	0.3	R0.05	1	0.3	0.27	16°	50	4	11,870
HLRS 2003-005-015E	○			1.5				50	4	11,870
HLRS 2003-005-020E	○			2				50	4	11,870
HLRS 2003-005-025E	○			2.5				50	4	13,200
HLRS 2003-005-030E	○			3				50	4	13,200
HLRS 2004-005-010E	○	0.4	R0.05	1	0.4	0.38	16°	50	4	7,910
HLRS 2004-005-015E	○			1.5				50	4	7,910
HLRS 2004-005-020E	○			2				50	4	7,910
HLRS 2004-005-030E	○			3				50	4	7,910
HLRS 2004-005-040E	○			4				50	4	7,910
HLRS 2004-01-010			R0.1	1				50	4	7,910
HLRS 2004-01-015				1.5				50	4	7,910
HLRS 2004-01-020				2				50	4	7,910
HLRS 2004-01-030				3				50	4	7,910
HLRS 2004-01-040				4				50	4	7,910
HLRS 2005-005-010		0.5	R0.05	1	0.5	0.48	16°	50	4	6,440
HLRS 2005-005-020				2				50	4	6,440
HLRS 2005-005-030				3				50	4	6,440
HLRS 2005-005-040				4				50	4	6,440
HLRS 2005-005-050				5				50	4	6,440
HLRS 2005-01-010			R0.1	1				50	4	6,440
HLRS 2005-01-020				2				50	4	6,440
HLRS 2005-01-030				3				50	4	6,440
HLRS 2005-01-040				4				50	4	6,440
HLRS 2005-01-050				5				50	4	6,440
HLRS 2005-01-060				6				50	4	6,440

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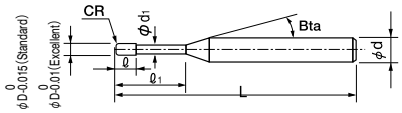
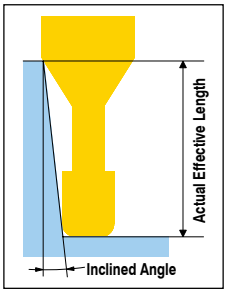
Features

High efficiency and accuracy.
Recommended for various applications from Raw Materials to Hardened Steels.
Suitable for both dry and wet coolant types.
Refer to page 190 for 4 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.



	Diameter Tolerance	Corner Radius Tolerance
Standard Tolerance Type	0/-0.015	Nominal Radius ± 0.005
Excellent Tolerance Type	0/-0.01	Nominal Radius ± 0.005

Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Effective Length by Inclined Angles				
					30′	1°	1°30′	2°	3°
HLRS 2002-005-005E	○	0.2	R0.05	0.5	0.67	0.71	0.75	0.78	0.85
HLRS 2002-005-010E	○			1	1.20	1.26	1.31	1.36	1.45
HLRS 2002-005-015E	○			1.5	1.72	1.80	1.87	1.92	2.03
HLRS 2002-005-020E	○			2	2.25	2.34	2.41	2.48	2.59
HLRS 2003-005-010E	○	0.3	R0.05	1	1.24	1.31	1.38	1.44	1.55
HLRS 2003-005-015E	○			1.5	1.72	1.83	1.91	1.99	2.12
HLRS 2003-005-020E	○			2	2.26	2.37	2.47	2.55	2.70
HLRS 2003-005-025E	○			2.5	2.78	2.91	3.02	3.11	3.27
HLRS 2003-005-030E	○			3	3.31	3.45	3.57	3.66	3.83
HLRS 2004-005-010E	○	0.4	R0.05	1	1.31	1.40	1.49	1.57	1.72
HLRS 2004-005-015E	○			1.5	1.79	1.92	2.03	2.13	2.31
HLRS 2004-005-020E	○			2	2.33	2.48	2.60	2.71	2.90
HLRS 2004-005-030E	○			3	3.40	3.58	3.72	3.85	4.07
HLRS 2004-005-040E	○			4	4.45	4.66	4.82	4.97	5.21
HLRS 2004-01-010			R0.1	1	1.28	1.38	1.46	1.55	1.69
HLRS 2004-01-015				1.5	1.76	1.90	2.01	2.11	2.28
HLRS 2004-01-020				2	2.30	2.46	2.58	2.69	2.89
HLRS 2004-01-030				3	3.38	3.56	3.71	3.83	4.06
HLRS 2004-01-040				4	4.44	4.64	4.81	4.95	5.20
HLRS 2005-005-010		0.5	R0.05	1	1.34	1.46	1.57	1.67	1.86
HLRS 2005-005-020				2	2.37	2.55	2.71	2.84	3.08
HLRS 2005-005-030				3	3.45	3.67	3.85	4.00	4.27
HLRS 2005-005-040				4	4.52	4.77	4.97	5.14	5.44
HLRS 2005-005-050				5	5.58	5.85	6.07	6.26	6.58
HLRS 2005-01-010			R0.1	1	1.34	1.45	1.56	1.66	1.85
HLRS 2005-01-020				2	2.37	2.55	2.70	2.83	3.07
HLRS 2005-01-030				3	3.45	3.67	3.84	4.00	4.26
HLRS 2005-01-040				4	4.52	4.76	4.96	5.13	5.43
HLRS 2005-01-050				5	5.58	5.85	6.07	6.25	6.57
HLRS 2005-01-060				6	6.63	6.93	7.16	7.36	7.70

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Price (¥)
HLRS 2006-005-020		0.6	R0.05	2	0.6	0.58	16°	50	4	6,440
HLRS 2006-005-030				3				50	4	6,440
HLRS 2006-005-040				4				50	4	6,440
HLRS 2006-005-060				6				50	4	6,440
HLRS 2006-005-080				8				50	4	6,440
HLRS 2006-01-020			R0.1	2				50	4	6,440
HLRS 2006-01-020E	○			2				50	4	7,080
HLRS 2006-01-030				3				50	4	6,440
HLRS 2006-01-030E	○			3				50	4	7,080
HLRS 2006-01-040				4				50	4	6,440
HLRS 2006-01-040E	○			4				50	4	7,080
HLRS 2006-01-060				6				50	4	6,440
HLRS 2006-01-080				8				50	4	6,440
HLRS 2006-02-020			R0.2	2				50	4	6,440
HLRS 2006-02-030				3				50	4	6,440
HLRS 2006-02-040				4				50	4	6,440
HLRS 2006-02-060				6				50	4	6,440
HLRS 2006-02-080				8				50	4	6,440
HLRS 2007-01-040		0.7	R0.1	4	0.7	0.68	16°	50	4	6,780
HLRS 2007-01-060				6				50	4	6,780
HLRS 2008-005-040		0.8	R0.05	4	0.8	0.78	16°	50	4	7,340
HLRS 2008-005-060				6				50	4	7,340
HLRS 2008-005-080				8				50	4	7,340
HLRS 2008-01-040			R0.1	4				50	4	7,340
HLRS 2008-01-060				6				50	4	7,340
HLRS 2008-01-080				8				50	4	7,340
HLRS 2008-02-040			R0.2	4				50	4	7,340
HLRS 2008-02-060				6				50	4	7,340
HLRS 2008-02-080				8				50	4	7,340
HLRS 2010-005-020		1	R0.05	2	1	0.95	16°	50	4	6,240
HLRS 2010-005-030				3				50	4	6,240
HLRS 2010-005-040				4				50	4	6,240
HLRS 2010-005-050				5				50	4	6,240
HLRS 2010-005-060				6				50	4	6,780
HLRS 2010-005-080				8				50	4	6,780
HLRS 2010-005-100				10				50	4	6,780
HLRS 2010-005-120				12				55	4	6,780
HLRS 2010-005-160				16				60	4	8,990
HLRS 2010-005-200				20				60	4	9,980
HLRS 2010-01-020			R0.1	2				50	4	6,240
HLRS 2010-01-020E	○			2				50	4	6,860
HLRS 2010-01-030				3				50	4	6,240
HLRS 2010-01-040				4				50	4	6,240
HLRS 2010-01-040E	○			4				50	4	6,860
HLRS 2010-01-050				5				50	4	6,240
HLRS 2010-01-060				6				50	4	6,780
HLRS 2010-01-060E	○			6				50	4	7,460

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Effective Length by Inclined Angles				
					30′	1°	1°30′	2°	3°
HLRS 2006-005-020		0.6	R0.05	2	2.38	2.61	2.79	2.95	3.22
HLRS 2006-005-030				3	3.48	3.74	3.95	4.13	4.30
HLRS 2006-005-040				4	4.56	4.85	5.08	5.28	5.67
HLRS 2006-005-060				6	6.68	7.03	7.30	7.55	8.12
HLRS 2006-005-080				8	8.79	9.18	9.50	9.83	10.56
HLRS 2006-01-020			R0.1	2	2.37	2.60	2.78	2.93	3.20
HLRS 2006-01-020E	○			2	2.37	2.60	2.78	2.93	3.20
HLRS 2006-01-030				3	3.47	3.73	3.94	4.11	4.28
HLRS 2006-01-030E	○			3	3.47	3.73	3.94	4.11	4.28
HLRS 2006-01-040				4	4.55	4.84	5.07	5.26	5.65
HLRS 2006-01-040E	○			4	4.55	4.84	5.07	5.26	5.65
HLRS 2006-01-060				6	6.68	7.03	7.30	7.54	8.10
HLRS 2006-01-080				8	8.79	9.18	9.50	9.82	10.55
HLRS 2006-02-020			R0.2	2	2.34	2.56	2.74	2.90	3.18
HLRS 2006-02-030				3	3.44	3.70	3.91	4.09	4.41
HLRS 2006-02-040				4	4.53	4.82	5.05	5.23	5.61
HLRS 2006-02-060				6	6.66	7.01	7.28	7.51	8.06
HLRS 2006-02-080				8	8.79	9.17	9.48	9.81	10.53
HLRS 2007-01-040		0.7	R0.1	4	4.55	4.84	5.07	5.26	5.65
HLRS 2007-01-060				6	6.68	7.03	7.30	7.54	8.10
HLRS 2008-005-040		0.8	R0.05	4	4.56	4.85	5.08	5.28	5.67
HLRS 2008-005-060				6	6.68	7.03	7.30	7.55	8.12
HLRS 2008-005-080				8	8.79	9.18	9.50	9.83	10.56
HLRS 2008-01-040			R0.1	4	4.55	4.84	5.07	5.26	5.65
HLRS 2008-01-060				6	6.68	7.03	7.30	7.54	8.10
HLRS 2008-01-080				8	8.79	9.18	9.50	9.82	10.55
HLRS 2008-02-040			R0.2	4	4.53	4.82	5.05	5.23	5.61
HLRS 2008-02-060				6	6.66	7.01	7.28	7.51	8.06
HLRS 2008-02-080				8	8.79	9.17	9.48	9.81	10.53
HLRS 2010-005-020		1	R0.05	2	2.51	2.86	2.70	3.01	3.28
HLRS 2010-005-030				3	3.59	3.82	4.01	4.18	4.51
HLRS 2010-005-040				4	4.72	4.92	5.14	5.33	5.73
HLRS 2010-005-050				5	5.72	6.01	6.25	6.47	6.95
HLRS 2010-005-060				6	6.77	7.09	7.35	7.61	8.18
HLRS 2010-005-080				8	8.87	9.24	9.55	9.88	10.62
HLRS 2010-005-100				10	10.97	11.37	11.75	12.16	13.07
HLRS 2010-005-120				12	13.05	13.50	13.96	14.44	15.52
HLRS 2010-005-160				16	17.20	17.76	18.36	18.99	20.41
HLRS 2010-005-200				20	21.33	22.02	22.76	23.55	25.31
HLRS 2010-01-020			R0.1	2	2.53	2.71	2.88	3.01	3.27
HLRS 2010-01-020E	○			2	2.53	2.71	2.88	3.01	3.27
HLRS 2010-01-030				3	3.58	3.81	4.00	4.18	4.49
HLRS 2010-01-040				4	4.67	4.93	5.14	5.33	5.72
HLRS 2010-01-040E	○			4	4.67	4.93	5.14	5.33	5.72
HLRS 2010-01-050				5	5.71	6.00	6.24	6.46	6.94
HLRS 2010-01-060				6	6.78	7.10	7.36	7.60	8.17
HLRS 2010-01-060E	○			6	6.78	7.10	7.36	7.60	8.17

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Price (¥)
HLRS 2010-01-080		1	R0.1	8	1	0.95	16°	50	4	6,780
HLRS 2010-01-100				10				50	4	6,780
HLRS 2010-01-120				12				55	4	6,780
HLRS 2010-01-160				16				60	4	8,990
HLRS 2010-01-200				20				60	4	9,980
HLRS 2010-02-020			R0.2	2				50	4	6,240
HLRS 2010-02-020E	○			2				50	4	6,860
HLRS 2010-02-030				3				50	4	6,240
HLRS 2010-02-040				4				50	4	6,240
HLRS 2010-02-040E	○			4				50	4	6,860
HLRS 2010-02-050				5				50	4	6,240
HLRS 2010-02-060				6				50	4	6,780
HLRS 2010-02-060E	○			6				50	4	7,460
HLRS 2010-02-080				8				50	4	6,780
HLRS 2010-02-100				10				50	4	6,780
HLRS 2010-02-120				12				55	4	6,780
HLRS 2010-02-160				16				60	4	8,990
HLRS 2010-02-200				20				60	4	9,980
HLRS 2010-03-020			R0.3	2				50	4	6,240
HLRS 2010-03-020E	○			2				50	4	6,860
HLRS 2010-03-030				3				50	4	6,240
HLRS 2010-03-040				4				50	4	6,240
HLRS 2010-03-040E	○			4				50	4	6,860
HLRS 2010-03-050				5				50	4	6,240
HLRS 2010-03-060				6				50	4	6,780
HLRS 2010-03-060E	○			6				50	4	7,460
HLRS 2010-03-080				8				50	4	6,780
HLRS 2010-03-100				10				50	4	6,780
HLRS 2010-03-120				12				55	4	6,780
HLRS 2010-03-160				16				60	4	8,990
HLRS 2010-03-200				20				60	4	9,980
HLRS 2012-02-060		1.2	R0.2	6	1.2	1.14	16°	50	4	7,000
HLRS 2012-02-120				12				55	4	7,000
HLRS 2012-02-200				20				60	4	10,620
HLRS 2012-03-060			R0.3	6				50	4	7,000
HLRS 2012-03-120				12				55	4	7,000
HLRS 2012-03-200				20				60	4	10,620
HLRS 2015-005-040		1.5	R0.05	4	1.5	1.45	16°	50	4	6,650
HLRS 2015-005-060				6				50	4	6,650
HLRS 2015-005-080				8				50	4	7,000
HLRS 2015-005-100				10				50	4	7,000
HLRS 2015-01-040			R0.1	4				50	4	6,650
HLRS 2015-01-060				6				50	4	6,650
HLRS 2015-01-080				8				50	4	7,000
HLRS 2015-01-100				10				50	4	7,000
HLRS 2015-01-120				12				55	4	7,000
HLRS 2015-01-160				16				55	4	7,000
HLRS 2015-01-200				20				60	4	7,000

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

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Effective Length by Inclined Angles				
					30′	1°	1°30′	2°	3°
HLRS 2010-01-080		1	R0.1	8	8.88	9.24	9.56	9.88	10.61
HLRS 2010-01-100				10	10.97	11.37	11.76	12.16	13.06
HLRS 2010-01-120				12	13.05	13.50	13.96	14.44	15.51
HLRS 2010-01-160				16	17.20	17.76	18.36	18.99	20.40
HLRS 2010-01-200				20	21.33	22.02	22.76	23.54	25.30
HLRS 2010-02-020			R0.2	2	2.51	2.69	2.86	2.98	3.23
HLRS 2010-02-020E	○			2	2.51	2.69	2.86	2.98	3.23
HLRS 2010-02-030				3	3.58	3.80	3.99	4.16	4.47
HLRS 2010-02-040				4	4.65	4.91	5.12	5.30	5.68
HLRS 2010-02-040E	○			4	4.65	4.91	5.12	5.30	5.68
HLRS 2010-02-050				5	5.71	6.00	6.23	6.45	6.92
HLRS 2010-02-060				6	6.76	7.08	7.34	7.57	8.13
HLRS 2010-02-060E	○			6	6.76	7.08	7.34	7.57	8.13
HLRS 2010-02-080				8	8.86	9.22	9.54	9.85	10.57
HLRS 2010-02-100				10	10.95	11.35	11.74	12.13	13.02
HLRS 2010-02-120				12	13.03	13.48	13.94	14.41	15.47
HLRS 2010-02-160				16	17.18	17.74	18.34	18.96	20.36
HLRS 2010-02-200				20	21.31	22.00	22.74	23.51	25.26
HLRS 2010-03-020			R0.3	2	2.49	2.67	2.84	2.95	3.19
HLRS 2010-03-020E	○			2	2.49	2.67	2.84	2.95	3.19
HLRS 2010-03-030				3	3.57	3.79	3.98	4.14	4.45
HLRS 2010-03-040				4	4.63	4.89	5.10	5.27	5.64
HLRS 2010-03-040E	○			4	4.63	4.89	5.10	5.27	5.64
HLRS 2010-03-050				5	5.70	5.99	6.22	6.43	6.90
HLRS 2010-03-060				6	6.74	7.06	7.32	7.54	8.09
HLRS 2010-03-060E	○			6	6.74	7.06	7.32	7.54	8.09
HLRS 2010-03-080				8	8.84	9.20	9.52	9.82	10.53
HLRS 2010-03-100				10	10.93	11.33	11.72	12.10	12.98
HLRS 2010-03-120				12	13.01	13.46	13.92	14.38	15.43
HLRS 2010-03-160				16	17.16	17.72	18.32	18.93	20.32
HLRS 2010-03-200				20	21.29	21.98	22.72	23.48	25.22
HLRS 2012-02-060		1.2	R0.2	6	6.18	6.38	6.59	6.82	7.33
HLRS 2012-02-120				12	12.37	12.77	13.19	13.65	14.67
HLRS 2012-02-200				20	20.62	21.29	22.00	22.76	24.46
HLRS 2012-03-060			R0.3	6	6.18	6.38	6.59	6.81	7.31
HLRS 2012-03-120				12	12.37	12.77	13.19	13.64	14.66
HLRS 2012-03-200				20	20.62	21.28	21.99	22.75	24.45
HLRS 2015-005-040		1.5	R0.05	4	4.12	4.26	4.40	4.55	4.89
HLRS 2015-005-060				6	6.18	6.39	6.60	6.83	7.34
HLRS 2015-005-080				8	8.25	8.52	8.80	9.11	9.79
HLRS 2015-005-100				10	10.31	10.64	11.00	11.38	12.24
HLRS 2015-01-040			R0.1	4	4.12	4.25	4.40	4.55	4.89
HLRS 2015-01-060				6	6.18	6.38	6.60	6.83	7.34
HLRS 2015-01-080				8	8.24	8.51	8.80	9.10	9.78
HLRS 2015-01-100				10	10.31	10.64	11.00	11.38	12.23
HLRS 2015-01-120				12	12.37	12.77	13.20	13.66	14.68
HLRS 2015-01-160				16	16.50	17.03	17.60	18.21	19.57
HLRS 2015-01-200				20	20.62	21.29	22.00	22.77	No Interference

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Price (¥)
HLRS 2015-02-040		1.5	R0.2	4	1.5	1.45	16°	50	4	6,650
HLRS 2015-02-060				6				50	4	6,650
HLRS 2015-02-080				8				50	4	7,000
HLRS 2015-02-100				10				50	4	7,000
HLRS 2015-02-120				12				55	4	7,000
HLRS 2015-02-160				16				55	4	7,000
HLRS 2015-02-200				20				60	4	7,000
HLRS 2015-03-040			R0.3	4				50	4	6,650
HLRS 2015-03-060				6				50	4	6,650
HLRS 2015-03-080				8				50	4	7,000
HLRS 2015-03-100				10				50	4	7,000
HLRS 2015-03-120				12				55	4	7,000
HLRS 2015-03-160				16				55	4	7,000
HLRS 2015-03-200				20				60	4	7,000
HLRS 2015-05-040			R0.5	4				50	4	6,650
HLRS 2015-05-060				6				50	4	6,650
HLRS 2015-05-080				8				50	4	7,000
HLRS 2015-05-100				10				50	4	7,000
HLRS 2015-05-120				12				55	4	7,000
HLRS 2015-05-160				16				55	4	7,000
HLRS 2015-05-200				20				60	4	7,000
HLRS 2020-005-040		2	R0.05	4	2	1.92	16°	50	4	6,650
HLRS 2020-005-060				6				50	4	6,650
HLRS 2020-005-080				8				50	4	7,000
HLRS 2020-005-100				10				50	4	7,000
HLRS 2020-01-040			R0.1	4				50	4	6,650
HLRS 2020-01-040E	○			4				50	4	7,320
HLRS 2020-01-060				6				50	4	6,650
HLRS 2020-01-060E	○			6				50	4	7,320
HLRS 2020-01-080				8				50	4	7,000
HLRS 2020-01-080E	○			8				50	4	7,700
HLRS 2020-01-100				10				50	4	7,000
HLRS 2020-01-100E	○			10				50	4	7,700
HLRS 2020-01-120				12				55	4	7,000
HLRS 2020-01-120E	○			12				55	4	7,700
HLRS 2020-01-160				16				60	4	7,000
HLRS 2020-01-200				20				60	4	7,000
HLRS 2020-01-260				26				70	4	7,000
HLRS 2020-01-300				30				70	4	7,000
HLRS 2020-02-040			R0.2	4				50	4	6,650
HLRS 2020-02-040E	○			4				50	4	7,320
HLRS 2020-02-060				6				50	4	6,650
HLRS 2020-02-060E	○			6				50	4	7,320
HLRS 2020-02-080				8				50	4	7,000
HLRS 2020-02-080E	○			8				50	4	7,700
HLRS 2020-02-100				10				50	4	7,000
HLRS 2020-02-100E	○			10				50	4	7,700

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

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Effective Length by Inclined Angles				
					30′	1°	1°30′	2°	3°
HLRS 2015-02-040		1.5	R0.2	4	4.12	4.25	4.39	4.54	4.88
HLRS 2015-02-060				6	6.18	6.38	6.59	6.82	7.33
HLRS 2015-02-080				8	8.24	8.51	8.79	9.10	9.77
HLRS 2015-02-100				10	10.31	10.64	10.99	11.37	12.22
HLRS 2015-02-120				12	12.37	12.77	13.19	13.65	14.67
HLRS 2015-02-160				16	16.49	17.03	17.60	18.21	19.56
HLRS 2015-02-200				20	20.62	21.29	22.00	22.76	No Interference
HLRS 2015-03-040			R0.3	4	4.12	4.25	4.39	4.54	4.87
HLRS 2015-03-060				6	6.18	6.38	6.59	6.81	7.31
HLRS 2015-03-080				8	8.24	8.51	8.79	9.09	9.76
HLRS 2015-03-100				10	10.30	10.64	10.99	11.37	12.21
HLRS 2015-03-120				12	12.37	12.77	13.19	13.64	14.66
HLRS 2015-03-160				16	16.49	17.02	17.59	18.20	19.55
HLRS 2015-03-200				20	20.62	21.28	21.99	22.75	No Interference
HLRS 2015-05-040			R0.5	4	4.11	4.24	4.38	4.52	4.85
HLRS 2015-05-060				6	6.18	6.37	6.58	6.80	7.29
HLRS 2015-05-080				8	8.24	8.50	8.78	9.08	9.74
HLRS 2015-05-100				10	10.30	10.63	10.98	11.35	12.19
HLRS 2015-05-120				12	12.36	12.76	13.18	13.63	14.64
HLRS 2015-05-160				16	16.49	17.02	17.58	18.19	19.53
HLRS 2015-05-200				20	20.62	21.28	21.98	22.74	24.42
HLRS 2020-005-040		2	R0.05	4	4.16	4.29	4.44	4.59	4.94
HLRS 2020-005-060				6	6.22	6.42	6.64	6.87	7.38
HLRS 2020-005-080				8	8.28	8.55	8.84	9.15	9.83
HLRS 2020-005-100				10	10.35	10.68	11.04	11.42	12.28
HLRS 2020-01-040			R0.1	4	4.16	4.29	4.43	4.59	4.93
HLRS 2020-01-040E	○			4	4.16	4.29	4.43	4.59	4.93
HLRS 2020-01-060				6	6.22	6.42	6.64	6.87	7.38
HLRS 2020-01-060E	○			6	6.22	6.42	6.64	6.87	7.38
HLRS 2020-01-080				8	8.28	8.55	8.84	9.14	9.83
HLRS 2020-01-080E	○			8	8.28	8.55	8.84	9.14	9.83
HLRS 2020-01-100				10	10.34	10.68	11.04	11.42	12.27
HLRS 2020-01-100E	○			10	10.34	10.68	11.04	11.42	12.27
HLRS 2020-01-120				12	12.41	12.81	13.24	13.70	14.72
HLRS 2020-01-120E	○			12	12.41	12.81	13.24	13.70	14.72
HLRS 2020-01-160				16	16.53	17.07	17.64	18.25	No Interference
HLRS 2020-01-200				20	20.66	21.33	22.04	22.81	No Interference
HLRS 2020-01-260				26	26.85	27.72	28.65	No Interference	No Interference
HLRS 2020-01-300				30	30.97	31.98	33.05	No Interference	No Interference
HLRS 2020-02-040			R0.2	4	4.15	4.29	4.43	4.58	4.92
HLRS 2020-02-040E	○			4	4.15	4.29	4.43	4.58	4.92
HLRS 2020-02-060				6	6.22	6.42	6.63	6.86	7.37
HLRS 2020-02-060E	○			6	6.22	6.42	6.63	6.86	7.37
HLRS 2020-02-080				8	8.28	8.55	8.83	9.14	9.82
HLRS 2020-02-080E	○			8	8.28	8.55	8.83	9.14	9.82
HLRS 2020-02-100				10	10.34	10.68	11.03	11.41	12.26
HLRS 2020-02-100E	○			10	10.34	10.68	11.03	11.41	12.26

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Price (¥)
HLRS 2020-02-120		2	R0.2	12	2	1.92	16°	55	4	7,000
HLRS 2020-02-120E	○			12				55	4	7,700
HLRS 2020-02-160				16				60	4	7,000
HLRS 2020-02-200				20				60	4	7,000
HLRS 2020-02-260				26				70	4	7,000
HLRS 2020-02-300				30				70	4	7,000
HLRS 2020-03-040			R0.3	4				50	4	6,650
HLRS 2020-03-040E	○			4				50	4	7,320
HLRS 2020-03-060				6				50	4	6,650
HLRS 2020-03-060E	○			6				50	4	7,320
HLRS 2020-03-080				8				50	4	7,000
HLRS 2020-03-080E	○			8				50	4	7,700
HLRS 2020-03-100				10				50	4	7,000
HLRS 2020-03-100E	○			10				50	4	7,700
HLRS 2020-03-120				12				55	4	7,000
HLRS 2020-03-120E	○			12				55	4	7,700
HLRS 2020-03-160				16				60	4	7,000
HLRS 2020-03-200				20				60	4	7,000
HLRS 2020-03-260				26				70	4	7,000
HLRS 2020-03-300				30				70	4	7,000
HLRS 2020-05-040			R0.5	4				50	4	6,650
HLRS 2020-05-040E	○			4				50	4	7,320
HLRS 2020-05-060				6				50	4	6,650
HLRS 2020-05-060E	○			6				50	4	7,320
HLRS 2020-05-080				8				50	4	7,000
HLRS 2020-05-080E	○			8				50	4	7,700
HLRS 2020-05-100				10				50	4	7,000
HLRS 2020-05-100E	○			10				50	4	7,700
HLRS 2020-05-120				12				55	4	7,000
HLRS 2020-05-120E	○			12				55	4	7,700
HLRS 2020-05-160				16				60	4	7,000
HLRS 2020-05-200				20				60	4	7,000
HLRS 2020-05-260				26				70	4	7,000
HLRS 2020-05-300				30				70	4	7,000
HLRS 2025-01-100		2.5	R0.1	10	2.5	2.42	16°	50	4	7,340
HLRS 2025-01-200				20				60	4	7,570
HLRS 2025-01-300				30				70	4	7,800
HLRS 2025-02-100			R0.2	10				50	4	7,340
HLRS 2025-02-200				20				60	4	7,570
HLRS 2025-02-300				30				70	4	7,800
HLRS 2025-03-100			R0.3	10				50	4	7,340
HLRS 2025-03-200				20				60	4	7,570
HLRS 2025-03-300				30				70	4	7,800
HLRS 2025-05-100			R0.5	10				50	4	7,340
HLRS 2025-05-200				20				60	4	7,570
HLRS 2025-05-300				30				70	4	7,800

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Effective Length by Inclined Angles				
					30′	1°	1°30′	2°	3°
HLRS 2020-02-120		2	R0.2	12	12.40	12.81	13.23	13.69	14.71
HLRS 2020-02-120E	○			12	12.40	12.81	13.23	13.69	14.71
HLRS 2020-02-160				16	16.53	17.06	17.64	18.25	No Interference
HLRS 2020-02-200				20	20.66	21.32	22.04	22.80	No Interference
HLRS 2020-02-260				26	26.84	27.71	28.64	No Interference	No Interference
HLRS 2020-02-300				30	30.97	31.97	33.04	No Interference	No Interference
HLRS 2020-03-040			R0.3	4	4.15	4.28	4.42	4.57	4.91
HLRS 2020-03-040E	○			4	4.15	4.28	4.42	4.57	4.91
HLRS 2020-03-060				6	6.21	6.41	6.63	6.85	7.36
HLRS 2020-03-060E	○			6	6.21	6.41	6.63	6.85	7.36
HLRS 2020-03-080				8	8.28	8.54	8.83	9.13	9.80
HLRS 2020-03-080E	○			8	8.28	8.54	8.83	9.13	9.80
HLRS 2020-03-100				10	10.34	10.67	11.03	11.41	12.25
HLRS 2020-03-100E	○			10	10.34	10.67	11.03	11.41	12.25
HLRS 2020-03-120				12	12.40	12.80	13.23	13.68	14.70
HLRS 2020-03-120E	○			12	12.40	12.80	13.23	13.68	14.70
HLRS 2020-03-160				16	16.53	17.06	17.63	18.24	19.59
HLRS 2020-03-200				20	20.65	21.32	22.03	22.79	No Interference
HLRS 2020-03-260				26	26.84	27.71	28.64	No Interference	No Interference
HLRS 2020-03-300				30	30.97	31.97	33.04	No Interference	No Interference
HLRS 2020-05-040			R0.5	4	4.15	4.28	4.41	4.56	4.89
HLRS 2020-05-040E	○			4	4.15	4.28	4.41	4.56	4.89
HLRS 2020-05-060				6	6.21	6.41	6.62	6.84	7.34
HLRS 2020-05-060E	○			6	6.21	6.41	6.62	6.84	7.34
HLRS 2020-05-080				8	8.27	8.54	8.82	9.12	9.78
HLRS 2020-05-080E	○			8	8.27	8.54	8.82	9.12	9.78
HLRS 2020-05-100				10	10.34	10.67	11.02	11.39	12.23
HLRS 2020-05-100E	○			10	10.34	10.67	11.02	11.39	12.23
HLRS 2020-05-120				12	12.40	12.80	13.22	13.67	14.68
HLRS 2020-05-120E	○			12	12.40	12.80	13.22	13.67	14.68
HLRS 2020-05-160				16	16.53	17.06	17.62	18.23	19.57
HLRS 2020-05-200				20	20.65	21.31	22.02	22.78	No Interference
HLRS 2020-05-260				26	26.84	27.70	28.63	No Interference	No Interference
HLRS 2020-05-300				30	30.97	31.96	33.03	No Interference	No Interference
HLRS 2025-01-100		2.5	R0.1	10	10.34	10.68	11.04	11.42	12.27
HLRS 2025-01-200				20	20.66	21.33	22.04	No Interference	No Interference
HLRS 2025-01-300				30	30.97	31.98	No Interference	No Interference	No Interference
HLRS 2025-02-100			R0.2	10	10.34	10.68	11.03	11.41	12.26
HLRS 2025-02-200				20	20.66	21.32	22.04	No Interference	No Interference
HLRS 2025-02-300				30	30.97	31.97	No Interference	No Interference	No Interference
HLRS 2025-03-100			R0.3	10	10.34	10.67	11.03	11.41	12.25
HLRS 2025-03-200				20	20.65	21.32	22.03	No Interference	No Interference
HLRS 2025-03-300				30	30.97	31.97	No Interference	No Interference	No Interference
HLRS 2025-05-100			R0.5	10	10.34	10.67	11.02	11.39	12.23
HLRS 2025-05-200				20	20.65	21.31	22.02	No Interference	No Interference
HLRS 2025-05-300				30	30.97	31.96	No Interference	No Interference	No Interference

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Price (¥)
HLRS 2030-01-060		3	R0.1	6	3	2.92	16°	55	6	6,000
HLRS 2030-01-060E	○			6				55	6	6,600
HLRS 2030-01-120				12				55	6	7,800
HLRS 2030-01-160				16				60	6	9,100
HLRS 2030-01-160E	○			16				60	6	10,010
HLRS 2030-01-180				18				60	6	9,100
HLRS 2030-01-200				20				60	6	9,100
HLRS 2030-01-260				26				70	6	9,100
HLRS 2030-01-300				30				70	6	9,100
HLRS 2030-01-360				36				80	6	11,200
HLRS 2030-02-060			R0.2	6				55	6	6,000
HLRS 2030-02-060E	○			6				55	6	6,600
HLRS 2030-02-120				12				55	6	7,800
HLRS 2030-02-160				16				60	6	9,100
HLRS 2030-02-160E	○			16				60	6	10,010
HLRS 2030-02-180				18				60	6	9,100
HLRS 2030-02-200				20				60	6	9,100
HLRS 2030-02-260				26				70	6	9,100
HLRS 2030-02-300				30				70	6	9,100
HLRS 2030-02-360				36				80	6	11,200
HLRS 2030-03-060			R0.3	6				55	6	6,000
HLRS 2030-03-060E	○			6				55	6	6,600
HLRS 2030-03-120				12				55	6	7,800
HLRS 2030-03-160				16				60	6	9,100
HLRS 2030-03-160E	○			16				60	6	10,010
HLRS 2030-03-180				18				60	6	9,100
HLRS 2030-03-200				20				60	6	9,100
HLRS 2030-03-260				26				70	6	9,100
HLRS 2030-03-300				30				70	6	9,100
HLRS 2030-03-360				36				80	6	11,200
HLRS 2030-05-060			R0.5	6				55	6	6,000
HLRS 2030-05-060E	○			6				55	6	6,600
HLRS 2030-05-120				12				55	6	7,800
HLRS 2030-05-160				16				60	6	9,100
HLRS 2030-05-160E	○			16				60	6	10,010
HLRS 2030-05-180				18				60	6	9,100
HLRS 2030-05-200				20				60	6	9,100
HLRS 2030-05-260				26				70	6	9,100
HLRS 2030-05-300				30				70	6	9,100
HLRS 2030-05-360				36				80	6	11,200

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Effective Length by Inclined Angles				
					30′	1°	1°30′	2°	3°
HLRS 2030-01-060		3	R0.1	6	6.21	6.42	6.63	6.86	7.37
HLRS 2030-01-060E	○			6	6.21	6.42	6.63	6.86	7.37
HLRS 2030-01-120				12	12.40	12.81	13.23	13.69	14.72
HLRS 2030-01-160				16	16.53	17.06	17.64	18.25	19.61
HLRS 2030-01-160E	○			16	16.53	17.06	17.64	18.25	19.61
HLRS 2030-01-180				18	18.59	19.19	19.84	20.53	22.06
HLRS 2030-01-200				20	20.65	21.32	22.04	22.80	24.51
HLRS 2030-01-260				26	26.84	27.71	28.64	29.64	No Interference
HLRS 2030-01-300				30	30.97	31.97	33.04	34.19	No Interference
HLRS 2030-01-360				36	37.16	38.36	39.65	41.02	No Interference
HLRS 2030-02-060			R0.2	6	6.21	6.41	6.63	6.85	7.36
HLRS 2030-02-060E	○			6	6.21	6.41	6.63	6.85	7.36
HLRS 2030-02-120				12	12.40	12.80	13.23	13.69	14.71
HLRS 2030-02-160				16	16.53	17.06	17.63	18.24	19.60
HLRS 2030-02-160E	○			16	16.53	17.06	17.63	18.24	19.60
HLRS 2030-02-180				18	18.59	19.19	19.83	20.52	22.05
HLRS 2030-02-200				20	20.65	21.32	22.03	22.80	24.49
HLRS 2030-02-260				26	26.84	27.71	28.64	29.63	No Interference
HLRS 2030-02-300				30	30.97	31.97	33.04	34.18	No Interference
HLRS 2030-02-360				36	37.15	38.36	39.64	41.02	No Interference
HLRS 2030-03-060			R0.3	6	6.21	6.41	6.62	6.85	7.35
HLRS 2030-03-060E	○			6	6.21	6.41	6.62	6.85	7.35
HLRS 2030-03-120				12	12.40	12.80	13.22	13.68	14.70
HLRS 2030-03-160				16	16.53	17.06	17.63	18.23	19.59
HLRS 2030-03-160E	○			16	16.53	17.06	17.63	18.23	19.59
HLRS 2030-03-180				18	18.59	19.19	19.83	20.51	22.04
HLRS 2030-03-200				20	20.65	21.32	22.03	22.79	24.48
HLRS 2030-03-260				26	26.84	27.71	28.63	29.62	No Interference
HLRS 2030-03-300				30	30.96	31.97	33.03	34.18	No Interference
HLRS 2030-03-360				36	37.15	38.35	39.64	41.01	No Interference
HLRS 2030-05-060			R0.5	6	6.21	6.40	6.61	6.83	7.33
HLRS 2030-05-060E	○			6	6.21	6.40	6.61	6.83	7.33
HLRS 2030-05-120				12	12.40	12.79	13.21	13.67	14.67
HLRS 2030-05-160				16	16.52	17.05	17.62	18.22	19.57
HLRS 2030-05-160E	○			16	16.52	17.05	17.62	18.22	19.57
HLRS 2030-05-180				18	18.58	19.18	19.82	20.50	22.02
HLRS 2030-05-200				20	20.65	21.31	22.02	22.78	24.46
HLRS 2030-05-260				26	26.84	27.70	28.62	29.61	No Interference
HLRS 2030-05-300				30	30.96	31.96	33.02	34.16	No Interference
HLRS 2030-05-360				36	37.15	38.35	39.63	41.00	No Interference

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Price (¥)
HLRS 2030-10-060		3	R1	6	3	2.92	16°	55	6	6,000
HLRS 2030-10-060E	○			6				55	6	6,600
HLRS 2030-10-120				12				55	6	7,800
HLRS 2030-10-160				16				60	6	9,100
HLRS 2030-10-160E	○			16				60	6	10,010
HLRS 2030-10-180				18				60	6	9,100
HLRS 2030-10-200				20				60	6	9,100
HLRS 2030-10-260				26				70	6	9,100
HLRS 2030-10-300				30				70	6	9,100
HLRS 2030-10-360				36				80	6	11,200
HLRS 2040-01-080		4	R0.1	8	4	3.82	16°	65	6	7,800
HLRS 2040-01-080E	○			8				65	6	8,580
HLRS 2040-01-120				12				65	6	8,000
HLRS 2040-01-160				16				65	6	9,400
HLRS 2040-01-200				20				65	6	10,130
HLRS 2040-01-200E	○			20				65	6	11,140
HLRS 2040-01-240				24				70	6	10,130
HLRS 2040-01-320				32				80	6	10,130
HLRS 2040-01-480				48				100	6	16,200
HLRS 2040-02-080			R0.2	8				65	6	7,800
HLRS 2040-02-080E	○			8				65	6	8,580
HLRS 2040-02-120				12				65	6	8,000
HLRS 2040-02-160				16				65	6	9,400
HLRS 2040-02-200				20				65	6	10,130
HLRS 2040-02-200E	○			20				65	6	11,140
HLRS 2040-02-240				24				70	6	10,130
HLRS 2040-02-320				32				80	6	10,130
HLRS 2040-02-480				48				100	6	16,200
HLRS 2040-03-080			R0.3	8				65	6	7,800
HLRS 2040-03-080E	○			8				65	6	8,580
HLRS 2040-03-120				12				65	6	8,000
HLRS 2040-03-160				16				65	6	9,400
HLRS 2040-03-200				20				65	6	10,130
HLRS 2040-03-200E	○			20				65	6	11,140
HLRS 2040-03-240				24				70	6	10,130
HLRS 2040-03-320				32				80	6	10,130
HLRS 2040-03-480				48				100	6	16,200
HLRS 2040-05-080			R0.5	8				65	6	7,800
HLRS 2040-05-080E	○			8				65	6	8,580
HLRS 2040-05-120				12				65	6	8,000
HLRS 2040-05-160				16				65	6	9,400
HLRS 2040-05-200				20				65	6	10,130
HLRS 2040-05-200E	○			20				65	6	11,140
HLRS 2040-05-240				24				70	6	10,130
HLRS 2040-05-320				32				80	6	10,130
HLRS 2040-05-480				48				100	6	16,200

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Effective Length by Inclined Angles				
					30′	1°	1°30′	2°	3°
HLRS 2030-10-060		3	R1	6	6.20	6.39	6.59	6.80	7.28
HLRS 2030-10-060E	○			6	6.20	6.39	6.59	6.80	7.28
HLRS 2030-10-120				12	12.39	12.78	13.19	13.63	14.62
HLRS 2030-10-160				16	16.51	17.04	17.59	18.19	19.52
HLRS 2030-10-160E	○			16	16.51	17.04	17.59	18.19	19.52
HLRS 2030-10-180				18	18.58	19.17	19.79	20.47	21.96
HLRS 2030-10-200				20	20.64	21.29	21.99	22.74	24.41
HLRS 2030-10-260				26	26.83	27.68	28.60	29.57	No Interference
HLRS 2030-10-300				30	30.95	31.94	33.00	34.13	No Interference
HLRS 2030-10-360				36	37.14	38.33	39.60	40.96	No Interference
HLRS 2040-01-080		4	R0.1	8	8.45	8.73	9.02	9.33	10.03
HLRS 2040-01-080E	○			8	8.45	8.73	9.02	9.33	10.03
HLRS 2040-01-120				12	12.58	12.99	13.42	13.89	14.92
HLRS 2040-01-160				16	16.70	17.25	17.82	18.44	No Interference
HLRS 2040-01-200				20	20.83	21.50	22.23	23.00	No Interference
HLRS 2040-01-200E	○			20	20.83	21.50	22.23	23.00	No Interference
HLRS 2040-01-240				24	24.95	25.76	26.63	27.55	No Interference
HLRS 2040-01-320				32	33.21	34.28	35.43	No Interference	No Interference
HLRS 2040-01-480				48	49.71	51.32	No Interference	No Interference	No Interference
HLRS 2040-02-080			R0.2	8	8.45	8.72	9.01	9.33	10.02
HLRS 2040-02-080E	○			8	8.45	8.72	9.01	9.33	10.02
HLRS 2040-02-120				12	12.58	12.98	13.42	13.88	14.91
HLRS 2040-02-160				16	16.70	17.24	17.82	18.44	No Interference
HLRS 2040-02-200				20	20.83	21.50	22.22	22.99	No Interference
HLRS 2040-02-200E	○			20	20.83	21.50	22.22	22.99	No Interference
HLRS 2040-02-240				24	24.95	25.76	26.62	27.54	No Interference
HLRS 2040-02-320				32	33.20	34.28	35.43	No Interference	No Interference
HLRS 2040-02-480				48	49.71	51.32	No Interference	No Interference	No Interference
HLRS 2040-03-080			R0.3	8	8.45	8.72	9.01	9.32	10.01
HLRS 2040-03-080E	○			8	8.45	8.72	9.01	9.32	10.01
HLRS 2040-03-120				12	12.58	12.98	13.41	13.87	14.69
HLRS 2040-03-160				16	16.70	17.24	17.81	18.43	No Interference
HLRS 2040-03-200				20	20.83	21.50	22.22	22.98	No Interference
HLRS 2040-03-200E	○			20	20.83	21.50	22.22	22.98	No Interference
HLRS 2040-03-240				24	24.95	25.76	26.62	27.54	No Interference
HLRS 2040-03-320				32	33.20	34.28	35.42	No Interference	No Interference
HLRS 2040-03-480				48	49.71	51.31	No Interference	No Interference	No Interference
HLRS 2040-05-080			R0.5	8	8.45	8.71	9.00	9.31	9.99
HLRS 2040-05-080E	○			8	8.45	8.71	9.00	9.31	9.99
HLRS 2040-05-120				12	12.57	12.97	13.40	13.86	14.88
HLRS 2040-05-160				16	16.70	17.23	17.80	18.42	No Interference
HLRS 2040-05-200				20	20.82	21.49	22.21	22.97	No Interference
HLRS 2040-05-200E	○			20	20.82	21.49	22.21	22.97	No Interference
HLRS 2040-05-240				24	24.95	25.75	26.61	27.52	No Interference
HLRS 2040-05-320				32	33.20	34.27	35.41	No Interference	No Interference
HLRS 2040-05-480				48	49.70	51.31	No Interference	No Interference	No Interference

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Price (¥)
HLRS 2040-10-080		4	R1	8	4	3.82	16°	65	6	7,800
HLRS 2040-10-080E	○			8				65	6	8,580
HLRS 2040-10-120				12				65	6	8,000
HLRS 2040-10-160				16				65	6	9,400
HLRS 2040-10-200				20				65	6	10,130
HLRS 2040-10-200E	○			20				65	6	11,140
HLRS 2040-10-240				24				70	6	10,130
HLRS 2040-10-320				32				80	6	10,130
HLRS 2040-10-480				48				100	6	16,200
HLRS 2050-02-200		5	R0.2	20	5	4.82	16°	70	6	12,900
HLRS 2050-02-400				40				90	6	16,200
HLRS 2050-03-200			R0.3	20				70	6	12,900
HLRS 2050-03-400				40				90	6	16,200
HLRS 2050-05-200			R0.5	20				70	6	12,900
HLRS 2050-05-400				40				90	6	16,200
HLRS 2050-10-200			R1	20				70	6	12,900
HLRS 2050-10-400				40				90	6	16,200
HLRS 2060-01-120		6	R0.1	12	6	5.82	–	65	6	12,900
HLRS 2060-01-120E	○			12				65	6	14,190
HLRS 2060-01-200				20				70	6	12,900
HLRS 2060-01-300				30				100	6	16,700
HLRS 2060-01-300E	○			30				100	6	18,370
HLRS 2060-01-600				60				120	6	20,300
HLRS 2060-02-120			R0.2	12				65	6	12,900
HLRS 2060-02-120E	○			12				65	6	14,190
HLRS 2060-02-200				20				70	6	12,900
HLRS 2060-02-300				30				100	6	16,700
HLRS 2060-02-300E	○			30				100	6	18,370
HLRS 2060-02-600				60				120	6	20,300
HLRS 2060-03-120			R0.3	12				65	6	12,900
HLRS 2060-03-120E	○			12				65	6	14,190
HLRS 2060-03-200				20				70	6	12,900
HLRS 2060-03-300				30				100	6	16,700
HLRS 2060-03-300E	○			30				100	6	18,370
HLRS 2060-03-600				60				120	6	20,300
HLRS 2060-05-120			R0.5	12				65	6	12,900
HLRS 2060-05-120E	○			12				65	6	14,190
HLRS 2060-05-200				20				70	6	12,900
HLRS 2060-05-300				30				100	6	16,700
HLRS 2060-05-300E	○			30				100	6	18,370
HLRS 2060-05-600				60				120	6	20,300
HLRS 2060-10-120			R1	12				65	6	12,900
HLRS 2060-10-120E	○			12				65	6	14,190
HLRS 2060-10-200				20				70	6	12,900
HLRS 2060-10-300				30				100	6	16,700
HLRS 2060-10-300E	○			30				100	6	18,370
HLRS 2060-10-600				60				120	6	20,300

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Unit (mm)

Model Number	Excellent	Outside Diameter φD	Corner Radius CR	Effective Length ℓ1	Effective Length by Inclined Angles				
					30′	1°	1°30′	2°	3°
HLRS 2040-10-080		4	R1	8	8.44	8.70	8.98	9.27	9.93
HLRS 2040-10-080E	○			8	8.44	8.70	8.98	9.27	9.93
HLRS 2040-10-120				12	12.56	12.96	13.38	13.83	14.83
HLRS 2040-10-160				16	16.69	17.22	17.78	18.38	19.72
HLRS 2040-10-200				20	20.82	21.48	22.18	22.94	No Interference
HLRS 2040-10-200E	○			20	20.82	21.48	22.18	22.94	No Interference
HLRS 2040-10-240				24	24.94	25.74	26.58	27.49	No Interference
HLRS 2040-10-320				32	33.19	34.25	35.39	No Interference	No Interference
HLRS 2040-10-480				48	49.69	51.29	No Interference	No Interference	No Interference
HLRS 2050-02-200		5	R0.2	20	20.83	21.50	No Interference	No Interference	No Interference
HLRS 2050-02-400				40	41.46	No Interference	No Interference	No Interference	No Interference
HLRS 2050-03-200			R0.3	20	20.83	21.50	No Interference	No Interference	No Interference
HLRS 2050-03-400				40	41.45	No Interference	No Interference	No Interference	No Interference
HLRS 2050-05-200			R0.5	20	20.82	21.49	No Interference	No Interference	No Interference
HLRS 2050-05-400				40	41.45	No Interference	No Interference	No Interference	No Interference
HLRS 2050-10-200			R1	20	20.82	21.48	No Interference	No Interference	No Interference
HLRS 2050-10-400				40	41.44	No Interference	No Interference	No Interference	No Interference
HLRS 2060-01-120		6	R0.1	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-01-120E	○			12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-01-200				20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-01-300				30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-01-300E	○			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-01-600				60	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-02-120			R0.2	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-02-120E	○			12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-02-200				20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-02-300				30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-02-300E	○			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-02-600				60	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-03-120			R0.3	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-03-120E	○			12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-03-200				20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-03-300				30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-03-300E	○			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-03-600				60	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-05-120			R0.5	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-05-120E	○			12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-05-200				20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-05-300				30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-05-300E	○			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-05-600				60	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-10-120			R1	12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-10-120E	○			12	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-10-200				20	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-10-300				30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-10-300E	○			30	No Interference	No Interference	No Interference	No Interference	No Interference
HLRS 2060-10-600				60	No Interference	No Interference	No Interference	No Interference	No Interference

Milling Conditions for HLRS（2 Flutes）

WORK MATERIAL				Copper OFC/TPC				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^{-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)
2002	0.2	0.5	2.5	55,000	230	0.027	0.020	55,000	230	0.006	0.020	44,800	236	0.005	0.020	19,000	30	0.002	0.015
		1	5	55,000	200	0.027	0.020	55,000	200	0.006	0.020	35,000	150	0.004	0.020	15,000	25	0.0015	0.015
		1.5	7.5	55,000	180	0.017	0.010	55,000	180	0.005	0.010	27,000	100	0.003	0.010	12,000	20	0.001	0.007
		2	10	55,000	170	0.007	0.005	55,000	170	0.003	0.005	20,000	60	0.002	0.005	10,500	15	0.001	0.003
2003	0.3	1	3.3	60,000	500	0.030	0.020	60,000	500	0.007	0.020	35,000	350	0.005	0.020	22,000	35	0.004	0.015
		1.5	5	60,000	470	0.030	0.020	60,000	470	0.007	0.020	35,000	310	0.005	0.018	22,000	33	0.004	0.015
		2	6.7	60,000	400	0.030	0.020	60,000	400	0.007	0.020	33,200	250	0.005	0.015	20,000	32	0.004	0.015
		2.5	8.3	57,000	330	0.030	0.017	57,000	330	0.007	0.017	30,000	180	0.003	0.012	18,000	30	0.002	0.012
		3	10	52,000	220	0.030	0.015	52,000	220	0.006	0.015	25,000	80	0.003	0.010	15,000	20	0.002	0.010
2004	0.4	1	2.5	50,900	610	0.048	0.063	50,900	510	0.013	0.072	40,700	370	0.011	0.072	24,200	40	0.004	0.072
		1.5	3.75	45,200	580	0.045	0.063	45,200	480	0.012	0.054	36,200	360	0.010	0.054	21,500	38	0.004	0.054
		2	5	40,400	540	0.042	0.054	40,400	450	0.011	0.045	32,300	330	0.009	0.045	19,200	35	0.004	0.045
		3	7.5	33,900	460	0.027	0.054	33,900	390	0.008	0.027	27,100	280	0.007	0.027	16,100	30	0.003	0.027
		4	10	30,000	220	0.010	0.045	30,000	340	0.006	0.014	24,000	250	0.005	0.014	14,300	27	0.002	0.014
2005	0.5	1	2	49,200	1,370	0.081	0.117	49,200	1,140	0.034	0.122	40,000	860	0.030	0.122	24,800	94	0.013	0.122
		2	4	39,900	1,000	0.075	0.108	39,900	830	0.029	0.117	32,500	630	0.026	0.117	20,100	68	0.011	0.117
		3	6	31,900	770	0.057	0.090	31,900	640	0.023	0.113	26,000	480	0.020	0.113	16,100	52	0.008	0.113
		4	8	29,100	660	0.039	0.072	29,100	550	0.016	0.108	23,700	410	0.014	0.108	14,600	45	0.006	0.108
		5	10	26,400	570	0.027	0.045	26,400	470	0.011	0.099	21,500	360	0.010	0.099	13,300	39	0.004	0.099
		6	12	24,200	480	0.021	0.018	24,200	400	0.007	0.090	19,700	300	0.006	0.090	12,200	33	0.003	0.090
2006	0.6	2	3.3	28,600	610	0.114	0.162	28,600	510	0.010	0.219	23,700	390	0.010	0.219	15,200	43	0.004	0.219
		3	5	23,800	480	0.090	0.135	23,800	400	0.008	0.108	19,700	300	0.007	0.108	12,600	33	0.003	0.108
		4	6.7	20,400	400	0.063	0.108	20,400	330	0.005	0.104	16,800	250	0.005	0.104	10,800	28	0.002	0.1035
		6	10	16,800	300	0.036	0.045	16,800	250	0.003	0.099	13,900	190	0.003	0.099	8,900	21	0.001	0.099
		8	13.3	14,600	240	0.021	0.027	14,600	200	0.002	0.072	12,100	150	0.002	0.072	7,700	16	0.001	0.072
2007	0.7	4	5.7	18,400	480	0.087	0.162	18,400	400	0.008	0.117	15,500	310	0.008	0.117	10,200	35	0.004	0.117
		6	8.6	15,400	360	0.051	0.108	15,400	300	0.005	0.108	13,000	230	0.005	0.108	8,600	26	0.002	0.108
2008	0.8	4	5	17,500	540	0.132	0.198	17,500	450	0.014	0.117	15,000	360	0.015	0.117	10,200	41	0.007	0.117
		6	7.5	14,600	410	0.075	0.144	14,600	340	0.008	0.108	12,500	270	0.008	0.108	8,500	30	0.004	0.108
		8	10	12,800	310	0.030	0.100	12,800	270	0.005	0.090	11,000	185	0.004	0.090	7,600	20	0.002	0.090
2010	1	2	2	17,600	1,100	0.210	0.450	17,600	920	0.035	0.270	15,300	750	0.040	0.270	10,900	89	0.020	0.270
		3	3	15,500	1,050	0.205	0.425	15,500	870	0.031	0.270	13,200	720	0.037	0.270	9,400	86	0.018	0.270
		4	4	13,800	980	0.201	0.405	13,800	820	0.030	0.270	12,000	670	0.035	0.270	8,500	80	0.017	0.270
		5	5	12,500	900	0.160	0.400	12,500	720	0.025	0.240	11,000	600	0.030	0.240	7,800	72	0.015	0.240
		6	6	11,300	790	0.117	0.387	11,300	650	0.021	0.216	9,800	540	0.024	0.216	7,000	64	0.012	0.216
		8	8	9,800	590	0.072	0.360	9,800	490	0.016	0.189	8,500	400	0.018	0.189	6,100	48	0.009	0.189
		10	10	8,800	390	0.048	0.315	8,800	320	0.011	0.126	7,600	270	0.013	0.126	5,400	32	0.006	0.126
		12	12	8,100	260	0.033	0.270	8,100	210	0.008	0.072	7,000	180	0.009	0.072	5,000	21	0.004	0.072
		16	16	7,000	230	0.018	0.225	7,000	190	0.004	0.027	6,100	160	0.005	0.027	4,300	19	0.002	0.027
		20	20	6,300	160	0.015	0.180	6,300	130	0.003	0.018	5,500	110	0.003	0.018	3,900	13	0.001	0.018

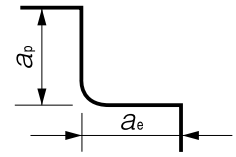
Milling Conditions for HLRS（2 Flutes）

WORK MATERIAL				Copper OFC/TPC				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^{-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)
2012	1.2	6	5	9,400	700	0.186	0.468	9,400	580	0.018	0.090	8,400	490	0.022	0.090	6,200	60	0.011	0.090
		12	10	6,800	440	0.054	0.405	6,800	370	0.007	0.072	6,100	310	0.008	0.072	4,500	38	0.004	0.072
		20	16.7	5,400	250	0.021	0.240	5,400	210	0.003	0.018	4,800	180	0.003	0.018	3,500	22	0.002	0.018
2015	1.5	4	2.7	13,200	1,310	0.300	0.675	13,200	1,090	0.045	0.450	12,000	950	0.060	0.450	9,200	124	0.033	0.450
		6	4	10,600	1,240	0.282	0.630	10,600	1,030	0.041	0.405	9,700	900	0.055	0.405	7,400	117	0.030	0.405
		8	5.3	9,300	1,050	0.204	0.612	9,300	870	0.034	0.315	8,500	760	0.045	0.315	6,500	99	0.025	0.315
		10	6.7	8,500	900	0.150	0.567	8,500	750	0.032	0.288	7,800	650	0.042	0.288	6,000	85	0.023	0.288
		12	8	7,800	800	0.114	0.540	7,800	670	0.029	0.270	7,100	580	0.038	0.270	5,400	76	0.021	0.270
		16	10.7	6,800	620	0.066	0.450	6,800	510	0.015	0.180	6,200	450	0.020	0.180	4,700	58	0.011	0.180
		20	13.3	6,000	490	0.042	0.360	6,000	410	0.005	0.108	5,500	360	0.006	0.108	4,200	46	0.003	0.108
2020	2	4	2	15,300	1,500	0.330	0.900	15,300	1,250	0.046	0.900	14,300	1,130	0.065	0.900	11,500	162	0.039	0.900
		6	3	12,800	1,220	0.321	0.855	12,800	1,020	0.043	0.810	12,000	930	0.060	0.810	9,700	133	0.036	0.810
		8	4	11,200	1,120	0.267	0.810	11,200	930	0.039	0.720	10,400	850	0.055	0.720	8,400	121	0.033	0.720
		10	5	10,000	1,050	0.225	0.765	10,000	870	0.033	0.585	9,300	790	0.047	0.585	7,600	113	0.028	0.585
		12	6	9,100	980	0.186	0.720	9,100	820	0.031	0.450	8,500	740	0.044	0.450	6,900	107	0.026	0.450
		16	8	7,800	830	0.132	0.702	7,800	690	0.028	0.315	7,300	630	0.039	0.315	5,900	90	0.023	0.315
		20	10	7,000	770	0.093	0.666	7,000	640	0.017	0.198	6,600	580	0.024	0.198	5,300	84	0.014	0.198
		26	13	6,200	700	0.060	0.540	6,200	580	0.006	0.144	5,800	530	0.008	0.144	4,600	75	0.005	0.144
		30	15	6,000	670	0.050	0.450	6,000	550	0.005	0.135	5,500	500	0.005	0.135	4,400	70	0.002	0.135
2025	2.5	10	4	10,500	1,220	0.339	0.855	10,500	1,020	0.052	0.540	10,000	960	0.075	0.540	8,400	154	0.048	0.540
		20	8	7,800	720	0.165	0.756	7,800	600	0.024	0.225	7,500	560	0.035	0.225	6,300	91	0.022	0.225
		30	12	6,300	540	0.069	0.630	6,300	450	0.011	0.180	6,000	420	0.016	0.180	5,000	67	0.010	0.180
2030	3	6	2	14,000	2,700	0.500	0.900	14,000	1,510	0.150	0.720	13,300	1,140	0.150	0.720	12,000	270	0.100	0.720
		12	4	10,500	1,600	0.390	0.850	10,500	1,150	0.105	0.670	10,000	890	0.105	0.670	9,000	200	0.075	0.670
		16	5.3	9,200	1,160	0.321	0.810	9,200	960	0.081	0.630	8,800	730	0.081	0.630	7,900	173	0.054	0.630
		18	6	8,800	1,100	0.290	0.790	8,800	900	0.078	0.600	8,300	700	0.078	0.600	7,500	160	0.048	0.600
		20	6.7	8,400	1,050	0.260	0.780	8,400	880	0.073	0.580	7,900	680	0.073	0.580	7,100	150	0.044	0.580
		26	8.7	7,500	980	0.180	0.720	7,500	820	0.065	0.495	7,100	620	0.065	0.495	6,400	146	0.043	0.495
		30	10	7,000	870	0.140	0.690	7,000	720	0.050	0.380	6,500	560	0.050	0.380	6,000	118	0.029	0.360
		36	12	6,400	710	0.090	0.630	6,400	590	0.022	0.180	6,100	440	0.022	0.180	5,500	105	0.014	0.180
2040	4	8	2	10,200	1,340	0.420	1.620	10,200	1,110	0.095	1.350	8,500	970	0.140	1.350	7,300	223	0.101	1.350
		12	3	8,900	1,300	0.410	1.560	8,900	1,080	0.083	1.150	7,600	950	0.120	1.150	6,400	215	0.085	1.150
		16	4	7,900	1,250	0.400	1.500	7,900	1,030	0.065	1.000	6,600	910	0.100	1.000	5,600	205	0.065	1.000
		20	5	6,900	1,190	0.384	1.440	6,900	990	0.054	0.900	5,800	860	0.080	0.900	4,900	198	0.058	0.900
		24	6	6,200	1,100	0.310	1.380	6,200	900	0.043	0.800	5,200	770	0.065	0.800	4,500	175	0.043	0.800
		32	8	5,500	860	0.189	1.260	5,500	720	0.027	0.648	4,600	630	0.040	0.648	3,900	144	0.029	0.648
		48	12	4,600	430	0.093	1.080	4,600	360	0.007	0.315	3,900	310	0.010	0.315	3,300	72	0.007	0.315

Milling Conditions for HLRS（2 Flutes）

WORK MATERIAL				Copper OFC / TPC				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^{-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)
2050	5	20	4	6,700	1,780	0.606	1,980	6,700	1,480	0.092	1.170	4,800	990	0.130	1.170	4,000	297	0.096	1.170
		40	8	4,600	850	0.297	1,530	4,600	710	0.046	0.900	3,300	470	0.065	0.900	2,800	143	0.048	0.900
2060	6	12	2	8,000	1,800	0.600	2,250	8,000	1,620	0.500	1.350	4,700	1,360	0.200	1.350	4,000	540	0.150	1.350
		20	3.3	5,800	1,350	0.580	2,120	5,800	1,180	0.460	1.310	3,500	1,000	0.180	1.310	3,000	380	0.140	1.310
		30	5	4,500	1,060	0.546	1,980	4,500	880	0.396	1.260	2,600	740	0.158	1.260	2,200	294	0.119	1.260
		60	10	2,800	530	0.156	1,620	2,800	440	0.113	0.990	1,600	370	0.045	0.990	1,400	147	0.034	0.990

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 Steels.
・Recommend wet coolant for Copper.