CBN-LRF4000

Additional 9 models

CBN-LRF4000 Introduction

4 Flute Long Neck Radius End Mills

Ø0.1～Ø3

CBN | 0° | R | R ±0.002 | Shank Dia 0/-0.004 | Back Taper Geometry

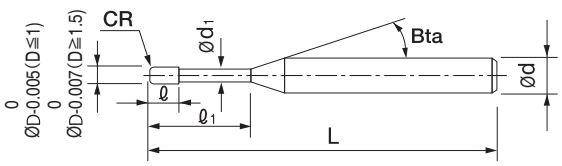
Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

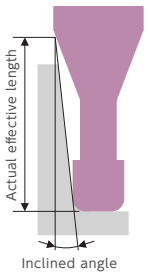
Work Material																
CARBON STEELS S45C S55C	ALLOY STEELS SK / SCM SUS	PREHARDENED STEELS NAK HPM	HARDENED STEELS ～50 HRC	HARDENED STEELS ～55 HRC	HARDENED STEELS ～60 HRC	HARDENED STEELS ～65 HRC	HARDENED STEELS ～70 HRC	CAST IRON	ALUMINUM ALLOYS	GRAPHITE	COPPER	PLASTICS	GLASS FILLED PLASTICS	TITANIUM ALLOYS	HEAT RESISTANT ALLOYS	CEMENTED CARBIDE	HARD BRITTLE (NON-METALLIC) MATERIALS
		○	●	●	●	●	●										

Label Sample

#001 ØD1.999 R+0.001/0.000

Diameter and Corner R accuracy measurements are printed on the label to support High Precision milling.





Total 71 models

Shank taper angle Bta is only for reference.

Unit (mm)

Model Number	Outside Diameter ØD	Corner Radius CR	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter Ød1	Shank Taper Angle Bta	Overall Length L	Shank Diameter Ød	Effective Length by Inclined Angles 30′	1°	1°30′	2°	3°
CBN-LRF 4001-002002	0.1	R0.02	0.2	0.04	0.09	15°	50	4	0.22	0.23	0.25	0.26	0.28
CBN-LRF 4001-002003			0.3				50	4	0.33	0.34	0.36	0.37	0.40
CBN-LRF 4001-002005			0.5				50	4	0.54	0.56	0.58	0.60	0.65
CBN-LRF 40015-002X2	0.15	R0.02	0.2	0.06	0.14	15°	50	4	0.22	0.23	0.25	0.26	0.28
CBN-LRF 40015-002X3			0.3				50	4	0.33	0.34	0.36	0.37	0.40
CBN-LRF 40015-002X5			0.5				50	4	0.54	0.56	0.58	0.60	0.65
CBN-LRF 4002-002005	0.2	R0.02	0.5	0.08	0.19	15°	50	4	0.54	0.56	0.58	0.60	0.65
CBN-LRF 4002-002X75			0.75				50	4	0.80	0.82	0.86	0.89	0.96
CBN-LRF 4002-002010			1				50	4	1.05	1.09	1.13	1.18	1.27
CBN-LRF 4002-005005		R0.05	0.5				50	4	0.53	0.55	0.57	0.60	0.65
CBN-LRF 4002-005X75			0.75				50	4	0.79	0.82	0.85	0.88	0.96
CBN-LRF 4002-005010			1				50	4	1.05	1.09	1.13	1.17	1.27
CBN-LRF 4003-002X75	0.3	R0.02	0.75	0.13	0.28	15°	50	4	0.83	0.86	0.89	0.92	1.00
CBN-LRF 4003-002010			1				50	4	1.08	1.12	1.17	1.21	1.31
CBN-LRF 4003-005005		R0.05	0.5				50	4	0.57	0.59	0.61	0.63	0.68
CBN-LRF 4004-002015	0.4	R0.02	1.5	0.24	0.38	15°	50	4	1.54	1.59	1.65	1.71	1.86
CBN-LRF 4004-003005		R0.03	0.5				50	4	0.51	0.53	0.55	0.57	0.62
CBN-LRF 4004-005005		R0.05	0.5				50	4	0.51	0.53	0.55	0.57	0.62
CBN-LRF 4004-005015			1.5				50	4	1.54	1.59	1.65	1.71	1.85
CBN-LRF 4004-010005		R0.1	0.5				50	4	0.51	0.53	0.54	0.56	0.61
CBN-LRF 4004-010010			1				50	4	1.03	1.06	1.10	1.14	1.23

4 Flute High-grade Long Neck Radius End Mills

	Model Number	Outside Diameter ØD	Corner Radius CR	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter Ød1	Shank Taper Angle Bta	Overall Length L	Shank Diameter Ød		Effective Length by Inclined Angles 30′	1°	1°30′	2°	3°
	CBN-LRF 4005-002010	0.5	R0.02	1	0.3	0.48	15°	50	4		1.03	1.07	1.11	1.15	1.25
	CBN-LRF 4005-005005		R0.05	0.5				50	4		0.51	0.53	0.55	0.57	0.62
	CBN-LRF 4005-005010			1				50	4		1.03	1.07	1.10	1.15	1.24
	CBN-LRF 4005-005015			1.5				50	4		1.54	1.59	1.65	1.71	1.85
	CBN-LRF 4005-010005		R0.1	0.5				50	4		0.51	0.53	0.54	0.56	0.61
	CBN-LRF 4005-010015			1.5				50	4		1.53	1.59	1.64	1.70	1.84
	CBN-LRF 4005-015005		R0.15	0.5				50	4		0.51	0.52	0.54	0.56	0.59
	CBN-LRF 4005-015015			1.5				50	4		1.53	1.58	1.64	1.69	1.83
	CBN-LRF 4006-005005	0.6	R0.05	0.5	0.3	0.58	15°	50	4		0.51	0.53	0.55	0.57	0.62
	CBN-LRF 4006-010005		R0.1	0.5				50	4		0.51	0.53	0.54	0.56	0.61
	CBN-LRF 4006-010010			1				50	4		1.03	1.06	1.10	1.14	1.23
	CBN-LRF 4008-005010	0.8	R0.05	1	0.56	0.78	15°	50	4		1.03	1.07	1.10	1.15	1.24
	CBN-LRF 4008-010010		R0.1	1				50	4		1.03	1.06	1.10	1.14	1.23
	CBN-LRF 4008-010020			2				50	4		2.05	2.12	2.20	2.28	2.46
	CBN-LRF 4008-010050			5				50	4		5.15	5.33	5.52	5.73	6.19
	CBN-LRF 4008-020010		R0.2	1				50	4		1.02	1.05	1.09	1.12	1.20
	CBN-LRF 4010-002010	1	R0.02	1	0.7	0.98	15°	50	4		1.03	1.07	1.11	1.15	1.25
	CBN-LRF 4010-002030			3				50	4		3.10	3.21	3.33	3.45	3.73
	CBN-LRF 4010-005010		R0.05	1				50	4		1.03	1.07	1.11	1.15	1.24
	CBN-LRF 4010-005020			2				50	4		2.06	2.14	2.21	2.30	2.48
	CBN-LRF 4010-010010		R0.1	1				50	4		1.03	1.06	1.10	1.14	1.23
	CBN-LRF 4010-010020			2				50	4		2.06	2.13	2.21	2.29	2.47
	CBN-LRF 4010-010030			3				50	4		3.10	3.20	3.32	3.44	3.72
	CBN-LRF 4010-020020		R0.2	2				50	4		2.06	2.13	2.20	2.28	2.45
	CBN-LRF 4015-002030	1.5	R0.02	3	1	1.46	15°	50	4		3.13	3.24	3.36	3.49	3.78
	CBN-LRF 4015-010030		R0.1	3				50	4		3.13	3.24	3.35	3.48	3.76
	CBN-LRF 4015-030030		R0.3	3				50	4		3.12	3.23	3.33	3.45	3.71
	CBN-LRF 4015-050030		R0.5	3				50	4		3.12	3.21	3.31	3.42	3.66
	CBN-LRF 4020-002040	2	R0.02	4	1.2	1.97	15°	50	4		4.15	4.29	4.45	4.62	5.00
	CBN-LRF 4020-002060			6				50	4		6.22	6.43	6.67	6.92	7.48
	CBN-LRF 4020-002100			10				50	4		10.35	10.71	11.10	11.52	12.46
	CBN-LRF 4020-005060		R0.05	6				50	4		6.21	6.43	6.66	6.91	7.48
	CBN-LRF 4020-005100			10				50	4		10.35	10.71	11.10	11.51	12.45
	CBN-LRF 4020-010040		R0.1	4				50	4		4.15	4.29	4.44	4.61	4.98
	CBN-LRF 4020-010060			6				50	4		6.21	6.43	6.66	6.91	7.46
	CBN-LRF 4020-010100			10				50	4		10.35	10.71	11.09	11.51	12.44
	CBN-LRF 4020-020040		R0.2	4				50	4		4.14	4.28	4.43	4.59	4.95
	CBN-LRF 4020-020060			6				50	4		6.21	6.42	6.65	6.89	7.44
	CBN-LRF 4020-020100			10				50	4		10.34	10.70	11.08	11.49	12.41
	CBN-LRF 4020-050060		R0.5	6				50	4		6.20	6.40	6.62	6.85	7.37
	CBN-LRF 4020-050100			10				50	4		10.33	10.68	11.05	11.45	12.34
※	CBN-LRF 4030-005060	3	R0.05	6	0.7	2.94	15°	50	6		6.27	6.49	6.73	6.98	7.55
※	CBN-LRF 4030-005100			10				50	6		10.41	10.77	11.16	11.58	12.52
※	CBN-LRF 4030-005150			15				50	6		15.58	16.12	16.70	17.33	18.73
※	CBN-LRF 4030-010060		R0.1	6				50	6		6.27	6.49	6.72	6.97	7.53
※	CBN-LRF 4030-010100			10				50	6		10.41	10.77	11.15	11.57	12.51
※	CBN-LRF 4030-010150			15				50	6		15.57	16.12	16.70	17.32	18.72
※	CBN-LRF 4030-020060		R0.2	6				50	6		6.27	6.48	6.71	6.96	7.51
※	CBN-LRF 4030-020100			10				50	6		10.40	10.76	11.14	11.56	12.48
※	CBN-LRF 4030-020150			15				50	6		15.57	16.11	16.68	17.31	18.70

※ Additional model

※ For Ø3mm, 0.7 mm of the tool tip is made of CBN material.

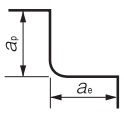
Milling Conditions for CBN-LRF (4 Flutes)

WORK MATERIAL				HEAT-TREATED STEELS / HARDENED STEELS STAVAX (~52HRC)				HARDENED STEELS SKD11 (~62HRC)				HARDENED STEELS HAP10 / HAP72 (~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)
4001-002002	0.1	R0.02	0.2	60,000	360	0.002	0.02	55,000	280	0.002	0.015	50,000	200	0.002	0.01
4001-002003			0.3	60,000	360	0.002	0.02	55,000	280	0.002	0.015	50,000	200	0.002	0.01
4001-002005			0.5	60,000	360	0.002	0.02	55,000	280	0.002	0.015	50,000	200	0.002	0.01
40015-002X2	0.15	R0.02	0.2	60,000	480	0.003	0.03	55,000	340	0.003	0.025	50,000	250	0.002	0.015
40015-002X3			0.3	60,000	480	0.003	0.03	55,000	340	0.003	0.025	50,000	250	0.002	0.015
40015-002X5			0.5	60,000	480	0.003	0.03	55,000	340	0.003	0.025	50,000	250	0.002	0.015
4002-002005	0.2	R0.02	0.5	60,000	560	0.003	0.04	55,000	430	0.003	0.03	50,000	300	0.003	0.02
4002-002X75			0.75	60,000	560	0.003	0.04	55,000	430	0.003	0.03	50,000	300	0.003	0.02
4002-002010			1	60,000	560	0.003	0.04	55,000	430	0.003	0.03	50,000	300	0.003	0.02
4002-005005		R0.05	0.5	60,000	700	0.003	0.04	55,000	550	0.003	0.03	50,000	410	0.003	0.02
4002-005X75			0.75	60,000	700	0.003	0.04	55,000	550	0.003	0.03	50,000	410	0.003	0.02
4002-005010			1	60,000	700	0.003	0.04	55,000	550	0.003	0.03	50,000	410	0.003	0.02
4003-002X75	0.3	R0.02	0.75	60,000	750	0.003	0.08	55,000	580	0.003	0.06	50,000	400	0.003	0.03
4003-002010			1	60,000	750	0.003	0.08	55,000	580	0.003	0.06	50,000	400	0.003	0.03
4003-005005		R0.05	0.5	60,000	950	0.005	0.08	55,000	750	0.005	0.06	50,000	550	0.004	0.03
4004-002015	0.4	R0.02	1.5	55,000	850	0.005	0.1	53,000	700	0.005	0.08	50,000	550	0.004	0.05
4004-003005		R0.03	0.5	55,000	1,000	0.006	0.1	53,000	800	0.006	0.08	50,000	600	0.004	0.05
4004-005005		R0.05	0.5	55,000	1,200	0.01	0.1	53,000	1,000	0.01	0.08	50,000	730	0.007	0.05
4004-005015			1.5	55,000	1,200	0.01	0.1	53,000	1,000	0.01	0.08	50,000	730	0.007	0.05
4004-010005		R0.1	0.5	55,000	1,500	0.01	0.1	53,000	1,300	0.01	0.08	50,000	1,000	0.008	0.05
4004-010010			1	55,000	1,500	0.01	0.1	53,000	1,300	0.01	0.08	50,000	1,000	0.008	0.05
4005-002010	0.5	R0.02	1	50,000	950	0.005	0.15	50,000	900	0.005	0.12	50,000	700	0.005	0.08
4005-005005		R0.05	0.5	50,000	1,500	0.01	0.15	50,000	1,300	0.01	0.12	50,000	1,000	0.01	0.08
4005-005010			1	50,000	1,500	0.01	0.15	50,000	1,300	0.01	0.12	50,000	1,000	0.01	0.08
4005-005015			1.5	50,000	1,500	0.01	0.15	50,000	1,300	0.01	0.12	50,000	1,000	0.01	0.08
4005-010005		R0.1	0.5	50,000	1,900	0.02	0.15	50,000	1,700	0.02	0.12	50,000	1,400	0.01	0.08
4005-010015			1.5	50,000	1,900	0.02	0.15	50,000	1,700	0.02	0.12	50,000	1,400	0.01	0.08
4005-015005		R0.15	0.5	50,000	2,200	0.03	0.15	50,000	2,000	0.03	0.12	50,000	1,800	0.01	0.08
4005-015015			1.5	50,000	2,200	0.03	0.15	50,000	2,000	0.03	0.12	50,000	1,800	0.01	0.08
4006-005005	0.6	R0.05	0.5	50,000	1,700	0.01	0.2	50,000	1,500	0.01	0.15	50,000	1,200	0.01	0.1
4006-010005		R0.1	0.5	50,000	2,300	0.02	0.2	50,000	2,000	0.02	0.15	50,000	1,700	0.012	0.1
4006-010010			1	50,000	2,300	0.02	0.2	50,000	2,000	0.02	0.15	50,000	1,700	0.012	0.1
4008-005010	0.8	R0.05	1	45,000	1,800	0.01	0.28	44,000	1,600	0.01	0.21	42,000	1,300	0.01	0.13
4008-010010		R0.1	1	45,000	2,400	0.02	0.28	44,000	2,000	0.02	0.21	42,000	1,600	0.015	0.13
4008-010020			2	45,000	2,400	0.02	0.28	44,000	2,000	0.02	0.21	42,000	1,600	0.015	0.13
4008-010050			5	45,000	1,700	0.02	0.14	44,000	1,400	0.02	0.11	42,000	1,100	0.015	0.07
4008-020010		R0.2	1	45,000	2,400	0.04	0.28	44,000	2,100	0.04	0.21	42,000	1,800	0.015	0.13
4010-002010	1	R0.02	1	40,000	1,300	0.006	0.35	37,000	1,100	0.006	0.3	34,000	900	0.005	0.2
4010-002030			3	40,000	1,300	0.006	0.35	37,000	1,100	0.006	0.3	34,000	900	0.005	0.2
4010-005010		R0.05	1	40,000	1,900	0.015	0.35	37,000	1,600	0.015	0.3	34,000	1,200	0.01	0.2
4010-005020			2	40,000	1,900	0.015	0.35	37,000	1,600	0.015	0.3	34,000	1,200	0.01	0.2
4010-010010		R0.1	1	40,000	2,600	0.03	0.35	37,000	2,000	0.03	0.3	34,000	1,400	0.015	0.2
4010-010020			2	40,000	2,600	0.03	0.35	37,000	2,000	0.03	0.3	34,000	1,400	0.015	0.2
4010-010030			3	40,000	2,600	0.03	0.35	37,000	2,000	0.03	0.3	34,000	1,400	0.015	0.2
4010-020020		R0.2	2	40,000	2,600	0.05	0.35	37,000	2,200	0.05	0.3	34,000	1,800	0.015	0.2
4015-002030	1.5	R0.02	3	30,000	1,500	0.01	0.55	27,000	1,300	0.01	0.5	23,000	1,100	0.005	0.3
4015-010030		R0.1	3	30,000	3,000	0.05	0.55	27,000	2,200	0.05	0.5	23,000	1,400	0.02	0.3
4015-030030		R0.3	3	30,000	3,000	0.07	0.55	27,000	2,400	0.07	0.5	23,000	1,700	0.02	0.3
4015-050030		R0.5	3	30,000	3,000	0.1	0.45	27,000	2,500	0.1	0.4	23,000	2,000	0.02	0.3

Milling Conditions for CBN-LRF (4 Flutes)

WORK MATERIAL				HEAT-TREATED STEELS / HARDENED STEELS STAVAX (~52HRC)				HARDENED STEELS SKD11 (~62HRC)				HARDENED STEELS HAP10 / HAP72 (~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)
4020-002040	2	R0.02	4	28,000	1,700	0.01	0.7	23,000	1,500	0.01	0.6	18,000	1,200	0.005	0.4
4020-002060			6	28,000	1,700	0.01	0.7	23,000	1,500	0.01	0.6	18,000	1,200	0.005	0.4
4020-002100			10	28,000	1,700	0.01	0.7	23,000	1,500	0.01	0.6	18,000	1,200	0.005	0.4
4020-005060		R0.05	6	28,000	2,500	0.025	0.7	23,000	1,900	0.025	0.6	18,000	1,300	0.015	0.4
4020-005100			10	28,000	2,500	0.025	0.7	23,000	1,900	0.025	0.6	18,000	1,300	0.015	0.4
4020-010040		R0.1	4	28,000	3,300	0.05	0.7	23,000	2,400	0.05	0.6	18,000	1,500	0.03	0.4
4020-010060			6	28,000	3,300	0.05	0.7	23,000	2,400	0.05	0.6	18,000	1,500	0.03	0.4
4020-010100			10	28,000	3,300	0.05	0.7	23,000	2,400	0.05	0.6	18,000	1,500	0.03	0.4
4020-020040		R0.2	4	28,000	3,300	0.07	0.7	23,000	2,500	0.07	0.6	18,000	1,600	0.03	0.4
4020-020060			6	28,000	3,300	0.07	0.7	23,000	2,500	0.07	0.6	18,000	1,600	0.03	0.4
4020-020100			10	28,000	3,300	0.07	0.7	23,000	2,500	0.07	0.6	18,000	1,600	0.03	0.4
4020-050060		R0.5	6	28,000	3,300	0.1	0.7	23,000	2,600	0.1	0.6	18,000	1,800	0.03	0.4
4020-050100			10	28,000	3,300	0.1	0.7	23,000	2,600	0.1	0.6	18,000	1,800	0.03	0.4
4030-005060	3	R0.05	6	23,000	3,000	0.025	1.1	18,000	2,200	0.025	0.9	13,000	1,300	0.015	0.6
4030-005100			10	23,000	3,000	0.025	1.1	18,000	2,200	0.025	0.9	13,000	1,300	0.015	0.6
4030-005150			15	23,000	2,100	0.02	1.1	18,000	1,700	0.02	0.9	13,000	1,200	0.01	0.6
4030-010060		R0.1	6	23,000	3,700	0.05	1.1	19,000	2,600	0.05	0.9	15,000	1,500	0.03	0.6
4030-010100			10	23,000	3,700	0.05	1.1	19,000	2,600	0.05	0.9	15,000	1,500	0.03	0.6
4030-010150			15	23,000	2,600	0.03	1.1	19,000	1,900	0.03	0.9	15,000	1,200	0.02	0.6
4030-020060		R0.2	6	23,000	3,700	0.07	1.1	20,000	2,700	0.07	0.9	16,000	1,600	0.03	0.6
4030-020100			10	23,000	3,700	0.07	1.1	20,000	2,700	0.07	0.9	16,000	1,600	0.03	0.6
4030-020150			15	23,000	2,600	0.03	1.1	20,000	1,900	0.03	0.9	16,000	1,200	0.02	0.6

Note:
- Decrease both spindle speed and feed rate proportionally when the milling parameters exceed the machine's maximum spindle speed.
- Recommend oil mist to avoid tool damage.



Advisory for Safe Use of End Mills

Correct application and operation is strongly advised to avoid clogging, abrasion, etc, that could cause serious accidents or injuries.
Ignition or sparks generated during milling could lead to fire or extreme damage to the work piece.
End Mills are made with very sharp cutting edges and must be handled with extra care.

- Never touch the cutting edge with your bare hands, as this could cause serious injury. Special caution is required when opening the package.
- Dropping the tool could cause breakage or flying debris, leading to serious injury.
- During milling, unexpected impact or shock on the tool could cause breakage or flying debris. Ensure to use protective items such as safety glasses and a face guard.
- For best results, fine parameter adjustment may be required, depending on the materials; milling shape and strategy; machine rigidity and spindle capability.
- Use a machine that has high rigidity and generates a low level of vibration. Recommend setting the runout control value at 5μm or below for the small diameter tools ϕ1 or below.
- Do not use flammable cutting oils.

Advisory for Regrinding End Mills

- Never regrind the tool without wearing safety glasses and a face guard.

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Price & Specifications are subject to change without notice.

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