

1 Flute CBN Long Neck Radius End Mills for Super Finishing



Size $\phi 0.2 \sim \phi 2$

CBN-RSF



Patented in Japan, Taiwan

CR ≤ 0.02

CR ≥ 0.05

Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

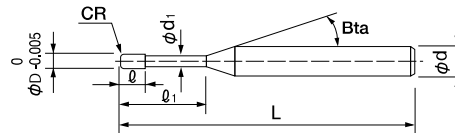
Work Material																	
Carbon Steels S45C S55C	Alloy Steels SK / SCM SUS	Prehardened Steels NAK HPM	Hardened Steels					Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
			~ 50HRC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

Label Sample

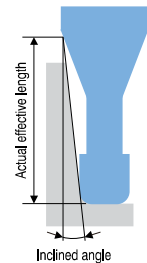


#001 $\phi D0.998 R+0.001/0.000$

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

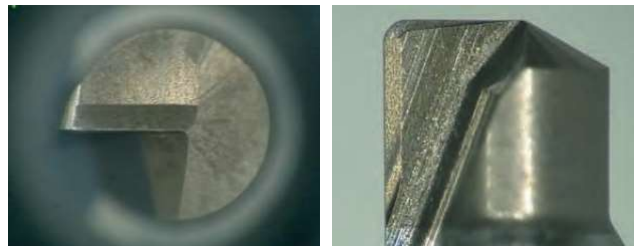


The shank taper angle shown is not an exact value and to avoid contact with the work piece, we recommend the user controls the precise value of this angle. Shank taper angle should not make contact with the work piece.



Features

The tool relief rubs against the milling surface to create a burnished finish.
1 flute design enables an even milling amount and prevents chip biting caused by runout.

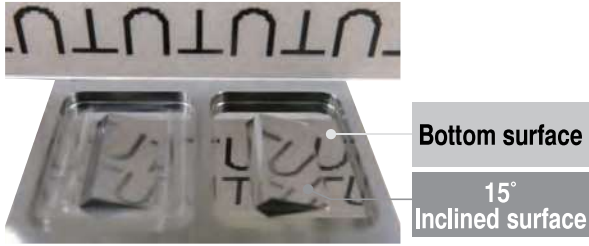


The cutting edge at the tip point has a burnishing effect. (ELMAX 60HRC)

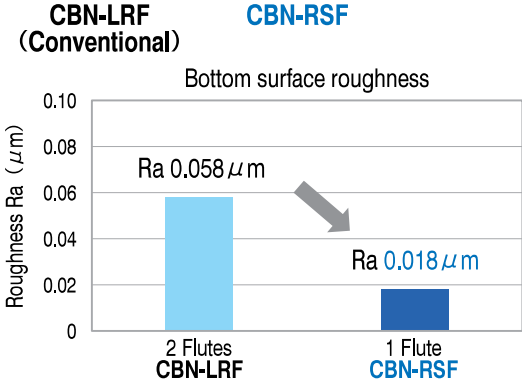
The unique design on the tool relief offers a shiny surface finish.



Inclined pocket milling
1 Flute CBN-RSF $\phi 2 \times CR0.1 \times EL4$ **ELMAX (60HRC)**



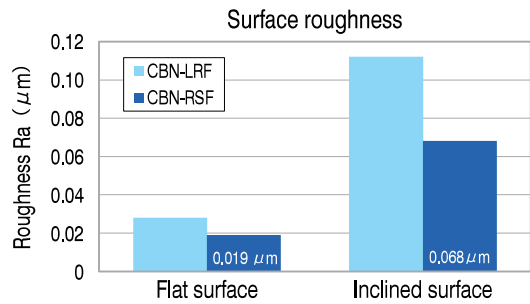
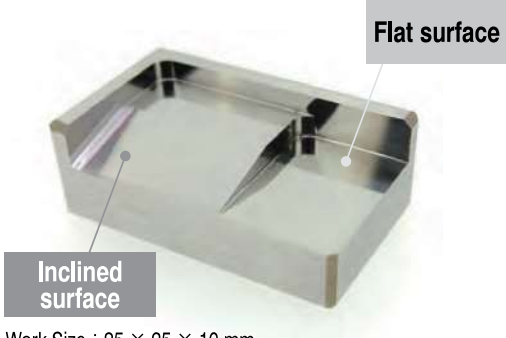
Process	Finishing
Milling Method	Contour Milling
Spindle Speed	30,000 min ⁻¹
Feed Rate	375 mm/min
Finishing Allowance	0.01 mm/min
Cusp Height at Inclined Surface	0.00003 mm
Cycle Time	61 min



Improved quality for milling on the bottom, inclined and vertical surfaces as compared to conventional CBN-LRF series.

Milled Size : 9 × 13 × Depth 1 mm
 Coolant : Oil Mist

Pocket milling
1 Flute CBN-RSF $\phi 2 \times CR0.1 \times EL4$ **ELMAX (60HRC)**



1 flute CBN-RSF gives excellent surface roughness

Work Size : 25 × 25 × 10 mm
 Coolant : Oil Mist

No.	Process	Tool	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a _p (mm)	a _e (mm)	Allowance (mm)	Cycle Time (h:m:s)
1	Roughing	HGLB R1 × EL4	14,000	2,100	0.15	0.5	0.05	0:10:17
2	Semi-finishing	HLRS $\phi 2 \times CR0.1 \times EL4$	11,500	860	0.031	0.36	0.05	1:11:50
					0.02	0.36	0.02	
					0.005	0.1	0.01	
3	Finishing	CBN-RSF $\phi 2 \times CR0.1 \times EL4$	30,000	375	0.01	0.1	0	2:25:01
Total								3:47:08

- φ3mm Shank V Series
- UDC-PCD Series
- CBN Series
- Square
- Long Neck Square
- Radius
- Long Neck Radius
- Taper Neck Radius
- Ball / Long Shank Ball
- Long Neck Ball
- Taper Neck Ball
- Taper
- Barrel
- Spiral V Cutter
- Drill
- Technical Data

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Total 42 models

*Shank taper angle Bta is only for reference.

Unit (mm)

- φ3mm Shank V Series
- UDC-PCD Series
- CBN Series**
- Square
- Long Neck Square
- Radius
- Long Neck Radius
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- Long Neck Ball
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- Barrel
- Spiral V Cutter
- Drill
- Technical Data

Model Number	Outside Diameter φD	Corner Radius CR	Effective Length ℓ ₁	Length of Cut ℓ	Neck Diameter φd ₁	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Suggested Retail Price ¥	Effective Length by Inclined Angles				
										30°	1°	1°30'	2°	3°
CBN-RSF 1002-002003	0.2	RO.02	0.3	0.08	0.19	15°	50	4	36,600	0.30	0.30	0.30	0.31	0.34
CBN-RSF 1002-002005			0.5				50	4	36,600	0.50	0.50	0.52	0.54	0.59
CBN-RSF 1002-005003		RO.05	0.3				50	4	32,900	0.30	0.30	0.30	0.31	0.33
CBN-RSF 1002-005005			0.5				50	4	32,900	0.50	0.50	0.52	0.54	0.58
CBN-RSF 1003-002005	0.3	RO.02	0.5	0.13	0.28	15°	50	4	36,200	0.51	0.53	0.55	0.57	0.62
CBN-RSF 1003-002010			1				50	4	36,600	1.03	1.07	1.11	1.15	1.25
CBN-RSF 1003-005005		RO.05	0.5				50	4	32,500	0.51	0.53	0.55	0.57	0.62
CBN-RSF 1003-005010			1				50	4	32,900	1.03	1.07	1.10	1.15	1.24
CBN-RSF 1004-002005	0.4	RO.02	0.5	0.24	0.38	15°	50	4	34,300	0.51	0.53	0.55	0.57	0.62
CBN-RSF 1004-002015			1.5				50	4	35,000	1.54	1.59	1.65	1.71	1.86
CBN-RSF 1004-005005		RO.05	0.5				50	4	30,900	0.51	0.53	0.55	0.57	0.62
CBN-RSF 1004-005015			1.5				50	4	31,100	1.54	1.59	1.65	1.71	1.85
CBN-RSF 1005-002005	0.5	RO.02	0.5	0.3	0.48	15°	50	4	28,200	0.51	0.53	0.55	0.57	0.62
CBN-RSF 1005-002015			1.5				50	4	28,700	1.54	1.59	1.65	1.71	1.86
CBN-RSF 1005-005005		RO.05	0.5				50	4	25,400	0.51	0.53	0.55	0.57	0.62
CBN-RSF 1005-005015			1.5				50	4	25,800	1.54	1.59	1.65	1.71	1.85
CBN-RSF 1006-002010	0.6	RO.02	1	0.3	0.58	15°	50	4	28,500	1.03	1.07	1.11	1.15	1.25
CBN-RSF 1006-002015			1.5				50	4	28,700	1.54	1.59	1.65	1.71	1.86
CBN-RSF 1006-005010		RO.05	1				50	4	25,600	1.03	1.07	1.10	1.15	1.24
CBN-RSF 1006-005015			1.5				50	4	25,800	1.54	1.59	1.65	1.71	1.85
CBN-RSF 1008-002010	0.8	RO.02	1	0.56	0.78	15°	50	4	28,700	1.03	1.07	1.11	1.15	1.25
CBN-RSF 1008-002020			2				50	4	28,700	2.05	2.13	2.20	2.29	2.48
CBN-RSF 1008-005010		RO.05	1				50	4	25,800	1.03	1.07	1.10	1.15	1.24
CBN-RSF 1008-005020			2				50	4	25,800	2.05	2.12	2.20	2.28	2.47
CBN-RSF 1010-002010	1	RO.02	1	0.7	0.98	15°	50	4	26,400	1.03	1.07	1.11	1.15	1.25
CBN-RSF 1010-002020			2				50	4	26,400	2.07	2.14	2.22	2.30	2.49
CBN-RSF 1010-002030			3				50	4	26,400	3.10	3.21	3.33	3.45	3.73
CBN-RSF 1010-005010		RO.05	1				50	4	23,700	1.03	1.07	1.11	1.15	1.24
CBN-RSF 1010-005020			2				50	4	23,700	2.06	2.14	2.21	2.30	2.48
CBN-RSF 1010-005030			3				50	4	23,700	3.10	3.21	3.32	3.45	3.73
CBN-RSF 1010-010010		RO.1	1				50	4	23,700	1.03	1.06	1.10	1.14	1.23
CBN-RSF 1010-010020			2				50	4	23,700	2.06	2.13	2.21	2.29	2.47
CBN-RSF 1010-010030	3		50	4	23,700	3.10	3.20	3.32	3.44	3.72				
CBN-RSF 1015-002030	1.5	RO.02	3	1	1.46	15°	50	4	31,000	3.14	3.25	3.37	3.49	3.78
CBN-RSF 1015-005030		RO.05	3				50	4	27,900	3.14	3.25	3.36	3.49	3.77
CBN-RSF 1015-010030		RO.1	3				50	4	27,900	3.14	3.24	3.36	3.48	3.76
CBN-RSF 1020-002040	2	RO.02	4	1.2	1.97	15°	50	4	32,000	4.15	4.30	4.45	4.62	5.00
CBN-RSF 1020-002060			6				50	4	32,000	6.22	6.44	6.67	6.92	7.49
CBN-RSF 1020-005040		RO.05	4				50	4	28,700	4.15	4.30	4.45	4.62	4.99
CBN-RSF 1020-005060			6				50	4	28,700	6.22	6.44	6.67	6.92	7.48
CBN-RSF 1020-010040		RO.1	4				50	4	28,700	4.15	4.29	4.45	4.61	4.98
CBN-RSF 1020-010060			6				50	4	28,700	6.22	6.43	6.66	6.91	7.47

Milling Conditions for CBN-RSF

WORK MATERIAL				HARDENED STEELS ELMAX (58~62HRC)				HARDENED STEELS HAP10 (62~65HRC)			
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)
1002-002003	0.2	R0.02	0.3	60,000	80 MAX	0.003	0.01	60,000	20 MAX	0.003	0.005
1002-002005			0.5	60,000	80 MAX	0.003	0.01	60,000	20 MAX	0.003	0.005
1002-005003		R0.05	0.3	60,000	80 MAX	0.003	0.01	60,000	20 MAX	0.003	0.005
1002-005005			0.5	60,000	80 MAX	0.003	0.01	60,000	20 MAX	0.003	0.005
1003-002005	0.3	R0.02	0.5	40,000	80 MAX	0.004	0.015	40,000	20 MAX	0.004	0.005
1003-002010			1	40,000	80 MAX	0.004	0.015	40,000	20 MAX	0.004	0.005
1003-005005		R0.05	0.5	40,000	80 MAX	0.004	0.015	40,000	20 MAX	0.004	0.005
1003-005010			1	40,000	80 MAX	0.004	0.015	40,000	20 MAX	0.004	0.005
1004-002005	0.4	R0.02	0.5	30,000	80 MAX	0.005	0.02	30,000	20 MAX	0.005	0.006
1004-002015			1.5	30,000	80 MAX	0.005	0.02	30,000	20 MAX	0.005	0.006
1004-005005		R0.05	0.5	30,000	100 MAX	0.005	0.02	30,000	60 MAX	0.005	0.02
1004-005015			1.5	30,000	100 MAX	0.005	0.02	30,000	60 MAX	0.005	0.02
1005-002005	0.5	R0.02	0.5	30,000	90 MAX	0.005	0.025	30,000	25 MAX	0.005	0.008
1005-002015			1.5	30,000	90 MAX	0.005	0.025	30,000	25 MAX	0.005	0.008
1005-005005		R0.05	0.5	30,000	100 MAX	0.01	0.025	30,000	60 MAX	0.01	0.025
1005-005015			1.5	30,000	100 MAX	0.01	0.025	30,000	60 MAX	0.01	0.025
1006-002010	0.6	R0.02	1	30,000	100 MAX	0.005	0.03	30,000	30 MAX	0.005	0.01
1006-002015			1.5	30,000	100 MAX	0.005	0.03	30,000	30 MAX	0.005	0.01
1006-005010		R0.05	1	30,000	110 MAX	0.01	0.03	30,000	65 MAX	0.01	0.03
1006-005015			1.5	30,000	110 MAX	0.01	0.03	30,000	65 MAX	0.01	0.03
1008-002010	0.8	R0.02	1	30,000	125 MAX	0.005	0.04	30,000	40 MAX	0.005	0.012
1008-002020			2	30,000	125 MAX	0.005	0.04	30,000	40 MAX	0.005	0.012
1008-005010		R0.05	1	30,000	140 MAX	0.01	0.04	30,000	85 MAX	0.01	0.04
1008-005020			2	30,000	140 MAX	0.01	0.04	30,000	85 MAX	0.01	0.04
1010-002010	1	R0.02	1	30,000	150 MAX	0.005	0.05	30,000	50 MAX	0.005	0.015
1010-002020			2	30,000	150 MAX	0.005	0.05	30,000	50 MAX	0.005	0.015
1010-002030			3	30,000	150 MAX	0.005	0.05	30,000	50 MAX	0.005	0.015
1010-005010		R0.05	1	30,000	165 MAX	0.01	0.05	30,000	100 MAX	0.01	0.04
1010-005020			2	30,000	165 MAX	0.01	0.05	30,000	100 MAX	0.01	0.04
1010-005030			3	30,000	165 MAX	0.01	0.05	30,000	100 MAX	0.01	0.04
1010-010010		R0.1	1	30,000	185 MAX	0.01	0.05	30,000	150 MAX	0.01	0.05
1010-010020			2	30,000	185 MAX	0.01	0.05	30,000	150 MAX	0.01	0.05
1010-010030	3	30,000	185 MAX	0.01	0.05	30,000	150 MAX	0.01	0.05		
1015-002030	1.5	R0.02	3	30,000	225 MAX	0.005	0.075	30,000	75 MAX	0.005	0.025
1015-005030		R0.05	3	30,000	250 MAX	0.01	0.075	30,000	150 MAX	0.01	0.05
1015-010030		R0.1	3	30,000	280 MAX	0.01	0.075	30,000	225 MAX	0.01	0.075
1020-002040	2	R0.02	4	30,000	300 MAX	0.005	0.1	30,000	100 MAX	0.005	0.03
1020-002060			6	30,000	300 MAX	0.005	0.1	30,000	100 MAX	0.005	0.03
1020-005040		R0.05	4	30,000	330 MAX	0.01	0.1	30,000	200 MAX	0.01	0.07
1020-005060			6	30,000	330 MAX	0.01	0.1	30,000	200 MAX	0.01	0.07
1020-010040		R0.1	4	30,000	375 MAX	0.01	0.1	30,000	300 MAX	0.01	0.1
1020-010060			6	30,000	375 MAX	0.01	0.1	30,000	300 MAX	0.01	0.1

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.

