VCSELB

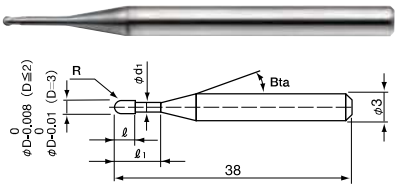
Value Series UTCOAT Longneck Ball

UTCOAT
2 Flutes Short Shank Long Neck Ball End Mills

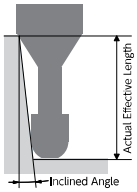
NEW

Super MG | UT COAT | Shank Dia 0/-0.003

0° R0.05~R0.075 | 30° R0.1~R1.5 | Back Taper Geometry: Except for R0.05~R0.15



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.



Radius of Ball Nose	Diameter Tolerance	Ball Radius Accuracy	Helix Angle
R0.05 ~ R0.075	0/-0.008	± 0.002	0°
R0.1 ~ R0.75		± 0.003	30°
R1		± 0.004	
R1.5	0/-0.01	± 0.005	

Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

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

Total 30 models

Unit (mm)

Model Number	Radius of Ball Nose R	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter ϕd1	Shank Taper Angle Bta	Effective Length by Inclined Angles 30′	1°	1° 30′	2°	3°	Suggested Retail Price ¥
VCSELB 2001-003	R0.05	0.3	0.08	0.094	11°	0.34	0.36	0.38	0.41	0.46	5,820
VCSELB 20015-003	R0.075	0.3	0.12	0.14	11°	0.37	0.39	0.41	0.43	0.48	6,730
VCSELB 2002-005	R0.1	0.5	0.16	0.18	11°	0.64	0.67	0.70	0.73	0.82	4,050
VCSELB 2002-010	R0.1	1	0.16	0.18	11°	1.16	1.21	1.28	1.34	1.50	4,050
VCSELB 2003-010	R0.15	1	0.24	0.28	11°	1.16	1.21	1.27	1.33	1.49	3,990
VCSELB 2003-020	R0.15	2	0.24	0.28	11°	2.20	2.30	2.42	2.55	2.85	4,280
VCSELB 2003-030	R0.15	3	0.24	0.28	11°	3.25	3.40	3.58	3.77	4.22	4,390
VCSELB 2004-010	R0.2	1	0.32	0.38	11°	1.16	1.21	1.26	1.32	1.47	2,740
VCSELB 2004-020	R0.2	2	0.32	0.38	11°	2.20	2.30	2.41	2.54	2.83	2,850
VCSELB 2004-030	R0.2	3	0.32	0.38	11°	3.24	3.40	3.57	3.76	4.20	3,140
VCSELB 2004-040	R0.2	4	0.32	0.38	11°	4.29	4.50	4.72	4.97	5.57	3,420
VCSELB 2005-020	R0.25	2	0.4	0.48	11°	2.19	2.29	2.40	2.52	2.81	2,740
VCSELB 2005-030	R0.25	3	0.4	0.48	11°	3.24	3.39	3.56	3.74	4.18	2,740
VCSELB 2005-040	R0.25	4	0.4	0.48	11°	4.29	4.49	4.71	4.96	5.55	2,740
VCSELB 2006-020	R0.3	2	0.48	0.58	11°	2.19	2.29	2.39	2.51	2.79	2,110
VCSELB 2006-030	R0.3	3	0.48	0.58	11°	3.24	3.39	3.55	3.73	4.16	2,170
VCSELB 2006-040	R0.3	4	0.48	0.58	11°	4.28	4.48	4.70	4.95	5.53	2,230
VCSELB 2006-060	R0.3	6	0.48	0.58	11°	6.38	6.68	7.02	7.39	8.27	2,230
VCSELB 2008-020	R0.4	2	0.64	0.78	11°	2.19	2.28	2.38	2.49	2.76	2,110
VCSELB 2008-040	R0.4	4	0.64	0.78	11°	4.28	4.47	4.69	4.93	5.50	2,230
VCSELB 2008-060	R0.4	6	0.64	0.78	11°	6.37	6.67	7.00	7.37	8.23	2,230

UTCOAT 2 Flutes Short Shank Long Neck Ball End Mills

Model Number	Radius of Ball Nose R	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Effective Length by Inclined Angles					Suggested Retail Price ¥
						30′	1°	1° 30′	2°	3°	
VCSELB 2010-030	R0.5	3	0.8	0.97	11°	3.26	3.40	3.55	3.73	4.13	2,000
VCSELB 2010-040	R0.5	4	0.8	0.97	11°	4.31	4.50	4.71	4.94	5.50	2,000
VCSELB 2010-050	R0.5	5	0.8	0.97	11°	5.35	5.60	5.87	6.16	6.87	2,000
VCSELB 2010-060	R0.5	6	0.8	0.97	11°	6.40	6.70	7.02	7.38	8.24	2,170
VCSELB 2015-040	R0.75	4	1.2	1.46	11°	4.25	4.42	4.62	4.84	5.35	2,050
VCSELB 2015-060	R0.75	6	1.2	1.46	11°	6.34	6.62	6.93	7.27	8.09	2,050
VCSELB 2020-040	R1	4	1.6	1.96	11°	4.24	4.40	4.58	4.78	5.26	2,000
VCSELB 2020-060	R1	6	1.6	1.96	11°	6.33	6.60	6.89	7.22	8.00	2,000
VCSELB 2030-060	R1.5	6	2.4	2.93	—	No Interference	No Interference	No Interference	No Interference	No Interference	2,170

VCSELB Milling Conditions

WORK MATERIAL			COPPER / ALUMINUM ALLOYS				CARBON STEELS / ALLOY STEELS S45C / S50C / SK / SCM (~325HB)				PREHARDENED STEELS NAK80 / STAVAX / HPM38 (30~45HRC)			
Model Number	Radius of Ball Nose (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)
2001-003	R0.05	0.3	54,000	85	0.004	0.004	54,000	85	0.004	0.004	48,000	55	0.002	0.002
20015-003	R0.075	0.3	54,000	160	0.007	0.009	54,000	160	0.007	0.009	48,000	90	0.004	0.004
2002-005	R0.1	0.5	60,000	350	0.008	0.024	60,000	350	0.008	0.016	60,000	300	0.008	0.024
2002-010	R0.1	1	60,000	250	0.006	0.018	60,000	250	0.005	0.015	60,000	250	0.006	0.018
2003-010	R0.15	1	43,000	450	0.01	0.03	43,000	450	0.008	0.024	54,000	400	0.01	0.03
2003-020	R0.15	2	40,000	300	0.006	0.018	40,000	300	0.006	0.018	50,000	300	0.007	0.021
2003-030	R0.15	3	38,000	200	0.004	0.012	38,000	200	0.004	0.012	42,000	200	0.004	0.012
2004-010	R0.2	1	35,000	1,200	0.03	0.09	35,000	1,200	0.02	0.04	50,000	650	0.025	0.075
2004-020	R0.2	2	35,000	600	0.015	0.045	35,000	600	0.011	0.033	50,000	500	0.015	0.045
2004-030	R0.2	3	35,000	400	0.01	0.03	35,000	400	0.008	0.024	42,000	400	0.01	0.03
2004-040	R0.2	4	35,000	300	0.005	0.015	35,000	300	0.005	0.015	35,000	300	0.005	0.015
2005-020	R0.25	2	34,000	800	0.025	0.075	34,000	800	0.023	0.046	45,000	700	0.022	0.066
2005-030	R0.25	3	32,000	550	0.016	0.048	32,000	550	0.012	0.036	41,000	550	0.014	0.042
2005-040	R0.25	4	31,000	450	0.012	0.036	31,000	450	0.01	0.03	35,000	450	0.01	0.03
2006-020	R0.3	2	33,000	1,400	0.045	0.135	33,000	1,400	0.036	0.072	40,000	1,200	0.045	0.09
2006-030	R0.3	3	33,000	900	0.035	0.105	33,000	900	0.025	0.066	40,000	800	0.03	0.075
2006-040	R0.3	4	31,000	700	0.027	0.081	31,000	700	0.02	0.06	35,000	560	0.022	0.066
2006-060	R0.3	6	24,000	380	0.012	0.036	24,000	380	0.012	0.036	24,000	380	0.01	0.03
2008-020	R0.4	2	30,000	2,200	0.1	0.3	30,000	1,800	0.06	0.12	35,000	1,800	0.07	0.14
2008-040	R0.4	4	30,000	1,400	0.07	0.21	30,000	1,300	0.04	0.1	35,000	1,300	0.05	0.12
2008-060	R0.4	6	27,000	900	0.04	0.12	27,000	900	0.025	0.075	27,000	800	0.03	0.09
2010-030	R0.5	3	30,000	1,800	0.11	0.33	24,000	1,600	0.07	0.14	30,000	1,500	0.08	0.16
2010-040	R0.5	4	30,000	1,700	0.09	0.27	24,000	1,500	0.065	0.13	30,000	1,300	0.075	0.15
2010-050	R0.5	5	30,000	1,600	0.08	0.24	24,000	1,400	0.06	0.12	30,000	1,200	0.07	0.14
2010-060	R0.5	6	30,000	1,400	0.06	0.18	18,000	1,200	0.04	0.12	30,000	1,100	0.06	0.12
2015-040	R0.75	4	30,000	1,800	0.14	0.42	30,000	1,500	0.11	0.22	30,000	1,600	0.11	0.22
2015-060	R0.75	6	30,000	1,800	0.12	0.36	23,000	1,300	0.1	0.2	30,000	1,400	0.1	0.2
2020-040	R1	4	30,000	2,000	0.2	0.6	30,000	2,000	0.21	0.42	30,000	2,000	0.2	0.6
2020-060	R1	6	30,000	2,000	0.2	0.6	30,000	2,000	0.21	0.42	30,000	2,000	0.2	0.6
2030-060	R1.5	6	24,000	2,500	0.32	0.9	24,000	2,500	0.32	0.9	24,000	2,500	0.3	0.9

VCSELB Milling Conditions

2 Flutes

WORK MATERIAL			HARDENED STEELS STAVAX / HPM38 / SKD61 (45~55HRC)			
Model Number	Radius of Ball Nose (mm)	Effective Length (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
2001-003	R0.05	0.3	48,000	55	0.002	0.002
20015-003	R0.075	0.3	48,000	90	0.004	0.004
2002-005	R0.1	0.5	60,000	300	0.006	0.018
2002-010	R0.1	1	60,000	220	0.005	0.015
2003-010	R0.15	1	43,000	400	0.007	0.021
2003-020	R0.15	2	40,000	300	0.005	0.015
2003-030	R0.15	3	38,000	200	0.004	0.008
2004-010	R0.2	1	35,000	650	0.015	0.045
2004-020	R0.2	2	35,000	400	0.01	0.03
2004-030	R0.2	3	35,000	330	0.007	0.021
2004-040	R0.2	4	35,000	250	0.005	0.015
2005-020	R0.25	2	32,000	700	0.016	0.048
2005-030	R0.25	3	31,000	500	0.012	0.036
2005-040	R0.25	4	30,000	390	0.01	0.03
2006-020	R0.3	2	30,000	1,200	0.036	0.054
2006-030	R0.3	3	30,000	900	0.026	0.052
2006-040	R0.3	4	28,000	600	0.018	0.054
2006-060	R0.3	6	24,000	380	0.008	0.024
2008-020	R0.4	2	25,000	1,700	0.07	0.1
2008-040	R0.4	4	25,000	1,200	0.045	0.09
2008-060	R0.4	6	23,000	800	0.023	0.069
2010-030	R0.5	3	21,500	1,400	0.08	0.12
2010-040	R0.5	4	21,500	1,300	0.075	0.1
2010-050	R0.5	5	21,500	1,200	0.06	0.09
2010-060	R0.5	6	21,500	1,100	0.05	0.1
2015-040	R0.75	4	18,000	1,400	0.11	0.17
2015-060	R0.75	6	15,000	1,200	0.1	0.16
2020-040	R1	4	16,000	1,300	0.17	0.5
2020-060	R1	6	14,000	1,100	0.15	0.4
2030-060	R1.5	6	14,000	1,400	0.25	0.76

Note:
- Decrease the feed rate more than 50% from the milling parameters when slot milling.
- Decrease both spindle speed and feed rate proportionally when the milling parameters exceed the machine's maximum spindle speed, or when the tool is chattering and heats up to a red color.
- Recommend oil coolant for Stainless Steels and Heat Resistant Alloys.
- Recommend wet coolant for Copper.