

High-Performance End Mill Series

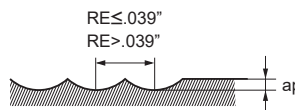
VQ2XLB

Ball nose, Short cut length, 2 flute, Long neck

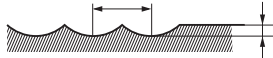
RECOMMENDED CUTTING CONDITIONS

Material				Titanium Alloys					Cobalt Chromium Alloys, Precipitation Hardening Stainless Steel					Pure Titanium				
RE		LU		Revolution	Cutting Speed	Table Feed	Depth of cut	Width of cut	Revolution	Cutting Speed	Table Feed	Depth of cut	Width of cut	Revolution	Cutting Speed	Table Feed	Depth of cut	Width of cut
(mm)	(inch)	(mm)	(inch)	n (min ⁻¹)	vc (SFM)	vf (IPM)	ap (inch)	ae (inch)	n (min ⁻¹)	vc (SFM)	vf (IPM)	ap (inch)	ae (inch)	n (min ⁻¹)	vc (SFM)	vf (IPM)	ap (inch)	ae (inch)
0.198	.0078	1.189	.0468	165	40000	47.2	.0008	.0016	165	40000	47.2	.0008	.0016	165	40000	37.8	.0012	.0016
0.198	.0078	1.981	.0780	165	40000	37.8	.0008	.0016	165	40000	37.8	.0008	.0016	165	40000	29.9	.0012	.0016
0.198	.0078	3.170	.1248	165	40000	26	.0008	.0016	165	40000	26	.0008	.0016	165	40000	20.9	.0012	.0016
0.200	.0079	1.200	.0472	165	40000	47.2	.0008	.0016	165	40000	47.2	.0008	.0016	165	40000	37.8	.0012	.0016
0.200	.0079	2.000	.0787	165	40000	37.8	.0008	.0016	165	40000	37.8	.0008	.0016	165	40000	29.9	.0012	.0016
0.200	.0079	3.200	.1260	165	40000	26	.0008	.0016	165	40000	26	.0008	.0016	165	40000	20.9	.0012	.0016
0.250	.0098	1.500	.0591	205	40000	78.7	.0012	.0020	205	40000	78.7	.0012	.0020	205	40000	63	.0020	.0020
0.250	.0098	2.500	.0984	205	40000	59.1	.0012	.0020	205	40000	59.1	.0012	.0020	205	40000	47.2	.0020	.0020
0.250	.0098	4.000	.1575	205	40000	39.4	.0012	.0020	205	40000	39.4	.0012	.0020	205	40000	31.5	.0020	.0020
0.254	.0100	1.524	.0600	210	40000	78.7	.0012	.0020	210	40000	78.7	.0012	.0020	210	40000	63	.0020	.0020
0.254	.0100	2.540	.1000	210	40000	59.1	.0012	.0020	210	40000	59.1	.0012	.0020	210	40000	47.2	.0020	.0020
0.254	.0100	4.064	.1600	210	40000	39.4	.0012	.0020	210	40000	39.4	.0012	.0020	210	40000	31.5	.0020	.0020
0.300	.0118	1.800	.0709	245	40000	102.4	.0012	.0024	245	40000	102.4	.0012	.0024	245	40000	78.7	.0020	.0024
0.300	.0118	3.000	.1181	245	40000	78.7	.0012	.0024	245	40000	78.7	.0012	.0024	245	40000	63	.0020	.0024
0.300	.0118	4.800	.1890	245	40000	55.1	.0012	.0024	245	40000	55.1	.0012	.0024	245	40000	43.3	.0020	.0024
0.318	.0125	1.905	.0750	260	40000	102.4	.0012	.0024	260	40000	102.4	.0012	.0024	260	40000	78.7	.0020	.0024
0.318	.0125	3.175	.1250	260	40000	78.7	.0012	.0024	260	40000	78.7	.0012	.0024	260	40000	63	.0020	.0024
0.318	.0125	5.080	.2000	260	40000	55.1	.0012	.0024	260	40000	55.1	.0012	.0024	260	40000	43.3	.0020	.0024
0.350	.0138	2.100	.0827	285	40000	126	.0016	.0028	260	36000	110.2	.0016	.0028	260	36000	86.6	.0024	.0028
0.350	.0138	3.500	.1378	285	40000	98.4	.0016	.0028	260	36000	86.6	.0016	.0028	260	36000	70.9	.0024	.0028
0.350	.0138	5.600	.2205	285	40000	66.9	.0016	.0028	260	36000	59.1	.0016	.0028	260	36000	47.2	.0024	.0028
0.381	.0150	2.286	.0900	310	40000	137.8	.0016	.0028	260	33000	110.2	.0016	.0028	260	33000	94.5	.0024	.0028
0.381	.0150	3.810	.1500	310	40000	106.3	.0016	.0028	260	33000	90.6	.0016	.0028	260	33000	70.9	.0024	.0028
0.381	.0150	6.096	.2400	310	40000	74.8	.0016	.0028	260	33000	63	.0016	.0028	260	33000	47.2	.0024	.0028
0.398	.0157	2.385	.0939	330	40000	137.8	.0016	.0031	260	32000	110.2	.0016	.0031	260	32000	102.4	.0024	.0031
0.398	.0157	3.975	.1565	330	40000	118.1	.0016	.0031	260	32000	98.4	.0016	.0031	260	32000	78.7	.0024	.0031
0.398	.0157	6.360	.2504	330	40000	82.7	.0016	.0031	260	32000	66.9	.0016	.0031	260	32000	55.1	.0024	.0031
0.400	.0157	2.400	.0945	330	40000	137.8	.0016	.0031	260	32000	110.2	.0016	.0031	260	32000	102.4	.0024	.0031
0.400	.0157	4.000	.1575	330	40000	118.1	.0016	.0031	260	32000	98.4	.0016	.0031	260	32000	78.7	.0024	.0031
0.400	.0157	6.400	.2520	330	40000	82.7	.0016	.0031	260	32000	66.9	.0016	.0031	260	32000	55.1	.0024	.0031
0.445	.0175	2.667	.1050	330	36000	137.8	.0016	.0031	260	29000	110.2	.0016	.0031	260	29000	102.4	.0024	.0031
0.445	.0175	4.445	.1750	330	36000	118.1	.0016	.0031	260	29000	98.4	.0016	.0031	260	29000	78.7	.0024	.0031
0.445	.0175	7.112	.2800	330	36000	82.7	.0016	.0031	260	29000	66.9	.0016	.0031	260	29000	55.1	.0024	.0031
0.500	.0197	3.000	.1181	330	32000	137.8	.0020	.0039	260	25000	110.2	.0020	.0039	260	27000	98.4	.0031	.0039
0.500	.0197	5.000	.1969	330	32000	118.1	.0020	.0039	260	25000	94.5	.0020	.0039	260	27000	78.7	.0031	.0039
0.500	.0197	8.000	.3150	330	32000	98.4	.0020	.0039	260	25000	78.7	.0020	.0039	260	27000	63	.0031	.0039
0.500	.0197	10.000	.3937	245	24000	59.1	.0020	.0039	195	19000	59.1	.0020	.0039	195	19000	47.2	.0031	.0039
0.500	.0197	12.000	.4724	245	24000	59.1	.0012	.0039	195	19000	59.1	.0012	.0039	195	19000	47.2	.0016	.0039
0.508	.0200	3.048	.1200	330	31000	137.8	.0020	.0039	260	25000	110.2	.0020	.0039	260	25000	98.4	.0031	.0039
0.508	.0200	5.080	.2000	330	31000	118.1	.0020	.0039	260	25000	94.5	.0020	.0039	260	25000	78.7	.0031	.0039
0.508	.0200	8.128	.3200	330	31000	82.7	.0020	.0039	260	25000	78.7	.0020	.0039	260	25000	63	.0031	.0039
0.572	.0225	3.429	.1350	330	28000	141.7	.0024	.0051	260	22000	110.2	.0024	.0039	260	22000	86.6	.0039	.0047
0.572	.0225	5.715	.2250	330	28000	110.2	.0024	.0051	260	22000	86.6	.0024	.0039	260	22000	70.9	.0039	.0047
0.572	.0225	9.144	.3600	330	28000	78.7	.0024	.0051	260	22000	59.1	.0024	.0039	260	22000	47.2	.0039	.0047
0.596	.0235	3.574	.1407	330	27000	141.7	.0028	.0059	260	21000	106.3	.0028	.0039	295	24000	94.5	.0043	.0055
0.596	.0235	5.956	.2345	330	27000	110.2	.0028	.0051	260	21000	82.7	.0028	.0039	295	24000	74.8	.0043	.0055
0.596	.0235	9.530	.3752	330	27000	78.7	.0028	.0051	260	21000	59.1	.0028	.0039	260	21000	47.2	.0043	.0055

Depth of Cut



RE : Radius

Material				Titanium Alloys					Cobalt Chromium Alloys, Precipitation Hardening Stainless Steel					Pure Titanium				
				Revolution n (min ⁻¹)	Cutting Speed vc (SFM)	Table Feed vf (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution n (min ⁻¹)	Cutting Speed vc (SFM)	Table Feed vf (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution n (min ⁻¹)	Cutting Speed vc (SFM)	Table Feed vf (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
RE	LU			(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	
(mm)	(inch)	(mm)	(inch)															
0.635	0.0250	3.810	.1500	330	25000	133.9	.0031	.0079	260	20000	102.4	.0031	.0039	330	25000	102.4	.0051	.0063
0.635	0.0250	6.350	.2500	330	25000	102.4	.0031	.0079	260	20000	78.7	.0031	.0039	330	25000	78.7	.0051	.0063
0.635	0.0250	10.160	.4000	330	25000	70.9	.0031	.0079	260	20000	55.1	.0031	.0039	295	23000	51.2	.0051	.0063
0.699	0.0275	4.191	.1650	330	23000	122	.0039	.0098	260	18000	98.4	.0031	.0039	360	25000	106.3	.0051	.0071
0.699	0.0275	6.985	.2750	330	23000	94.5	.0039	.0098	260	18000	74.8	.0031	.0039	360	25000	82.7	.0051	.0071
0.699	0.0275	11.176	.4400	330	23000	66.9	.0039	.0098	260	18000	51.2	.0031	.0039	295	20000	47.2	.0051	.0071
0.750	0.0295	10.000	.3937	330	21000	82.7	.0051	.0118	260	17000	66.9	.0031	.0039	395	25000	78.7	.0051	.0079
0.750	0.0295	12.000	.4724	245	16000	59.1	.0051	.0118	195	13000	47.2	.0031	.0039	330	21000	63	.0051	.0079
0.762	0.0300	4.572	.1800	330	21000	118.1	.0051	.0118	260	17000	94.5	.0031	.0039	395	25000	102.4	.0051	.0079
0.762	0.0300	7.620	.3000	330	21000	90.6	.0051	.0118	260	17000	70.9	.0031	.0039	395	25000	78.7	.0051	.0079
0.762	0.0300	12.192	.4800	330	21000	63	.0051	.0118	260	17000	51.2	.0031	.0039	330	21000	63	.0051	.0079
0.794	0.0313	4.763	.1875	330	20000	106.3	.0055	.0157	260	16000	86.6	.0039	.0059	460	28000	118.1	.0063	.0118
0.794	0.0313	7.938	.3125	330	20000	82.7	.0055	.0157	260	16000	66.9	.0039	.0059	460	28000	90.6	.0063	.0118
0.794	0.0313	12.700	.5000	330	20000	59.1	.0055	.0157	260	16000	47.2	.0039	.0059	395	24000	63	.0063	.0118
0.889	0.0350	5.334	.2100	330	18000	102.4	.0063	.0177	260	14000	82.7	.0059	.0118	560	30000	118.1	.0094	.0197
0.889	0.0350	8.890	.3500	330	18000	78.7	.0063	.0177	260	14000	63	.0059	.0118	560	30000	90.6	.0094	.0197
0.889	0.0350	14.224	.5600	330	18000	55.1	.0063	.0177	260	14000	43.3	.0059	.0118	490	27000	63	.0094	.0197
0.992	0.0391	5.951	.2343	330	16000	90.6	.0079	.0197	260	13000	78.7	.0079	.0197	655	32000	126	.0126	.0315
0.992	0.0391	9.919	.3905	330	16000	70.9	.0079	.0197	260	13000	59.1	.0079	.0197	655	32000	98.4	.0126	.0315
0.992	0.0391	15.870	.6248	330	16000	51.2	.0079	.0197	260	13000	43.3	.0079	.0197	590	29000	66.9	.0126	.0315
1.000	0.0394	10.000	.3937	330	16000	70.9	.0079	.0197	260	13000	59.1	.0079	.0197	655	32000	98.4	.0126	.0315
1.000	0.0394	12.000	.4724	330	16000	70.9	.0079	.0197	260	13000	59.1	.0079	.0197	590	29000	66.9	.0126	.0315
1.500	0.0591	12.000	.4724	330	10000	63	.0118	.0315	260	8500	51.2	.0118	.0315	655	21000	63	.0189	.0472
1.500	0.0591	14.000	.5512	330	10000	63	.0118	.0315	260	8500	51.2	.0118	.0315	655	21000	63	.0189	.0472
1.500	0.0591	16.000	.6299	330	10000	63	.0118	.0315	260	8500	51.2	.0118	.0315	655	21000	63	.0189	.0472
Depth of Cut				RE ≤ .039" RE > .039" 														
				RE : Radius														

Note 1) The SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electrically transmitted) may not work.

When measuring the tool length, please use an internal contact type (non-electrical type) or a laser tool setter.

Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.

Note 3) If the depth of cut is shallow, the revolution and the feed rate can be increased.