



- Endmills for pre-hardened and hardened steel (Hrc50~65)
- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- High speed, feed applicable by 4 flute ball edge.
- Minimize fracturing by high TRS fine(0.5 μm) WC grade.

4

WC

TISIN
Coating

R
±0.005
0.5 ~ 2.5R

R
±0.01
3 ~ 6R

R
±0.01
8 ~ 10R

30°
Helix Angle

D Size	D Tolerance
Ø1 ~ 5	+0 ~ -0.01 mm
Ø6 ~ 12	-0.005 ~ -0.015 mm
Ø16 ~ 20	-0.01 ~ -0.02 mm

: mm

3HCB / 4HSB / 4HCB

■ Use the same RPM, reduce the feed rate up to 20% for 3HCB

Material	Copper				Prehardened Steel / Hardened Steel				Hardened Steels				Hardened Steels			
	Hardness				30 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	41,000	1990	0.063	0.040	38,540	1870	0.100	0.300	36,900	1500	0.080	0.240	27,300	1120	0.050	0.140
R 0.75	27,000	2740	0.087	0.068	25,380	1920	0.150	0.450	28,700	1530	0.120	0.360	21,500	1150	0.075	0.210
R 1	32,700	4200	0.112	0.089	30,738	2220	0.200	0.600	24,600	1770	0.160	0.480	18,250	1330	0.100	0.280
R 1.25	30,600	4400	0.067	0.115	28,764	1920	0.250	0.542	27,901	1540	0.200	0.430	15,500	1150	0.125	0.251
R 1.5	26,100	5280	0.197	0.171	24,534	3020	0.300	0.957	23,798	1820	0.240	0.766	15,500	1840	0.150	0.447
R 2	18,800	4990	0.266	0.208	17,672	2940	0.400	1.380	17,142	1850	0.320	1.100	12,800	1760	0.200	0.644
R 2.5	17,300	4770	0.215	0.240	16,262	3070	0.500	1.660	15,774	1870	0.400	1.330	11,000	1800	0.250	0.770
R 3	16,500	4650	0.290	0.281	15,510	3240	0.600	2.340	15,045	1900	0.480	1.870	9,600	2000	0.300	1.090
R 4	11,660	4800	0.400	0.175	10,960	2760	0.800	3.100	10,632	1820	0.640	2.480	7,600	1650	0.400	1.446
R 5	9,560	4920	0.500	0.154	8,986	2640	1.000	3.750	8,717	1850	0.800	3.000	6,400	1600	0.500	1.750
R 6	7,100	4800	0.600	0.159	6,674	2220	1.200	4.420	6,474	1770	0.960	3.540	5,450	1650	0.600	2.060
R 8	4,650	3900	0.115	0.450	4,371	1950	3.870	1.120	4,240	1760	2.350	0.790	4,000	1670	1.742	0.500
R 10	3,200	3950	0.100	0.400	3,008	1740	4.120	1.100	2,918	1750	2.530	0.840	3,100	1680	1.866	0.520

Depth of Cut

- Ap : Axial Depth
- Ae : Radial Depth
- D : Outside Diameter
- n : Speed
- Vf : Feed

- If the effective length is long, reduce the RPM and feed in the same proportion.
- The parameters on the table is based on 4flutes. For using 3 flutes (3HCB), use the same RPM and reduce the feed maximum 20% in stable milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5 μm).
- Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.