

2ERR						Cutting Conditions							
Material		Copper Alloys C1100				Alloy Steels / Pre-hardened Steels NAK80/KP4M				Hardened Steels STAVAX/SKD11			
Hardness						40~ 45HRC				45 ~ 55HRC			
Outside Dia	Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
Ø 0.6	2	27,945	890	0.111	0.158	27,945	668	0.010	0.214	23,000	534	0.010	0.214
"	6	16,445	435	0.035	0.044	16,445	326	0.003	0.010	13,570	261	0.003	0.010
Ø 0.8	4	17,250	787	0.129	0.194	17,020	590	0.014	0.114	14,720	472	0.015	0.114
"	8	12,650	475	0.029	0.098	12,650	264	0.005	0.088	10,695	184	0.004	0.088
Ø 1	4	13,800	1449	0.196	0.396	13,800	805	0.034	0.264	11,730	655	0.029	0.264
"	10	8,625	559	0.047	0.308	8,625	311	0.013	0.123	7,475	264	0.011	0.123
"	16	6,900	331	0.018	0.220	6,900	184	0.005	0.026	5,980	161	0.004	0.026
Ø 1.2	6	9,200	1,035	0.182	0.457	9,200	575	0.021	0.088	8,165	483	0.018	0.088
"	12	6,670	662	0.053	0.396	6,670	368	0.010	0.070	5,980	299	0.007	0.070
Ø 1.5	4	12,880	1925	0.293	0.660	12,880	1070	0.059	0.440	11,730	920	0.044	0.440
"	10	8,280	1325	0.147	0.554	8,280	736	0.041	0.282	7,590	633	0.031	0.282
"	20	5,865	725	0.041	0.352	6,350	403	0.006	0.106	4,160	345	0.005	0.106
Ø 2	6	12,535	1801	0.314	0.836	12,535	1001	0.059	0.792	11,730	909	0.042	0.792
"	12	9,200	1449	0.182	0.704	9,200	805	0.043	0.440	8,280	725	0.030	0.440
"	20	6,900	1139	0.091	0.651	6,200	633	0.023	0.194	3,520	564	0.017	0.194
"	30	5,865	973	0.049	0.440	3,300	541	0.005	0.132	2,860	495	0.005	0.132
Ø 2.5	10	10,350	1801	0.331	0.836	10,350	1001	0.073	0.528	9,775	943	0.051	0.528
"	30	6,210	787	0.067	0.616	6,210	437	0.016	0.176	5,865	414	0.011	0.176
Ø 3	12	10,350	2029	0.381	0.831	10,350	1127	0.103	0.655	9,775	874	0.103	0.616
"	20	8,165	1553	0.254	0.762	6,050	863	0.071	0.567	3,420	667	0.071	0.567
"	30	6,900	1263	0.137	0.674	3,300	702	0.049	0.371	2,890	541	0.049	0.371
Ø 4	12	8,740	1904	0.401	1.525	8,740	1058	0.117	1.124	7,360	920	0.081	1.124
"	20	6,785	1458	0.375	1.325	5,880	810	0.078	0.880	5,750	840	0.053	0.880
"	30	5,750	752	0.196	1.210	2,950	418	0.041	0.671	2,540	656	0.028	0.671
"	45	4,715	500	0.096	1.118	2,300	278	0.010	0.326	2,015	322	0.007	0.326
Ø 5	15	7,705	3064	0.697	2.277	7,705	1702	0.150	1.346	5,520	1139	0.106	1.346
"	30	5,290	1470	0.342	1.760	2,780	817	0.075	1.035	3,795	541	0.053	1.035
Ø 6	20	5,980	2194	0.600	2.194	5,460	1219	0.476	1.356	3,565	1035	0.186	1.356
"	40	4,600	1635	0.565	2.049	2,380	909	0.410	1.304	2,160	759	0.164	1.304
Ø 8	22	5,520	1946	0.528	2.542	5,520	1081	0.419	1.518	3,220	909	0.164	1.518
"	40	4,140	1449	0.497	2.277	2,120	805	0.361	1.323	2,080	667	0.144	1.323
Ø 10	24	4,600	1656	0.449	2.887	4,485	920	0.356	1.645	2,760	771	0.139	1.645
"	45	3,450	1221	0.423	2.438	3,450	679	0.307	1.334	1,955	564	0.122	1.334
Ø 12	26	3,795	1387	0.377	3.013	3,795	771	0.299	2.024	2,300	644	0.117	2.024
"	50	2,875	1035	0.355	2.415	2,875	575	0.258	1.403	1,725	483	0.103	1.403
Ø 16	35	2,990	1097	0.302	2.921	2,990	610	0.239	2.162	1,725	518	0.094	2.162
Depth of cut		Slotting • Ap : Axial Depth • D : Outside Diameter				Side Milling • Ap : Axial Depth • Ae : Radial Depth				Inclined Cutting			

- Use a rigid precise machine and holder.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- If the effective length or overall length of your tool are not show above the table, adjust your parameter with upper or lower diameter of parameter.
- When milling workpiece HRC over 50 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- Consider the corner radius value when you set up the Ae value.
- 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 5µm).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.
- The Above condition are only reference. In actual machining conditions adjust these parameters according to the milling shape, machine ability and the operation environment.