

2HTB						Cutting Condition								
Material			Alloy Steels / Prehardened Steels NAK80/KP4M			Hardened Steels STAVX / SKD11			Heat-treated Steels / Hardened Steels SKD11 / SKD61			Heat-treated Steels / Hardened Steels YXR7 / SKH51		
Hardness			40 ~ 45HRC			45 ~ 55HRC			55 ~ 62HRC			62 ~ 70HRC		
Radius	Effective Length	Taper Angle	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
R 0.25	4	0°30	34,650	1,187	0.019	28,350	861	0.015	24,675	630	0.013	24,675	609	0.011
"	6	0°30	21,525	609	0.006	17,850	431	0.005	15,750	368	0.004	15,750	326	0.003
"	4	1°	34,650	1,187	0.019	28,350	861	0.015	24,675	630	0.013	24,675	609	0.011
"	6	1°	21,525	609	0.006	17,850	431	0.005	15,750	368	0.004	15,750	326	0.003
"	8	1°	21,525	609	0.005	17,850	431	0.004	15,750	368	0.003	15,750	326	0.003
"	10	1°	21,525	609	0.004	17,850	431	0.003	15,750	368	0.003	15,750	326	0.003
"	4	1°30	34,650	1,187	0.019	28,350	861	0.015	24,675	630	0.013	24,675	609	0.011
"	6	1°30	21,525	609	0.008	17,850	431	0.005	15,750	368	0.006	15,750	326	0.005
"	8	1°30	21,525	609	0.007	17,850	431	0.005	15,750	368	0.005	15,750	326	0.004
"	10	1°30	21,525	609	0.006	17,850	431	0.005	15,750	368	0.004	15,750	326	0.003
"	4	2°	34,650	1,187	0.019	28,350	861	0.015	24,675	630	0.013	24,675	609	0.011
"	6	2°	21,525	609	0.006	17,850	431	0.005	15,750	368	0.004	15,750	326	0.003
"	8	2°	21,525	609	0.006	17,850	431	0.005	15,750	368	0.004	15,750	326	0.003
"	10	2°	21,525	609	0.006	17,850	431	0.005	15,750	368	0.004	15,750	326	0.003
R 0.3	4	0°30	43,050	2,142	0.032	31,500	1,418	0.022	23,625	788	0.021	23,625	704	0.016
"	8	0°30	26,775	998	0.016	22,050	735	0.013	16,800	515	0.011	16,800	410	0.008
"	12	0°30	26,250	893	0.008	22,575	714	0.006	14,700	399	0.005	13,650	336	0.004
"	4	1°	43,050	2,142	0.032	31,500	1,418	0.022	23,625	788	0.021	23,625	704	0.016
"	8	1°	26,775	998	0.020	22,050	735	0.015	16,800	515	0.013	16,800	410	0.009
"	12	1°	26,250	893	0.010	22,575	714	0.012	14,700	399	0.008	13,650	336	0.005
R 0.3	4	1°30	43,050	2,142	0.032	31,500	1,418	0.022	23,625	788	0.021	23,625	704	0.016
"	8	1°30	26,775	998	0.016	22,050	735	0.013	16,800	515	0.011	16,800	410	0.008
"	12	1°30	26,250	893	0.008	22,575	714	0.006	14,700	399	0.005	13,650	336	0.004
"	4	2°	43,050	2,142	0.032	31,500	1,418	0.022	23,625	788	0.021	23,625	704	0.016
"	8	2°	26,775	998	0.020	22,050	735	0.015	16,800	515	0.013	16,800	410	0.009
"	12	2°	26,250	893	0.010	22,575	714	0.012	14,700	399	0.008	13,650	336	0.005
R 0.4	4	0°30	43,050	2,310	0.037	29,400	1,470	0.028	24,150	861	0.026	24,150	714	0.016
"	8	0°30	26,775	1,365	0.021	18,900	945	0.016	15,750	630	0.016	15,750	578	0.011
"	12	0°30	26,775	1,050	0.016	16,275	525	0.013	12,600	462	0.011	12,600	420	0.007
"	4	1°	43,050	2,310	0.037	29,400	1,470	0.028	24,150	861	0.026	24,150	714	0.016
"	8	1°	26,775	1,365	0.021	18,900	945	0.016	15,750	630	0.016	15,750	578	0.011
"	12	1°	26,775	1,050	0.016	16,275	525	0.013	12,600	462	0.011	12,600	420	0.007
"	4	1°30	43,050	2,310	0.037	29,400	1,470	0.028	24,150	861	0.026	24,150	714	0.016
"	8	1°30	26,775	1,365	0.021	18,900	945	0.016	15,750	630	0.016	15,750	578	0.011
"	12	1°30	26,775	1,050	0.016	16,275	525	0.013	12,600	462	0.011	12,600	420	0.007
"	4	2°	43,050	2,310	0.037	29,400	1,470	0.028	24,150	861	0.026	24,150	714	0.016
"	8	2°	26,775	1,365	0.021	18,900	945	0.016	15,750	630	0.016	15,750	578	0.011
"	12	2°	26,775	1,050	0.016	16,275	525	0.013	12,600	462	0.011	12,600	420	0.007

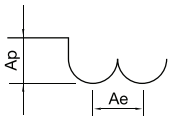
- If there is no same taper angle of your endmill on the table, refer to the previous paper angle of diameter and apply the same proportion.
- Adjust the value of the feed and Ap based on the effective length and taper angle, and adjust the milling condition.
- Use the table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolant is recommended, and wet coolants are recommended for copper milling.
- Where the parameters exceed the machine's maximum spindle speed, the RPM and feedrate should be reduced proportionally.
- Note for chip emission, heat or ignition.

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Hardness			40 ~ 45HRc			45 ~ 55HRc			55 ~ 62HRc			62 ~ 70HRc		
Radius	Effective Length	Taper Angle	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
R 0.5	6	0°30'	26,250	2,100	0.047	17,850	1,365	0.037	17,850	1,050	0.032	16,800	861	0.026
"	10	0°30'	17,850	1,103	0.023	12,600	767	0.019	11,550	683	0.017	11,550	525	0.013
"	20	0°30'	15,750	945	0.014	10,500	683	0.011	9,450	567	0.008	9,450	462	0.008
"	6	1°	26,250	2,100	0.047	17,850	1,365	0.037	17,850	1,050	0.032	16,800	861	0.026
"	10	1°	17,850	1,103	0.023	12,600	767	0.019	11,550	683	0.017	11,550	525	0.013
"	20	1°	15,750	945	0.014	10,500	683	0.011	9,450	567	0.008	9,450	462	0.008
"	30	1°	15,750	750	0.007	10,500	540	0.005	9,450	430	0.004	9,450	360	0.004
"	6	1°30'	26,250	2,100	0.047	17,850	1,365	0.037	17,850	1,050	0.032	16,800	861	0.026
"	10	1°30'	17,850	1,103	0.023	12,600	767	0.019	11,550	683	0.017	11,550	525	0.013
"	20	1°30'	15,750	945	0.014	10,500	683	0.011	9,450	567	0.008	9,450	462	0.008
"	30	1°30'	15,750	750	0.007	10,500	540	0.005	9,450	430	0.004	9,450	360	0.004
"	20	2°	15,750	945	0.014	10,500	683	0.011	9,450	567	0.008	9,450	462	0.008
"	30	2°	15,750	750	0.007	10,500	540	0.005	9,450	430	0.004	9,450	360	0.004
"	20	3°	15,750	945	0.014	10,500	683	0.011	9,450	567	0.008	9,450	462	0.008
"	30	3°	15,750	750	0.007	10,500	540	0.005	9,450	430	0.004	9,450	360	0.004
"	40	3°	12,250	550	0.004	8,550	420	0.002	7,800	365	0.002	7,800	285	0.002
R 0.75	10	0°30'	18,900	2,205	0.063	12,600	1,470	0.042	12,600	1,165	0.037	12,600	893	0.032
"	20	0°30'	13,650	1,260	0.032	9,450	945	0.021	9,450	735	0.016	9,450	630	0.014
"	30	0°30'	9,450	893	0.016	7,350	651	0.013	7,350	546	0.011	7,350	504	0.011
"	10	1°	18,900	2,205	0.063	12,600	1,470	0.042	12,600	1,155	0.037	12,600	893	0.032
"	20	1°	13,650	1,260	0.032	9,450	945	0.021	9,450	735	0.016	9,450	630	0.014
"	30	1°	9,450	893	0.016	7,350	651	0.013	7,350	546	0.011	7,350	504	0.011
"	10	1°30'	18,900	2,205	0.063	12,600	1,470	0.042	12,600	1,155	0.037	12,600	893	0.032
"	20	1°30'	13,650	1,260	0.036	9,450	945	0.024	9,450	735	0.018	9,450	630	0.016
"	30	1°30'	9,450	893	0.017	7,350	651	0.014	7,350	546	0.012	7,350	504	0.011
"	40	1°30'	8,400	675	0.010	6,300	510	0.008	6,300	420	0.007	6,300	400	0.006
"	10	2°	18,900	2,205	0.063	12,600	1,470	0.042	12,600	1,155	0.037	12,600	893	0.032
"	20	2°	13,650	1,260	0.036	9,450	945	0.024	9,450	735	0.018	9,450	630	0.016
"	30	2°	9,450	893	0.017	7,350	651	0.014	7,350	546	0.012	7,350	504	0.011
"	40	2°	8,400	675	0.010	6,300	510	0.008	6,300	420	0.007	6,300	400	0.006
R 1	12	0°30'	15,750	2,468	0.084	11,550	1,785	0.068	11,025	1,428	0.059	11,025	1,124	0.048
"	20	0°30'	10,500	1,470	0.063	8,400	1,050	0.053	9,450	1,050	0.047	9,450	924	0.037
"	30	0°30'	9,450	1,260	0.047	7,350	840	0.037	7,350	819	0.032	7,350	672	0.026
"	40	0°30'	9,450	1,260	0.037	7,035	819	0.032	6,300	735	0.026	6,300	609	0.021
"	12	0°30'	15,750	2,468	0.084	11,550	1,785	0.068	11,025	1,428	0.059	11,025	1,124	0.048
"	20	0°30'	10,500	1,470	0.063	8,400	1,050	0.053	9,450	1,050	0.047	9,450	924	0.037
"	30	1°	9,450	1,260	0.047	7,350	840	0.037	7,350	819	0.032	7,350	672	0.026
"	40	1°	9,450	1,260	0.037	7,035	819	0.032	6,300	735	0.026	6,300	609	0.021
"	50	1°	7,900	990	0.027	6,650	770	0.025	5,600	655	0.022	5,600	525	0.015
"	12	1°30'	15,750	2,468	0.090	11,550	1,785	0.088	11,025	1,428	0.065	11,025	1,124	0.052
"	20	1°30'	10,500	1,470	0.074	8,400	1,050	0.060	9,450	1,050	0.054	9,450	924	0.042
"	30	1°30'	9,450	1,260	0.055	7,350	840	0.043	7,350	819	0.038	7,350	672	0.031
"	40	1°30'	9,450	1,260	0.043	7,035	819	0.037	6,300	735	0.033	6,300	609	0.026
"	50	1°30'	7,900	990	0.030	6,650	770	0.028	5,600	655	0.029	5,600	525	0.021
"	30	2°	9,450	1,260	0.055	7,350	840	0.043	7,350	819	0.038	7,350	672	0.031
"	40	2°	9,450	1,260	0.043	7,035	819	0.037	6,300	735	0.033	6,300	609	0.026
"	50	2°	7,900	990	0.030	6,650	770	0.028	5,600	655	0.029	5,600	525	0.021

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Material			Alloy Steels / Prehardened Steels NAK80/KP4M			Hardened Steels STAVX / SKD11			Heat-treated Steels / Hardened Steels SKD11 / SKD61			Heat-treated Steels / Hardened Steels YXR7 / SKH51		
Hardness			40 ~ 45HRc			45 ~ 55HRc			55 ~ 62HRc			62 ~ 70HRc		
Radius	Effective Length	Taper Angle	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
"	30	3°	9,450	1,260	0.055	7,350	840	0.043	7,350	819	0.038	7,350	672	0.031
"	40	3°	9,450	1,260	0.043	7,035	819	0.037	6,300	735	0.033	6,300	609	0.026
"	50	3°	7,900	990	0.030	6,650	770	0.028	5,600	655	0.029	5,600	525	0.021
R 1.5	20	0°30'	10,500	2,310	0.095	8,400	1,365	0.074	7,350	1,260	0.063	7,350	1,155	0.053
"	30	0°30'	9,450	1,890	0.079	7,350	1,103	0.063	6,300	1,050	0.053	6,300	924	0.044
"	40	0°30'	7,875	1,470	0.063	5,250	924	0.053	5,355	840	0.042	5,355	735	0.037
"	50	0°30'	7,875	1,365	0.042	5,250	840	0.032	5,355	788	0.026	5,355	683	0.024
"	20	1°	10,500	2,310	0.095	8,400	1,365	0.074	7,350	1,260	0.063	7,350	1,155	0.053
"	30	1°	9,450	1,890	0.079	7,350	1,103	0.063	6,300	1,050	0.053	6,300	924	0.044
"	40	1°	7,875	1,470	0.063	5,250	924	0.053	5,155	840	0.042	5,155	735	0.037
"	50	1°	7,875	1,365	0.042	5,250	840	0.032	5,155	788	0.026	5,155	683	0.024
"	60	1°	6,400	1,225	0.028	4,325	710	0.021	4,300	670	0.018	4,300	540	0.016
"	20	1°30'	10,500	2,310	0.095	8,400	1,365	0.074	7,350	1,260	0.063	7,350	1,155	0.053
"	30	1°30'	9,450	1,890	0.079	7,350	1,103	0.063	6,300	1,050	0.053	6,300	924	0.044
"	40	1°30'	7,875	1,470	0.063	5,250	924	0.053	5,355	840	0.042	5,355	735	0.037
"	50	1°30'	7,875	1,365	0.042	5,250	840	0.032	5,355	788	0.026	5,355	683	0.024
"	60	1°30'	6,400	1,225	0.028	4,325	710	0.021	4,300	670	0.018	4,300	540	0.016
"	20	2°	10,500	2,310	0.095	8,400	1,365	0.074	7,350	1,260	0.063	7,350	1,155	0.053
"	30	2°	9,450	1,890	0.079	7,350	1,103	0.063	6,300	1,050	0.053	6,300	924	0.044
"	48	2°	7,875	1,365	0.042	5,250	840	0.032	5,355	788	0.026	5,355	683	0.024
"	60	2°	6,400	1,225	0.028	4,325	710	0.021	4,300	670	0.018	4,300	540	0.016
"	30	3°	9,450	1,890	0.079	7,350	1,103	0.063	6,300	1,050	0.053	6,300	924	0.044
"	50	3°	7,875	1,365	0.042	5,250	840	0.032	5,355	788	0.026	5,355	683	0.024
R 2	40	0°30'	6,300	1,260	0.085	3,675	630	0.068	3,360	557	0.053	3,360	525	0.045
"	60	0°30'	4,200	767	0.063	3,150	473	0.047	2,940	420	0.042	2,940	368	0.033
"	50	1°	5,250	1,010	0.074	3,450	550	0.058	3,120	480	0.048	3,110	445	0.038
"	60	1°	4,200	767	0.063	3,150	473	0.047	2,940	420	0.042	2,940	368	0.033
"	70	1°	3,200	540	0.048	2,760	320	0.036	2,770	360	0.036	2,770	300	0.028
"	45	1°30'	5,250	1,010	0.074	3,450	550	0.058	3,120	480	0.048	3,110	445	0.038
"	60	1°30'	4,200	767	0.063	3,150	473	0.047	2,940	420	0.042	2,940	368	0.033
"	70	1°30'	3,200	540	0.048	2,760	320	0.036	2,770	360	0.036	2,770	300	0.028
"	25	3°	9,450	1,890	0.079	7,350	1,103	0.063	6,300	1,050	0.053	6,300	924	0.044
"	42	3°	7,875	1,365	0.042	5,250	840	0.032	5,355	788	0.026	5,355	683	0.024
R 2.5	40	1°	6,300	1,260	0.085	3,675	630	0.068	3,360	557	0.053	3,360	525	0.045
"	60	1°	4,200	767	0.063	3,150	473	0.047	2,940	420	0.042	2,940	368	0.033
"	90	1°	2,200	480	0.041	2,450	280	0.030	2,470	250	0.028	2,200	237	0.023
"	40	1°30'	6,300	1,260	0.085	3,675	630	0.068	3,360	557	0.053	3,360	525	0.045
"	60	1°30'	4,200	767	0.063	3,150	473	0.047	2,940	420	0.042	2,940	368	0.033
"	90	1°30'	2,200	480	0.041	2,450	280	0.030	2,470	250	0.028	2,200	237	0.023
R 3	40	1°	9,450	2,205	0.147	7,350	1,103	0.105	6,300	998	0.084	6,300	893	0.061
"	50	1°	7,600	1,910	0.122	5,980	980	0.088	5,000	845	0.070	5,300	760	0.055
"	60	1°	6,100	1,670	0.105	5,285	820	0.070	4,180	760	0.062	4,300	620	0.048
"	70	1°	4,725	1,470	0.074	4,095	735	0.063	3,570	683	0.053	3,570	578	0.042
"	80	1°	3,540	1,320	0.061	3,400	640	0.046	2,100	510	0.040	2,100	468	0.033
"	49	1°30'	7,800	1,910	0.122	5,980	980	0.088	5,000	845	0.070	5,300	760	0.055

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Hardness			40 ~ 45HRc			45 ~ 55HRc			55 ~ 62HRc			62 ~ 70HRc		
Radius	Effective Length	Taper Angle	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
"	85	1°30'	3,360	1,220	0.055	3,100	580	0.040	1,880	460	0.035	1,880	448	0.028
"	60	2°	6,100	1,670	0.105	5,285	820	0.070	4,180	760	0.062	4,300	620	0.048
"	90	2°	3,000	1,050	0.055	2,870	520	0.040	1,720	410	0.035	1,720	400	0.028
R 4	50	1°	9,345	2,310	0.189	7,350	1,155	0.147	6,300	1,050	0.105	6,300	840	0.086
"	60	1°	7,150	1,846	0.138	5,330	916	0.114	4,550	820	0.080	4,550	655	0.064
"	80	1°	4,515	1,365	0.095	3,360	683	0.084	3,045	578	0.068	3,045	473	0.042
"	52	1°30'	9,345	2,310	0.197	7,350	1,155	0.154	6,300	1,050	0.113	6,300	840	0.094
"	89	1°30'	3,400	1,090	0.073	2,970	578	0.046	1,890	454	0.041	1,860	443	0.033
R 5	60	1°	5,775	1,785	0.194	3,675	893	0.168	3,570	735	0.126	3,570	630	0.084
"	75	1°	4,200	998	0.093	3,150	504	0.068	2,940	420	0.053	2,940	336	0.034
"	54	1°30'	6,175	1,850	0.220	3,935	923	0.185	3,760	768	0.146	3,760	678	0.097
R 6	85	1°30'	2,940	336	0.063	1,995	168	0.032	1,575	158	0.016	1,575	105	0.011
"	63	3°	3,990	735	0.126	2,940	368	0.086	2,625	326	0.063	2,625	231	0.047

Depth of Cut



Ap : Axial Depth (mm)
 Ae : Radial Depth (mm)
 D : Outside Diameter (mm)
 n : Speed (min⁻¹)
 Vf : Feed (mm/min)

- If there is no same taper angle of your endmill on the table, refer to the previous taper angle of diameter and apply the same proportion.
- Adjust the value of the feed and Ap based on the effective length and taper angle and adjust the milling condition.
- Use the table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolant is recommended and wet coolants are recommended for copper milling.
- Where the parameters exceed the machine's maximum spindle speed, the RPM and feedrate should be reduced proportionally.
- Note for chip emission, heat or ignition.