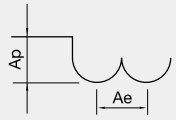
2BCBN/2SBCBN Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
반경 Radius	유효장 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
R 0.1	0.2	50,000	326	0.005	0.005	50,000	216	0.004	0.004	50,000	120	0.003	0.003
〃	0.5	50,000	308	0.004	0.004	50,000	198	0.003	0.003	50,000	110	0.002	0.003
R 0.15	0.3	50,000	800	0.006	0.010	50,000	520	0.004	0.005	50,000	410	0.003	0.005
〃	0.5	50,000	720	0.006	0.010	50,000	450	0.003	0.005	50,000	390	0.003	0.005
〃	1	50,000	650	0.006	0.010	50,000	410	0.003	0.005	50,000	350	0.003	0.004
R 0.2	0.3	50,000	1,120	0.010	0.010	50,000	750	0.005	0.006	50,000	650	0.005	0.005
〃	1	50,000	1,050	0.010	0.010	50,000	710	0.005	0.005	50,000	600	0.005	0.005
〃	3	50,000	540	0.005	0.005	50,000	360	0.003	0.003	50,000	310	0.002	0.003
R 0.25	0.4	50,000	1,420	0.010	0.020	50,000	1,210	0.005	0.010	50,000	1,030	0.005	0.010
〃	1	50,000	1,290	0.010	0.015	50,000	1,100	0.005	0.010	50,000	980	0.005	0.010
〃	3	50,000	1,090	0.010	0.015	50,000	850	0.005	0.010	50,000	730	0.005	0.010
R 0.3	0.5	50,000	2,300	0.020	0.020	50,000	1,890	0.015	0.015	50,000	1,520	0.010	0.010
〃	1	50,000	2,180	0.020	0.020	50,000	1,760	0.010	0.010	50,000	1,490	0.010	0.010
〃	3	40,000	1,300	0.015	0.020	40,000	1,060	0.010	0.010	40,000	870	0.010	0.010
〃	5	30,000	650	0.015	0.015	30,000	590	0.010	0.010	30,000	390	0.005	0.005
R 0.4	0.6	50,000	2,600	0.020	0.030	50,000	1,980	0.020	0.020	50,000	1,720	0.010	0.020
〃	2	40,000	2,100	0.015	0.020	40,000	1,450	0.015	0.015	40,000	1,210	0.010	0.010
〃	4	30,000	1,540	0.015	0.015	30,000	940	0.010	0.015	30,000	840	0.010	0.010
〃	8	24,000	970	0.010	0.010	24,000	650	0.005	0.010	24,000	470	0.005	0.005
R 0.5	1.5	40,000	2,560	0.030	0.040	40,000	1,980	0.020	0.030	40,000	1,590	0.020	0.020
〃	3	30,000	2,100	0.030	0.030	30,000	1,650	0.020	0.030	30,000	1,240	0.020	0.020
〃	5	30,000	1,700	0.030	0.030	30,000	1,360	0.015	0.020	30,000	1,080	0.010	0.015
〃	10	25,000	780	0.015	0.015	25,000	620	0.010	0.015	16,000	500	0.010	0.010
R 0.75	2	40,000	2,300	0.040	0.040	40,000	1,920	0.030	0.030	40,000	1,530	0.020	0.030
〃	4	30,000	2,010	0.030	0.030	30,000	1,600	0.025	0.025	30,000	1,280	0.020	0.020
〃	8	30,000	1,700	0.030	0.030	30,000	1,360	0.020	0.020	30,000	1,080	0.010	0.010
R 1	2	40,000	3,310	0.050	0.050	40,000	2,640	0.040	0.040	40,000	2,110	0.030	0.040
〃	6	40,000	3,020	0.030	0.040	40,000	2,410	0.030	0.030	40,000	1,930	0.020	0.030
〃	10	24,000	1,210	0.020	0.030	24,000	970	0.010	0.030	24,000	770	0.010	0.020
〃	14	16,000	920	0.010	0.020	16,000	780	0.010	0.010	16,000	630	0.010	0.010
R 1.5	3	40,000	2,500	0.030	0.040	40,000	2,000	0.030	0.030	40,000	1,600	0.020	0.030
〃	6	32,000	2,100	0.030	0.030	32,000	1,680	0.020	0.030	32,000	1,340	0.020	0.030
〃	10	21,000	1,700	0.020	0.030	21,000	1,360	0.020	0.020	21,000	1,080	0.010	0.020
〃	16	16,000	1,100	0.020	0.030	16,000	880	0.010	0.020	16,000	700	0.010	0.010
R 2	4	40,000	2,100	0.030	0.040	40,000	1,680	0.030	0.030	40,000	1,340	0.020	0.030
〃	10	21,000	1,620	0.020	0.030	21,000	1,290	0.020	0.020	21,000	1,030	0.010	0.020
〃	16	16,000	1,060	0.010	0.020	16,000	840	0.010	0.020	16,000	670	0.010	0.010
R 3		16,000~ 50,000	960~ 3,000	0.050	0.060	13,000~ 50,000	780~ 2,000	0.050	0.060	11,000~ 50,000	540~ 1,500	0.050	0.060

절입량 Depth of Cut



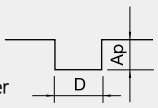
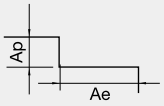
Ap : Axial Depth 축 방향의 절입 깊이(mm)
Ae : Radial Depth 반경 방향의 절입 깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전 속도 (min^{-1})
Vf : Feed 이송 속도 (mm/min)

- HRC68 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실제 가공시에는 가공 형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
- 절삭조건이 없는 유효장은 비슷한 유효장에 비례하여 사용 하십시오.
- 길이가 긴 엔드밀의 경우 떨림, 이상음이 발생할 경우에는 상기표의 회전속도와 이송속도를 같은 비율로 내려서 사용해 주십시오.

- In case machining Hardened steel HRC upper 68, reduce 20% of cutting parameter on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If there is no effective length of your endmill on the table, use a similar type of effective length and apply the same proportion.
- In case of long length endmill shaking or abnormal sound, lower the rotation speed and feed speed of the table above by the same ratio.

2ECBN Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	유효장 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 0.2	0.2	50,000	211	0.005	0.005	50,000	140	0.004	0.004	50,000	78	0.003	0.003
〃	0.5	50,000	200	0.004	0.004	50,000	130	0.003	0.003	50,000	71	0.002	0.003
ø 0.3	0.3	50,000	520	0.006	0.010	50,000	290	0.004	0.005	50,000	260	0.003	0.005
〃	0.5	50,000	460	0.006	0.010	50,000	270	0.003	0.005	50,000	250	0.003	0.005
〃	1	50,000	422	0.006	0.010	50,000	260	0.003	0.005	50,000	220	0.003	0.004
ø 0.4	0.3	50,000	840	0.010	0.010	50,000	490	0.005	0.006	50,000	430	0.005	0.005
〃	1	50,000	690	0.010	0.010	50,000	470	0.005	0.005	50,000	420	0.005	0.005
〃	2	50,000	370	0.005	0.005	50,000	240	0.003	0.003	50,000	209	0.002	0.003
ø 0.5	0.4	50,000	940	0.010	0.020	50,000	810	0.005	0.010	50,000	732	0.005	0.010
〃	1	50,000	850	0.010	0.015	50,000	560	0.005	0.010	50,000	523	0.005	0.010
〃	3	50,000	560	0.010	0.015	50,000	530	0.005	0.010	50,000	504	0.005	0.010
ø 0.8	0.6	50,000	1,530	0.020	0.020	50,000	1,254	0.015	0.015	50,000	1,083	0.010	0.010
〃	2	50,000	1,440	0.020	0.020	50,000	1,169	0.010	0.010	50,000	1,064	0.010	0.010
〃	4	40,000	860	0.015	0.020	40,000	703	0.010	0.010	40,000	620	0.010	0.010
〃	6	30,000	440	0.015	0.015	30,000	390	0.010	0.010	30,000	280	0.005	0.005
ø 1	0.7	50,000	1,730	0.020	0.030	50,000	1,311	0.020	0.020	50,000	1,230	0.010	0.020
〃	2	40,000	1,390	0.015	0.020	40,000	960	0.015	0.015	40,000	870	0.010	0.010
〃	4	30,000	1,030	0.015	0.015	30,000	620	0.010	0.015	30,000	600	0.010	0.010
〃	8	24,000	650	0.010	0.010	24,000	440	0.005	0.010	24,000	340	0.005	0.005
ø 1.5	0.8	40,000	1,700	0.030	0.040	40,000	1,090	0.020	0.030	40,000	1,130	0.020	0.020
〃	2	30,000	1,400	0.030	0.030	30,000	1,100	0.020	0.030	30,000	880	0.020	0.020
〃	4	30,000	1,130	0.030	0.030	30,000	900	0.015	0.020	30,000	770	0.010	0.015
〃	8	16,000	520	0.015	0.015	16,000	410	0.010	0.015	16,000	350	0.010	0.010
ø 2	2	40,000	1,530	0.040	0.040	40,000	1,270	0.030	0.030	40,000	1,090	0.020	0.030
〃	4	30,000	1,330	0.030	0.030	30,000	1,060	0.025	0.025	30,000	910	0.020	0.020
〃	8	26,000	1,130	0.030	0.030	26,000	900	0.020	0.025	26,000	770	0.010	0.010
ø 2.5	1.2	40,000	2,200	0.050	0.050	40,000	1,760	0.040	0.040	40,000	1,500	0.030	0.040
〃	4	40,000	1,540	0.030	0.040	40,000	1,240	0.030	0.030	40,000	1,150	0.020	0.030
〃	10	24,000	810	0.020	0.030	24,000	650	0.010	0.030	24,000	260	0.010	0.020
ø 3	6	40,000	1,400	0.030	0.030	40,000	1,120	0.020	0.030	40,000	960	0.020	0.030
〃	10	21,000	1,130	0.020	0.030	21,000	900	0.020	0.020	21,000	770	0.010	0.020
〃	16	16,000	730	0.020	0.030	16,000	590	0.010	0.020	16,000	500	0.010	0.010
ø 4	6	40,000	1,430	0.030	0.040	40,000	1,120	0.030	0.030	40,000	1,040	0.020	0.030
〃	10	21,000	1,080	0.020	0.030	21,000	850	0.020	0.020	21,000	740	0.010	0.020
〃	16	16,000	700	0.010	0.020	21,000	560	0.010	0.020	16,000	470	0.010	0.010
ø 6		16,000~ 50,000	740~ 3,000	0.050	0.060	13,000~ 50,000	590~ 2,000	0.050	0.060	11,000~ 50,000	390~ 1,500	0.050	0.060
절입량 Depth of Cut		Slotting • Ap : Axial Depth • D : Outside Diameter				Side Milling • Ap : Axial Depth • Ae : Radial Depth							

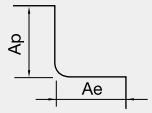
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC68 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실제 가공시에는 가공 형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
- 절삭조건이 없는 유효장은 비슷한 유효장에 비례하여 사용 하십시오.
- 길이가 긴 엔드밀의 경우 떨림, 이상음이 발생할 경우에는 상기표의 회전속도와 이송속도를 같은 비율로 내려서 사용해 주십시오.

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- In case machining Hardened steel HRC upper 68, reduce 20% of cutting parameter on the table.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If there is no effective length of your endmill on the table, use a similar type of effective length and apply the same proportion.
- In case of long length endmill shaking or abnormal sound, lower the rotation speed and feed speed of the table above by the same ratio.

2CCBN/2SCCBN/4SCCBN Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	유효장 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 0.4	0.3	50,000	890	0.010	0.010	50,000	520	0.005	0.006	50,000	450	0.005	0.005
〃	1	50,000	730	0.010	0.010	50,000	500	0.005	0.005	50,000	430	0.005	0.005
〃	2	50,000	390	0.005	0.005	50,000	250	0.003	0.003	50,000	220	0.002	0.003
ø 0.5	0.4	50,000	990	0.010	0.020	50,000	850	0.005	0.010	50,000	770	0.005	0.010
〃	1	50,000	900	0.010	0.015	50,000	590	0.005	0.010	50,000	550	0.005	0.010
〃	3	50,000	630	0.010	0.015	50,000	560	0.005	0.010	50,000	530	0.005	0.010
ø 0.8	0.6	50,000	1,610	0.020	0.020	50,000	1,320	0.015	0.015	50,000	1,140	0.010	0.010
〃	2	50,000	1,520	0.020	0.020	50,000	1,230	0.010	0.010	50,000	1,120	0.010	0.010
〃	4	40,000	910	0.015	0.020	40,000	740	0.010	0.010	40,000	650	0.010	0.010
〃	6	30,000	460	0.015	0.015	30,000	410	0.010	0.010	30,000	290	0.005	0.005
ø 1	0.7	50,000	1,820	0.020	0.030	50,000	1,380	0.020	0.020	50,000	1,290	0.010	0.020
〃	2	40,000	1,470	0.015	0.020	40,000	1,010	0.015	0.015	40,000	910	0.010	0.010
〃	4	30,000	1,080	0.015	0.015	30,000	660	0.010	0.015	30,000	630	0.010	0.010
〃	8	24,000	680	0.010	0.010	24,000	460	0.005	0.010	24,000	360	0.005	0.005
ø 1.5	0.8	40,000	1,790	0.030	0.040	40,000	1,150	0.020	0.030	40,000	1,190	0.020	0.020
〃	2	30,000	1,470	0.030	0.030	30,000	1,160	0.020	0.030	30,000	930	0.020	0.020
〃	4	30,000	1,190	0.030	0.030	30,000	950	0.015	0.020	30,000	810	0.010	0.015
〃	8	24,000	550	0.015	0.015	24,000	430	0.010	0.015	24,000	370	0.010	0.010
ø 2	2	40,000	1,610	0.040	0.040	40,000	1,340	0.030	0.030	40,000	1,150	0.020	0.030
〃	4	30,000	1,400	0.030	0.030	30,000	1,120	0.025	0.025	30,000	960	0.020	0.020
〃	8	30,000	1,190	0.030	0.030	30,000	950	0.020	0.030	30,000	810	0.010	0.010
ø 2.5	1.2	40,000	2,317	0.050	0.050	40,000	1,850	0.040	0.040	40,000	1,580	0.030	0.040
〃	4	40,000	1,620	0.030	0.040	40,000	1,300	0.030	0.030	40,000	1,210	0.020	0.030
〃	10	24,000	850	0.020	0.030	24,000	680	0.010	0.030	24,000	280	0.010	0.020
ø 3	6	40,000	1,470	0.030	0.030	40,000	1,180	0.020	0.030	40,000	1,010	0.020	0.030
〃	10	21,000	1,190	0.020	0.030	21,000	950	0.020	0.020	21,000	810	0.010	0.020
〃	16	16,000	770	0.020	0.030	16,000	620	0.010	0.020	16,000	530	0.010	0.010
ø 4	6	40,000	1,510	0.030	0.040	40,000	1,180	0.030	0.030	40,000	1,100	0.020	0.030
〃	10	21,000	1,140	0.020	0.030	21,000	900	0.020	0.020	21,000	780	0.010	0.020
〃	16	16,000	740	0.010	0.020	16,000	590	0.010	0.020	16,000	500	0.010	0.010
ø 6		16,000~ 50,000	740~ 3,000	0.050	0.060	13,000~ 50,000	590~ 2,000	0.050	0.060	11,000~ 50,000	390~ 1,500	0.050	0.060
절입량 Depth of Cut		• Ap : Axial Depth • Ae : Radial Depth											



- HRC68 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 4날 사용시 Feed 20% 증가, 절입량을 5% 감소하여 사용 하십시오.
- 측면 절삭시 코너R 부분과 각도 내용을 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시에는가공형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
- 절삭조건이 없는 유효장은 비슷한 유효장에 비례하여 사용 하십시오.
- 길이가 긴 엔드밀의 경우 떨림, 이상음이 발생할 경우에는 상기표의 회전속도와 이송속도를 같은 비율로 내려서 사용해 주십시오.

- In case machining Hardened steel HRC upper 68, reduce 20% of cutting parameter on the table.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- For using 4 flutes, reduce the feed by 20% and the depth of cut by 5%.
- For side milling, refer to the corner R section and the angle.
- For curved milling, set up a pitch below than corner radius of the tool diameter.
- For curved milling, raise the feed upto 30% at a stable speed.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If there is no effective length of your endmill on the table, use a similar type of effective length and apply the same proportion.
- In case of long length endmill shaking or abnormal sound, lower the rotation speed and feed speed of the table above by the same ratio.

2JJRB Cutting Condition

• RPM : rev./min • Feed : mm/min

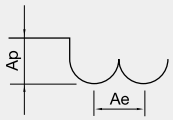
피삭재 Material		고경도강 Hardened Steels STAVX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		45 ~ 55HRc				55 ~ 62HRc				62 ~ 70HRc			
반경 Radius	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.1	0.5	60,000	176	0.002	0.005	66,000	104	0.002	0.005	49,500	52	0.002	0.005
〃	1	60,000	176	0.002	0.005	66,000	104	0.002	0.005	49,500	52	0.002	0.005
〃	1.5	48,000	70	0.001	0.003	52,000	52	0.001	0.003	39,600	24	0.001	0.003
〃	2	48,000	44	0.001	0.003	52,000	32	0.001	0.003	39,600	16	0.001	0.003
R 0.15	1	45,000	273	0.004	0.010	47,850	144	0.003	0.008	35,750	72	0.003	0.008
〃	1.5	45,000	273	0.004	0.010	47,850	144	0.003	0.008	35,750	72	0.003	0.008
〃	2	45,000	167	0.003	0.008	47,850	88	0.002	0.005	35,750	44	0.002	0.005
〃	3	32,000	70	0.002	0.005	35,200	52	0.001	0.003	26,400	24	0.001	0.003
R 0.2	1	37,500	370	0.007	0.018	38,500	192	0.005	0.013	28,875	96	0.005	0.013
〃	2	37,500	370	0.007	0.018	38,500	192	0.005	0.013	28,875	96	0.005	0.013
〃	3	31,900	185	0.004	0.010	33,550	128	0.003	0.008	25,080	64	0.002	0.005
〃	4	25,500	132	0.002	0.005	26,730	96	0.002	0.005	20,020	48	0.002	0.005
R 0.25	1	33,000	466	0.010	0.025	33,000	240	0.007	0.018	24,750	120	0.007	0.018
〃	2	33,000	466	0.010	0.025	33,000	240	0.007	0.018	24,750	120	0.007	0.018
〃	3	31,000	352	0.007	0.018	31,405	184	0.005	0.013	23,540	60	0.005	0.013
〃	4	27,150	132	0.003	0.008	28,215	80	0.002	0.005	21,890	40	0.002	0.005
〃	5	24,200	97	0.002	0.005	25,850	60	0.002	0.005	19,360	28	0.002	0.005
〃	6	21,300	66	0.001	0.003	23,430	40	0.001	0.003	17,600	20	0.001	0.003
〃	8	15,900	35	0.001	0.003	17,490	20	0.001	0.003	13,145	10	0.001	0.003
R 0.3	1	30,000	1,320	0.030	0.075	29,150	800	0.015	0.038	22,000	400	0.015	0.038
〃	2	30,000	1,056	0.020	0.050	29,150	640	0.010	0.025	22,000	320	0.010	0.025
〃	3	30,000	704	0.015	0.038	29,150	416	0.008	0.020	22,000	208	0.008	0.020
〃	4	30,000	440	0.010	0.025	29,150	272	0.006	0.015	22,000	136	0.006	0.015
〃	5	25,000	343	0.007	0.018	25,300	208	0.005	0.013	19,800	104	0.005	0.013
〃	6	21,000	282	0.005	0.013	21,450	168	0.004	0.010	16,500	84	0.004	0.010
〃	8	16,000	211	0.003	0.008	17,600	128	0.003	0.008	13,200	64	0.003	0.008
〃	10	14,900	154	0.002	0.005	16,390	92	0.002	0.005	12,210	44	0.002	0.005
〃	12	13,800	97	0.001	0.003	15,180	56	0.001	0.003	11,385	28	0.001	0.003
R 0.4	2	27,000	1,408	0.040	0.100	25,850	800	0.020	0.050	19,250	400	0.020	0.050
〃	4	27,000	1,056	0.025	0.063	25,850	480	0.012	0.030	19,250	240	0.012	0.030
〃	6	23,000	528	0.012	0.030	22,550	320	0.006	0.015	17,050	160	0.006	0.015
〃	8	18,000	330	0.007	0.018	18,700	228	0.005	0.013	14,025	112	0.005	0.013
〃	10	14,700	299	0.005	0.013	16,115	180	0.004	0.010	12,100	88	0.004	0.010
R 0.5	2	24,000	1,760	0.100	0.250	23,100	1,400	0.050	0.125	17,600	700	0.050	0.125
〃	3	24,000	1,760	0.050	0.125	23,100	1,400	0.030	0.075	17,600	700	0.030	0.075
〃	4	24,000	1,760	0.050	0.125	23,100	1,400	0.030	0.075	17,600	700	0.030	0.075
〃	5	24,000	1,760	0.050	0.125	23,100	1,400	0.030	0.075	17,600	700	0.030	0.075
〃	6	21,500	1,100	0.030	0.075	21,670	840	0.025	0.063	15,950	420	0.025	0.063
〃	8	18,500	510	0.015	0.038	20,240	384	0.015	0.038	15,180	192	0.015	0.038
〃	10	14,800	378	0.010	0.025	16,170	288	0.010	0.025	12,210	144	0.010	0.025
〃	12	13,400	334	0.008	0.020	14,630	232	0.008	0.020	10,945	112	0.008	0.020
〃	14	12,000	308	0.007	0.018	13,200	176	0.007	0.018	9,900	88	0.007	0.018
〃	16	10,500	220	0.005	0.013	11,550	128	0.005	0.013	8,635	64	0.005	0.013
〃	18	9,750	176	0.004	0.010	10,725	104	0.004	0.010	8,030	68	0.004	0.010
〃	20	9,000	132	0.003	0.008	9,900	80	0.003	0.008	7,425	40	0.003	0.008
〃	22	9,000	97	0.002	0.005	9,900	60	0.002	0.005	7,425	28	0.002	0.005
R 0.6	6	20,000	1,760	0.060	0.150	19,250	1,400	0.036	0.090	14,410	700	0.036	0.090
〃	8	16,600	792	0.025	0.063	17,435	600	0.025	0.063	13,090	300	0.025	0.063
〃	10	15,500	510	0.015	0.038	16,885	384	0.015	0.038	12,650	192	0.015	0.038
R 0.7	8	15,350	1,100	0.040	0.100	15,455	840	0.030	0.075	11,605	420	0.030	0.075
R 0.75	3	17,000	1,760	0.120	0.300	16,500	1,400	0.060	0.150	12,375	700	0.060	0.150
〃	4	17,000	1,760	0.120	0.300	16,500	1,400	0.060	0.150	12,375	700	0.060	0.150
〃	6	17,000	1,760	0.070	0.175	16,500	1,400	0.040	0.100	12,375	700	0.040	0.100
〃	8	15,000	1,100	0.045	0.113	15,400	840	0.030	0.075	11,550	420	0.030	0.075
〃	10	15,000	1,100	0.045	0.113	15,400	840	0.030	0.075	11,550	420	0.030	0.075
〃	12	13,000	510	0.020	0.050	14,300	384	0.020	0.050	10,725	192	0.020	0.050
〃	14	10,900	427	0.015	0.038	11,990	308	0.015	0.038	9,020	152	0.015	0.038
〃	16	8,850	343	0.012	0.030	9,680	232	0.012	0.030	7,260	116	0.012	0.030
〃	20	8,000	308	0.010	0.025	8,800	176	0.010	0.025	6,600	88	0.010	0.025
R 0.8	8	17,500	1,848	0.080	0.200	16,830	1,440	0.050	0.125	12,650	720	0.050	0.125
〃	12	13,500	528	0.024	0.060	14,740	392	0.024	0.060	11,055	196	0.025	0.063
〃	16	10,800	396	0.016	0.040	11,770	296	0.016	0.040	8,800	148	0.016	0.040
R 1	4	14,000	1,848	0.150	0.375	13,475	1,440	0.080	0.200	10,120	720	0.080	0.200
〃	6	14,000	1,848	0.100	0.250	13,475	1,440	0.060	0.150	10,120	720	0.060	0.150
〃	8	14,000	1,848	0.100	0.250	13,475	1,440	0.060	0.150	10,120	720	0.060	0.150
〃	10	14,000	1,848	0.100	0.250	13,475	1,440	0.060	0.150	10,120	720	0.600	1.500
〃	12	12,400	1,188	0.060	0.150	12,650	880	0.045	0.113	9,515	440	0.045	0.113
〃	14	12,400	1,188	0.060	0.150	12,650	880	0.045	0.113	9,515	440	0.045	0.113

2JJRB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		고경도강 Hardened Steels STAVX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		45 ~ 55HRc				55 ~ 62HRc				62 ~ 70HRc			
반경 Radius	유효장 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
〃	16	10,800	528	0.030	0.075	11,770	392	0.030	0.075	8,800	196	0.030	0.075
〃	18	9,700	458	0.025	0.063	10,615	344	0.025	0.063	7,975	172	0.025	0.063
〃	20	8,650	396	0.020	0.050	9,416	296	0.020	0.050	7,040	148	0.020	0.050
〃	22	8,200	387	0.018	0.045	9,020	264	0.018	0.045	6,765	132	0.018	0.045
〃	25	7,800	387	0.016	0.040	8,580	232	0.016	0.040	6,435	116	0.016	0.040
〃	30	7,000	308	0.014	0.035	7,700	176	0.014	0.035	5,775	88	0.014	0.035
R 1.25	20	9,600	554	0.040	0.100	10,560	408	0.040	0.100	7,920	204	0.040	0.100
R 1.5	6	10,500	1,936	0.200	0.500	10,120	1,520	0.120	0.300	7,590	760	0.120	0.300
〃	8	10,500	1,936	0.200	0.500	10,120	1,520	0.120	0.300	7,590	760	0.120	0.300
〃	10	10,500	1,936	0.150	0.375	10,120	1,520	0.100	0.250	7,590	760	0.100	0.250
〃	12	10,500	1,936	0.150	0.375	10,120	1,520	0.100	0.250	7,590	760	0.100	0.250
〃	16	10,500	1,936	0.150	0.375	10,120	1,520	0.100	0.250	7,590	760	0.100	0.250
〃	20	9,250	1,232	0.100	0.250	9,460	920	0.075	0.188	7,095	460	0.075	0.188
〃	25	8,000	554	0.050	0.125	8,800	408	0.050	0.125	6,600	204	0.050	0.125
〃	30	5,750	396	0.030	0.075	6,270	296	0.030	0.075	4,703	148	0.030	0.075
〃	35	5,350	387	0.025	0.063	5,885	248	0.025	0.063	4,400	124	0.025	0.063
〃	40	4,900	343	0.020	0.050	5,445	200	0.020	0.050	4,070	100	0.020	0.050
R 2	8	9,000	2,024	0.250	0.625	8,690	1,600	0.150	0.375	6,490	800	0.150	0.375
〃	10	9,000	2,024	0.250	0.625	8,690	1,600	0.150	0.375	6,490	800	0.150	0.375
〃	12	9,000	2,024	0.200	0.500	8,690	1,600	0.130	0.325	6,490	800	0.130	0.325
〃	16	9,000	2,024	0.200	0.500	8,690	1,600	0.130	0.325	6,490	800	0.130	0.325
〃	20	9,000	2,024	0.200	0.500	8,690	1,600	0.130	0.325	6,490	800	0.130	0.325
〃	25	8.000	1,276	0.130	0.325	8,195	1,000	0.090	0.225	6,160	500	0.090	0.225
〃	30	7,000	581	0.060	0.150	7,700	432	0.060	0.150	5,775	216	0.060	0.150
〃	35	6,000	554	0.055	0.138	6,600	408	0.055	0.138	4,950	204	0.055	0.138
〃	40	4,300	396	0.040	0.100	4,730	296	0.040	0.100	3,520	148	0.040	0.100
R 2.5	20	7,200	2,024	0.250	0.625	6,985	1,600	0.160	0.400	5,225	800	0.160	0.400
〃	30	6,400	1,276	0.160	0.400	6,820	1,000	0.110	0.275	5,115	500	0.110	0.275
〃	40	6,000	607	0.080	0.200	6,600	456	0.080	0.200	4,950	228	0.080	0.200
R 3	15	6,500	2,200	0.300	0.750	6,270	1,760	0.200	0.500	4,730	880	0.200	0.500
R 4	25	5,200	1,936	0.400	1.000	4,950	1,520	0.250	0.625	3,740	760	0.250	0.625
R 5	30	4,300	1,760	0.500	1.250	4,125	1,400	0.300	0.750	3,080	700	0.300	0.750
R 6	30	3,600	1,540	0.600	1.500	3,465	1,200	0.350	0.875	2,585	600	0.350	0.875

절입량 Depth of Cut



Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기절삭조건의 20% UP 해주십시오.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동 가공시 습식 쿨런트 추천 합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 진동이 적고 강성이 좋은 공작 기계 사용 요망 합니다(Ø1 이하 사용 시 진동 허용 관리 5㎛ 이내일 것.)
- 칩 제거 주의 및 가 공시 발열, 발화에 주의하십시오.

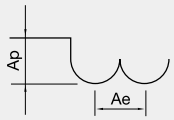
- When milling workpiece HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- Air blow or mist coolant is recommended, and wet coolants are recommended for copper milling.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management will be within 5㎛).
- Note for chip emission, heat, or ignition.

3JJRB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		고경도강 Hardened Steels STAVX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		45 ~ 55HRc				55 ~ 62HRc				62 ~ 70HRc			
반경 Radius	유효장 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
R 0.5	4	25,500	2,360	0.050	0.200	21,000	2,000	0.030	0.170	16,000	960	0.030	0.170
〃	8	18,500	760	0.015	0.120	18,400	710	0.015	0.120	13,800	287	0.015	0.120
〃	12	13,400	540	0.008	0.080	13,300	405	0.008	0.080	9,950	189	0.008	0.080
〃	16	10,500	320	0.005	0.045	10,500	225	0.005	0.045	7,850	115	0.005	0.045
R 0.75	8	15,000	1,389	0.045	0.250	14,000	1,280	0.030	0.210	10,500	648	0.030	0.210
〃	16	8,850	530	0.012	0.130	8,800	489	0.012	0.130	6,600	208	0.012	0.130
R 1	8	14,000	2,350	0.100	0.400	12,250	1,960	0.060	0.300	9,200	1,060	0.060	0.300
〃	16	10,800	776	0.030	0.240	10,700	580	0.030	0.240	8,000	335	0.030	0.240
〃	25	7,800	530	0.016	0.160	7,800	380	0.016	0.160	5,850	320	0.016	0.160
R 1.5	16	10,500	2,500	0.150	0.650	9,200	2,100	0.100	0.500	6,900	1,100	0.100	0.500
〃	25	8,000	820	0.050	0.380	8,000	640	0.050	0.380	6,000	355	0.050	0.380
〃	40	4,900	530	0.020	0.240	4,950	360	0.020	0.240	3,700	220	0.020	0.240
R 2	20	9,000	2,680	0.200	0.850	7,900	2,250	0.130	0.700	5,900	1,240	0.130	0.700
〃	30	7,000	845	0.060	0.450	7,000	710	0.060	0.450	5,250	374	0.060	0.450
〃	40	4,300	640	0.040	0.390	4,300	420	0.040	0.390	3,200	267	0.040	0.390
R 2.5	30	6,400	1,630	0.160	0.880	6,200	1,430	0.110	0.730	4,650	775	0.110	0.730
〃	40	6,000	820	0.080	0.625	5,900	760	0.080	0.625	4,500	415	0.080	0.625
〃	50	5,300	530	0.050	0.410	5,200	490	0.040	0.400	4,300	295	0.035	0.370
R 3	20	6,500	2,820	0.300	1.300	5,700	2,390	0.200	1.000	4,300	1,360	0.200	1.000
〃	30	6,400	1,720	0.160	0.880	6,200	1,538	0.110	0.730	4,650	843	0.110	0.730
R 4	25	5,200	2,350	0.400	1.700	4,500	2,100	0.250	1.350	3,400	1,060	0.250	1.350
〃	40	3,600	1,570	0.300	0.850	2,700	1,260	0.150	0.720	2,040	636	0.120	0.700
R 5	30	4,300	2,170	0.500	2.100	3,750	1,860	0.300	1.700	2,800	986	0.300	1.700
〃	50	3,400	1,330	0.400	1.050	2,419	1,200	0.200	0.750	1,806	636	0.190	0.680
R 6	35	3,600	1,890	0.600	2.600	3,150	1,680	0.350	2.000	2,350	840	0.350	2.000
〃	60	2,700	1,180	0.500	1.300	1,956	1,043	0.250	0.900	1,459	522	0.220	0.850

절입량 Depth of Cut



Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동 가공시 습식 쿨런트 추천 합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 진동이 적고 강성이 좋은 공작 기계 사용 요망 합니다(Ø1 이하 사용 시 진동 허용 관리 5㎛ 이내일 것.)
- 칩 제거 주의 및 가 공시 발열, 발화에 주의하십시오.

- When milling workpiece HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- Air blow or mist coolant is recommended, and wet coolants are recommended for copper milling.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management will be within 5㎛).
- Note for chip emission, heat, or ignition.

2JJTB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material			합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M			고경도강 Hardened Steels STAVAX / SKD11			열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51		
경도 Hardness			40 ~ 45HRc			45 ~ 55HRc			55 ~ 62HRc			62 ~ 70HRc		
반경 Radius	유효장 Effective Length	각도 Taper Angle	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
R 0.1	1.5	0° 30	42,000	630	0.007	28,350	431	0.005	27,300	326	0.005	27,300	252	0.004
〃	2	0° 30	32,550	368	0.005	22,575	252	0.004	21,000	200	0.003	21,000	179	0.003
〃	1.5	1°	42,000	630	0.007	28,350	431	0.005	27,300	326	0.005	27,300	252	0.004
〃	2	1°	32,550	368	0.005	22,575	252	0.004	21,000	200	0.003	21,000	179	0.003
〃	2.5	1°	28,000	230	0.002	19,500	180	0.001	17,000	155	0.001	17,000	155	0.001
〃	1.5	1° 30	42,000	630	0.007	28,350	431	0.005	27,300	326	0.005	27,300	252	0.004
〃	2	1° 30	32,550	368	0.005	22,575	252	0.004	21,000	200	0.003	21,000	179	0.003
〃	2.5	1° 30	28,000	230	0.003	19,500	180	0.001	17,000	155	0.001	17,000	155	0.001
〃	1.5	2°	42,000	630	0.007	28,350	431	0.005	27,300	326	0.005	27,300	252	0.004
〃	2	2°	32,550	368	0.005	22,575	252	0.004	21,000	200	0.003	21,000	179	0.003
〃	2.5	2°	28,000	230	0.004	19,500	180	0.002	17,000	155	0.001	17,000	155	0.001
〃	1.5	3°	42,000	630	0.007	28,350	431	0.005	27,300	326	0.005	27,300	252	0.004
〃	2	3°	32,550	368	0.005	22,575	252	0.004	21,000	200	0.003	21,000	179	0.003
〃	2.5	3°	28,000	230	0.004	19,500	180	0.002	17,000	155	0.001	17,000	155	0.001
R 0.15	3	0° 30	34,650	641	0.008	23,310	399	0.006	21,525	336	0.005	21,525	294	0.004
〃	2	1°	34,650	641	0.008	23,310	399	0.006	21,525	336	0.005	21,525	294	0.004
〃	3	1°	34,650	641	0.008	23,310	399	0.006	21,525	336	0.005	21,525	294	0.004
〃	4	1°	32,550	494	0.005	22,050	326	0.004	19,950	242	0.003	19,950	189	0.001
〃	5	1°	32,550	494	0.003	22,050	326	0.002	19,950	242	0.002	19,950	189	0.001
〃	2	1° 30	34,650	641	0.008	23,310	399	0.006	21,525	336	0.005	21,525	294	0.004
〃	3	1° 30	34,650	641	0.008	23,310	399	0.006	21,525	336	0.005	21,525	294	0.004
〃	4	1° 30	32,550	494	0.003	22,050	326	0.002	19,950	242	0.002	19,950	189	0.002
〃	5	1° 30	32,550	494	0.003	22,050	326	0.002	19,950	242	0.002	19,950	189	0.002
〃	2	2°	34,650	641	0.008	23,310	399	0.006	21,525	336	0.005	21,525	294	0.004
〃	3	2°	34,650	641	0.008	23,310	399	0.006	21,525	336	0.005	21,525	294	0.004
〃	4	2°	32,550	494	0.003	22,050	326	0.002	19,950	242	0.002	19,950	189	0.002
〃	5	2°	32,550	494	0.003	22,050	326	0.002	19,950	242	0.002	19,950	189	0.002
〃	2	3°	34,650	641	0.008	23,310	399	0.006	21,525	336	0.005	21,525	294	0.004
〃	3	3°	34,650	641	0.008	23,310	399	0.006	21,525	336	0.005	21,525	294	0.004
〃	4	3°	32,550	494	0.004	22,050	326	0.003	19,950	242	0.002	19,950	189	0.003
〃	5	3°	32,550	494	0.004	22,050	326	0.003	19,950	242	0.002	19,950	189	0.003
R 0.2	2	0° 30	32,000	1,155	0.016	28,350	788	0.013	26,250	672	0.011	26,250	473	0.008
〃	3	0° 30	30,000	950	0.016	26,300	650	0.013	23,800	580	0.011	23,800	395	0.008
〃	4	0° 30	28,000	780	0.010	21,000	500	0.008	19,000	475	0.007	19,000	325	0.005
〃	5	0° 30	25,200	525	0.004	17,850	326	0.003	16,800	294	0.003	16,800	252	0.002
〃	6	0° 30	25,200	525	0.004	17,850	326	0.003	16,800	294	0.003	16,800	252	0.002
〃	2	1°	32,000	1,155	0.016	28,350	788	0.013	26,250	672	0.011	26,250	473	0.008
〃	3	1°	30,000	950	0.016	26,300	650	0.013	23,800	580	0.011	23,800	395	0.008
〃	4	1°	28,000	780	0.010	21,000	500	0.008	19,000	475	0.007	19,000	325	0.005
〃	5	1°	25,200	525	0.004	17,850	326	0.003	16,800	294	0.003	16,800	252	0.002
〃	6	1°	25,200	525	0.004	17,850	326	0.003	16,800	294	0.003	16,800	252	0.002
〃	2	2°	32,000	1,155	0.016	28,350	788	0.013	26,250	672	0.011	26,250	473	0.008
〃	3	2°	30,000	950	0.016	26,300	650	0.013	23,800	580	0.011	23,800	395	0.008
〃	4	2°	28,000	780	0.010	21,000	500	0.008	19,000	475	0.007	19,000	325	0.005
〃	5	2°	25,200	525	0.004	17,850	326	0.003	16,800	294	0.003	16,800	252	0.002
〃	6	2°	25,200	525	0.004	17,850	326	0.003	16,800	294	0.003	16,800	252	0.002
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

2JJTB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material			합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M			고경도강 Hardened Steels STAVAX / SKD11			열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51		
경도 Hardness			40 ~ 45HRc			45 ~ 55HRc			55 ~ 62HRc			62 ~ 70HRc		
반경 Radius	유효장 Effective Length	각도 Taper Angle	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
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	0.020	22,050	735	0.015	16,800	515	0.015	16,800	410	0.010
〃	12	1° 30	26,250	893	0.010	22,575	714	0.012	14,700	399	0.010	13,650	336	0.007
〃	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	0.022	22,050	735	0.017	16,800	515	0.016	16,800	410	0.010
〃	12	2°	26,250	893	0.012	22,575	714	0.014	14,700	399	0.012	13,650	336	0.007
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

2JJTB/3JJTBS Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material			합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KPM4M			고경도강 Hardened Steels STAVAX / SKD11			열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51		
경도 Hardness			40 ~ 45HRc			45 ~ 55HRc			55 ~ 62HRc			62 ~ 70HRc		
반경 Radius	유효장 Effective Length	각도 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	1,155	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	1°	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	1°	10,500	1,470	0.063	8,400	1,050	0.053	9,450	1,050	0.047	9,450	924	0.037

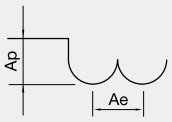
2JJTB/3JJTBS Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material			합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M			고경도강 Hardened Steels STAVAX / SKD11			열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51		
경도 Hardness			40 ~ 45HRc			45 ~ 55HRc			55 ~ 62HRc			62 ~ 70HRc		
반경 Radius	유효장 Effective Length	각도 Taper Angle	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
R 1	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	0.068	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
〃	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°	7,800	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
〃	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

2JJTB/3JJTBS Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material			합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M			고경도강 Hardened Steels STAVAX / SKD11			열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51		
경도 Hardness			40 ~ 45HRc			45 ~ 55HRc			55 ~ 62HRc			62 ~ 70HRc		
반경 Radius	유효장 Effective Length	각도 Taper Angle	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
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
절입량 Depth of Cut														

Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- 절삭조건에 없는 각도는 같은 직경에 이전 각도와 비례하여 사용하십시오.
- 이송속도 및 축방향의 절입깊이는 리브창과 테이퍼각에 따라 고려하시고, 절삭상황에 맞추어 조정하십시오.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동 가공 시 습식 쿨런트 추천합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 칩 제거 주의 및 가공시 발열, 발화에 주의하십시오.

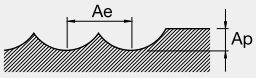
- If there is no same taper angle of your endmill on the table, refer to the previous taper angle of diameter and apply the same proportion.
- Adjust the value of the feed and Ap based on the effective length and taper angle, and adjust the milling condition.
- Air blow or mist coolant is recommended, and wet coolants are recommended for copper milling.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- 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.

2JJSP Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	공구강 / 금형강 Tool Steels / Alloy Steels SCM/HPM		합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M		스테인레스강 Stainless Steels SUS304/SUS316		고경도강 Hardened Steels STAVAX/SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11/ SKD61/ YXR7/ R7 / SKH51		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11/ SKD61/ YXR7/ R7 / SKH51	
경도 Hardness	30 ~ 40HRc		40 ~ 45HRc		-		45 ~ 55HRc		55 ~ 60HRc		60 ~ 70HRc	
반경 Radius	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R 0.5	25,600	680	25,600	680	25,600	680	25,600	680	25,600	610	25,600	610
R 0.75	22,000	850	22,000	850	22,000	850	22,000	850	22,000	750	22,000	750
R 1	19,200	1,080	19,200	1,080	19,200	1,080	19,200	1,080	19,200	960	17,600	960
R 2	12,400	1,440	11,200	1,240	10,800	1,160	10,000	1,080	10,000	920	8,800	920
R 3	8,400	1,480	7,600	1,360	7,200	1,280	6,800	1,200	6,800	1,040	5,900	1,040
R 4	6,400	1,120	5,700	1,000	5,500	960	5,100	880	5,100	790	4,400	790
R 5	5,100	880	4,600	800	4,400	784	4,000	720	4,000	640	3,600	640
R 6	4,800	840	3,800	670	3,640	640	3,400	600	3,400	540	3,000	540

절입량 Depth of Cut



Ap	Ae
0.05D	0.05D

~ 55HRC

Ap	Ae
0.02D	0.05D

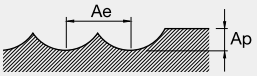
~ 70HRC

- 절삭조건의 ap, ae 수치는 황삭 및 황중삭의 수치 이므로, 견고한 조도의 가공을 원하시면 황삭 값의 50%를 적용 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건 표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

- The values of ap and ae on the table are for roughing or semi-roughing. If you need a great surface roughness, apply 50% of the 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, or found red heat on the material, adjust RPM and feed in the same proportion.

4JJSP/4JJSPM Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	공구강 / 금형강 Tool Steels / Alloy Steels SCM/HPM		합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M		스테인레스강 Stainless Steels SUS304/SUS316		고경도강 Hardened Steels STAVAX/SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11/ SKD61/ YXR7/ R7 / SKH51		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11/ SKD61/ YXR7/ R7 / SKH51	
경도 Hardness	30 ~ 40HRc		40 ~ 45HRc		-		45 ~ 55HRc		55 ~ 60HRc		60 ~ 70HRc	
반경 Radius	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R 0.5	25,600	806	25,600	806	25,600	806	25,600	806	25,600	723	25,600	723
R 0.75	22,000	1,007	22,000	1,007	22,000	1,007	22,000	1,007	22,000	889	22,000	889
R 1	19,200	1,280	19,200	1,280	19,200	1,280	19,200	1,280	19,200	1,138	17,600	1,138
R 2	12,400	1,706	11,200	1,469	10,800	1,375	10,000	1,280	10,000	1,090	8,800	1,090
R 3	8,400	1,754	7,600	1,612	7,200	1,517	6,800	1,422	6,800	1,232	5,900	1,232
R 4	6,400	1,327	5,700	1,185	5,500	1,138	5,100	1,043	5,100	936	4,400	936
R 5	5,100	1043	4,600	948	4,400	929	4,000	853	4,000	758	3,600	758
R 6	4,800	995	3,800	794	3,640	758	3,400	711	3,400	640	3,000	640
절삭량 Depth of Cut												

Ap	Ae
0.05D	0.05D

~ 55HRC

Ap	Ae
0.02D	0.05D

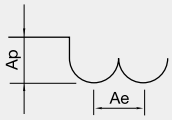
~ 70HRC

- 절삭조건의 ap, ae 수치는 황색 및 황중삭의 수치 이므로, 견고한 조도의 가공을 원하시면 황삭 값의 50%를 적용 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시에는 가공 형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
- 조건 표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

- The values of ap and ae on the table are for roughing or semi-roughing. If you need a great surface roughness, apply 50% of the 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, or found red heat on the material, adjust RPM and feed in the same proportion.

2JJSB/2JJB/3JJB/4JJSB/4JJB

■ 3JJB/4JJSB/4JJB 는RPM 동일 , FEED만최대 **50% Up** 적용
■ Use the same RPM and raise up the feed up to 50% for 3JJB/ 4JJSB/ 4JJB

피삭재 Material	고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness	45 ~ 55HRc				55 ~ 62HRc				62 ~ 70HRc			
반경 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
R 0.05	60,000	150	0.002	0.003	60,000	100	0.001	0.0012	52,500	30	0.001	0.002
R 0.1	60,000	180	0.002	0.003	60,000	120	0.002	0.003	45,000	60	0.002	0.003
R 0.15	45,000	310	0.004	0.007	43,500	180	0.003	0.005	32,500	90	0.003	0.005
R 0.2	37,500	420	0.007	0.012	35,000	240	0.005	0.008	26,250	120	0.005	0.008
R 0.25	33,000	530	0.010	0.02	30,000	300	0.007	0.01	22,500	150	0.007	0.01
R 0.3	30,000	1,200	0.02	0.1	26,500	800	0.01	0.075	20,000	400	0.01	0.075
R 0.4	27,000	1,600	0.04	0.17	23,500	1,000	0.02	0.12	17,500	500	0.02	0.12
R 0.5	24,000	2,000	0.1	0.3	21,000	1,750	0.05	0.2	16,000	875	0.05	0.2
R 0.6	21,000	2,000	0.1	0.3	18,000	1,750	0.05	0.2	14,500	875	0.05	0.2
R 0.75	17,000	2,000	0.12	0.4	15,000	1,750	0.06	0.29	11,250	875	0.06	0.29
R 1	14,000	2,100	0.15	0.5	12,250	1,800	0.08	0.35	9,200	900	0.08	0.35
R 1.25	12,250	2,150	0.17	0.6	10,700	1,850	0.1	0.45	8,050	925	0.1	0.45
R 1.5	10,500	2,200	0.2	0.7	9,200	1,900	0.12	0.55	6,900	950	0.12	0.55
R 2	9,000	2,300	0.25	0.95	7,900	2,000	0.15	0.75	5,900	1,000	0.15	0.75
R 2.5	7,800	2,500	0.25	1.05	6,800	2,100	0.15	0.85	5,100	1,050	0.15	0.85
R 3	6,500	2,500	0.3	1.3	5,700	2,200	0.2	1	4,300	1,100	0.2	1
R 4	5,200	2,200	0.4	1.7	4,500	1,900	0.25	1.35	3,400	950	0.25	1.35
R 5	4,300	2,000	0.5	2.1	3,750	1,750	0.3	1.7	2,800	875	0.3	1.7
R 6	3,600	1,750	0.6	2.6	3,150	1,500	0.35	2	2,350	750	0.35	2
절입량 Depth of Cut												

Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 날수 변화시 회전수는 유지하고, 피드는 안정적인 속도내에서 최대 50%까지 UP 해주십시오.(3JJB, 4JJSB, 4JJB)
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작 기계 사용 요망 합니다(Ø1 이하 사용 시 진동 허용 관리 5㎛ 이내일 것.)
- 에어브로 혹은 미스트 쿨런트를 추천 합니다.

- When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- Changing flutes from 3 to 4, use the same RPM and raise up the feed up to 50% in stable condition (3JJB, 4JJSB, 4JJB).
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management will be within 5㎛).
- Air blow or mist coolants are recommended.

2JJRE/4JJRE

■ 4JJRE는RPM 동일, FEED만 최대 **50% Up** 적용.
■ Use the same RPM and raise up the feed up to 50% for 4JJRE.

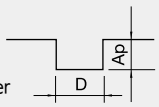
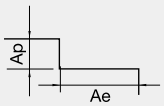
• RPM : rev./min • Feed : mm/min

피삭재 Material		합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness		40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	유효장 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 1	4	24,480	936	0.100	0.100	21,600	699	0.100	0.100	20,160	563	0.100	0.100
〃	6	22,032	773	0.040	0.040	19,440	577	0.040	0.040	18,144	465	0.040	0.040
〃	8	22,032	773	0.040	0.040	19,440	577	0.040	0.040	18,144	465	0.040	0.040
〃	10	22,032	773	0.025	0.025	19,440	577	0.025	0.025	18,144	465	0.025	0.025
〃	12	19,584	502	0.025	0.025	17,280	443	0.025	0.025	16,128	348	0.025	0.025
〃	14	19,584	502	0.025	0.025	17,280	443	0.025	0.025	16,128	348	0.025	0.025
〃	16	19,584	476	0.015	0.015	17,280	373	0.015	0.015	16,128	283	0.015	0.015
ø 1.2	6	21,760	764	0.084	0.084	19,200	570	0.084	0.084	17,920	460	0.084	0.084
〃	8	19,584	687	0.048	0.048	17,280	513	0.048	0.048	16,128	414	0.048	0.048
〃	10	19,584	687	0.030	0.030	17,280	513	0.030	0.030	16,128	414	0.030	0.030
〃	12	19,584	687	0.030	0.030	17,280	513	0.030	0.030	16,128	414	0.030	0.030
〃	16	17,408	611	0.020	0.020	15,360	456	0.020	0.020	14,336	368	0.020	0.020
ø 1.4	8	19,040	668	0.100	0.100	16,800	499	0.100	0.100	15,680	402	0.100	0.100
〃	10	17,136	601	0.056	0.056	15,120	449	0.056	0.056	14,112	362	0.056	0.056
〃	14	17,136	601	0.035	0.035	15,120	449	0.035	0.035	14,112	362	0.035	0.035
〃	16	15,232	391	0.035	0.035	13,440	345	0.035	0.035	12,544	271	0.035	0.035
ø 1.5	6	19,040	668	0.110	0.110	16,800	499	0.110	0.110	15,680	402	0.110	0.110
〃	8	19,040	668	0.110	0.110	16,800	499	0.110	0.110	15,680	402	0.110	0.110
〃	10	17,136	601	0.060	0.060	15,120	449	0.060	0.060	14,112	362	0.060	0.060
〃	12	17,136	601	0.060	0.060	15,120	449	0.060	0.060	14,112	362	0.060	0.060
〃	14	17,136	601	0.060	0.060	15,120	449	0.060	0.060	14,112	362	0.060	0.060
〃	16	15,232	391	0.038	0.038	13,440	345	0.038	0.038	12,544	271	0.038	0.038
〃	18	15,232	391	0.038	0.038	13,440	345	0.038	0.038	12,544	271	0.038	0.038
〃	20	15,232	391	0.038	0.038	13,440	345	0.038	0.038	12,544	271	0.038	0.038
〃	25	11,424	278	0.023	0.023	10,080	218	0.023	0.023	9,408	165	0.023	0.023
ø 1.6	10	15,912	621	0.040	0.040	14,040	463	0.040	0.040	13,104	373	0.040	0.040
〃	14	15,912	621	0.040	0.040	14,040	463	0.040	0.040	13,104	373	0.040	0.040
〃	18	15,912	621	0.040	0.040	14,040	463	0.040	0.040	13,104	373	0.040	0.040
ø 1.8	10	15,912	621	0.072	0.072	14,040	463	0.072	0.072	13,104	373	0.072	0.072
〃	14	15,912	621	0.072	0.072	14,040	463	0.072	0.072	13,104	373	0.072	0.072
〃	18	15,912	621	0.072	0.072	14,040	463	0.072	0.072	13,104	373	0.072	0.072
ø 2	6	14,280	668	0.200	0.200	12,600	499	0.200	0.200	11,760	402	0.200	0.200
〃	8	14,280	668	0.140	0.140	12,600	499	0.140	0.140	11,760	402	0.140	0.140
〃	10	14,280	668	0.140	0.140	12,600	499	0.140	0.140	11,760	402	0.140	0.140
〃	12	12,852	601	0.080	0.080	11,340	449	0.080	0.080	10,584	362	0.080	0.080
〃	14	12,852	601	0.080	0.080	11,340	449	0.080	0.080	10,584	362	0.080	0.080
〃	16	12,852	601	0.080	0.080	11,340	449	0.080	0.080	10,584	362	0.080	0.080
〃	18	12,852	601	0.050	0.050	11,340	449	0.050	0.050	10,584	362	0.050	0.050
〃	20	12,852	601	0.050	0.050	11,340	449	0.050	0.050	10,584	362	0.050	0.050
〃	25	11,424	391	0.050	0.050	10,080	345	0.050	0.050	9,408	271	0.050	0.050
〃	30	11,424	391	0.030	0.030	10,080	345	0.030	0.030	9,408	271	0.030	0.030
ø 2.5	12	12,240	716	0.180	0.180	10,800	535	0.180	0.180	10,080	431	0.180	0.180
〃	16	11,116	644	0.100	0.100	9,720	388	0.100	0.100	9,072	388	0.100	0.100
〃	20	11,116	644	0.100	0.100	9,720	481	0.100	0.100	9,072	388	0.100	0.100
ø 3	12	10,880	636	0.210	0.210	9,600	475	0.210	0.210	8,960	383	0.210	0.210
〃	16	9,792	573	0.120	0.120	8,640	428	0.120	0.120	8,064	345	0.120	0.120
〃	20	9792	573	0.12	0.120	8640	428	0.12	0.120	8064	345	0.12	0.120
〃	25	9792	573	0.08	0.080	8640	428	0.08	0.080	8064	345	0.08	0.080
〃	30	9792	573	0.08	0.080	8640	428	0.08	0.080	8064	345	0.08	0.080
〃	40	8704	509	0.05	0.050	7680	380	0.05	0.050	7168	307	0.05	0.050
ø 4	12	8000	1358	0.4	0.400	7050	902	0.4	0.400	6580	727	0.4	0.400
〃	16	8000	1358	0.4	0.400	7050	902	0.4	0.400	6580	727	0.4	0.400
〃	20	7800	1200	0.3	0.300	6800	800	0.3	0.300	6200	720	0.3	0.300
〃	25	7800	1200	0.3	0.300	6800	800	0.3	0.300	6200	720	0.3	0.300
〃	30	7800	1200	0.3	0.300	6800	800	0.3	0.300	6200	720	0.3	0.300
〃	35	7600	1150	0.2	0.200	6700	780	0.2	0.200	6000	700	0.2	0.200
〃	40	7600	1150	0.2	0.200	6700	780	0.2	0.200	6000	700	0.2	0.200
〃	45	7600	1150	0.2	0.200	6700	780	0.2	0.200	6000	700	0.2	0.200
〃	50	7600	1150	0.2	0.200	6700	780	0.2	0.200	6000	700	0.2	0.200
ø 5	16	7400	1060	0.60	0.600	6600	760	0.4	0.400	5900	680	0.4	0.400
〃	20	7400	1060	0.60	0.600	6600	760	0.4	0.400	5900	680	0.4	0.400
〃	25	7400	1060	0.450	0.450	6600	760	0.3	0.300	5900	680	0.3	0.300
〃	30	7200	1000	0.300	0.300	6200	740	0.2	0.200	5800	650	0.2	0.200
〃	35	7200	1000	0.300	0.300	6200	740	0.2	0.200	5800	650	0.2	0.200
〃	40	7000	980	0.300	0.300	6000	700	0.2	0.200	5600	620	0.2	0.200
〃	50	7000	980	0.300	0.300	6000	700	0.2	0.200	5600	620	0.2	0.200
ø 6	20	6800	950	0.150	0.150	5800	680	0.1	0.100	5400	600	0.1	0.100
〃	30	6800	950	0.150	0.150	5800	680	0.1	0.100	5400	600	0.1	0.100

2JJRE/4JJRE

■ 4JJRE는 RPM 동일 , FEED만최대 **50% Up** 적용.
■ Use the same RPM and raise up the feed up to 50% for 4JJRE.

• RPM : rev./min • Feed : mm/min

피삭재 Material		합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness		38 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	유효장 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
〃	40	6800	950	0.150	0.150	5800	680	0.1	0.100	5400	600	0.1	0.100
〃	50	6500	900	0.135	0.135	5600	650	0.09	0.090	5000	560	0.09	0.090
〃	60	6500	900	0.135	0.135	5600	650	0.09	0.090	5000	560	0.09	0.090
절입량 Depth of Cut		Slotting • Ap : Axial Depth • D : Outside Diameter 				Side Milling • Ap : Axial Depth • Ae : Radial Depth 							

- 4날시 회전수는 유지하고, 피드는 안정적인 속도내에서 최대 50%까지 UP 해주십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC65 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시에는 가공 형상, 가공 목적, 적용 기계 등에 따라 조건을 조정 하십시오.
- 조건 표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작 기계 사용 요망 합니다(Ø1 이하 사용 시 진동 허용 관리 5㎛ 이내일 것.)
- 에어브로, 절삭유, 오일미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

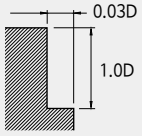
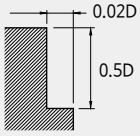
- For 4JJRE, use the same RPM and raise up the feed up to 50% in stable condition.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling hardened material, HRC over 65, decrease by 20% RPM and feed compared to the same diameter.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management will be within 5㎛.)
- Air blow or mist coolants are recommended and note for chip emission, heat or ignition.

4JJE Cutting Condition

피삭재 Material	합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M		고경도강 Hardened Steels STAVAX/SKD11	
경도 Hardness	40 ~ 45HRc		45 ~ 55HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED
Ø 1	31,500	1,050	20,300	710
Ø 2	20,200	1,250	14,300	840
Ø 3	14,300	1,250	8,500	840
Ø 4	11,400	1,300	7,200	880
Ø 5	10,500	1,500	6,700	1,000
Ø 6	8,450	1,400	5,600	950
Ø 7	7,800	1,380	4,200	900
Ø 8	6,500	1,350	3,830	840
Ø 9	6,150	1,260	3,500	840
Ø 10	5,250	1,260	2,800	800
Ø 11	4,300	1,150	2,500	800
Ø 12	4,300	1,150	2,300	760
Ø 14	3,500	1,050	2,100	760
Ø 16	3,500	1,050	2,000	700
Ø 18	2,800	1,000	2,000	700
Ø 20	2,600	980	1,800	650

4JJHE

6&8JJHE : RPM 동일, FEED만 최대 **50% Up** 적용.
Use the same RPM, raise up the feed up to 50%

피삭재 Material	열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness	55 ~ 62HRc				62 ~ 70HRc			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
Ø 1	32,000	800	0.5	0.02	28,000	500	0.5	0.02
Ø 1.5	30,000	900	0.75	0.03	25,000	550	0.75	0.03
Ø 2	24,000	1,000	1	0.04	16,000	600	1	0.04
Ø 3	38,400	1,600	1.5	0.06	19,200	1,140	1.5	0.06
Ø 4	28,800	1,850	2	0.08	14,400	1,320	2	0.08
Ø 5	24,000	2,100	2.5	0.1	12,000	1,500	2.5	0.1
Ø 6	19,200	2,430	3	0.12	9,600	1,740	3	0.12
Ø 8	14,400	2,430	4	0.16	7,200	1,740	4	0.16
Ø 10	11,520	2,430	5	0.2	5,760	1,740	5	0.2
Ø 12	9,600	2,010	6	0.24	4,800	1,440	6	0.24
Ø 16	7,200	1,500	8	0.32	3,600	1,080	8	0.32
Ø 20	5,760	1,200	10	0.4	2,880	850	10	0.4
절입량 Depth of Cut	~ 55HRC 				55HRC ~ 			

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- JJHE의 6~8날 가공시 회전수는 유지하고, 안정적인 속도내에서 피드를 최대 50%까지 UP 해주십시오.
- JJHE Series 제품은 홈절삭보다 측면절삭에 효율이 높은점 참고 바랍니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 소재 및 가공 형상에 적합한 절삭유를 사용하십시오.

- When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- For 6-8 flutes of JJHE, keep the RPM and raise up the feed up to 50% in the stable milling condition.
- Note that JJHE series performs better in side milling rather than groove milling.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use suitable cutting oil for material and machining geometry.

2JJE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	홈 절삭 Slotting						측면절삭 Side Cutting					
	고경도강 Hardened Steels STAVAX/SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61		열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51		고경도강 Hardened Steels STAVAX/SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61		열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51	
경도 Hardness	45 ~ 55HRc		55 ~ 65HRc		62 ~ 70HRc		45 ~ 55HRc		55 ~ 62HRc		62 ~ 70HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø 0.1	33,000	50	33,000	40	26,400	30	• 측면절삭불가 • Side cutting is not possible.					
ø 0.2	33,000	60	33,000	45	20,000	35						
ø 0.3	33,000	70	25,000	50	20,000	40						
ø 0.4	33,000	90	25,000	55	20,000	60						
ø 0.5	33,000	140	25,000	85	20,000	75						
ø 0.6	30,000	160	25,000	105	15,200	80						
ø 0.8	25,000	185	19,000	110	14,000	90						
ø 0.9	22,700	205	17,500	125	12,500	85						
ø 1	20,500	670	16,000	340	12,500	160	20,500	775	16,000	340	12,500	323
ø 2	14,500	800	11,000	400	9,500	210	14,500	925	11,000	415	9,500	394
ø 3	9,500	800	7,500	400	6,400	210	9,500	925	7,500	415	6,400	394
ø 4	7,200	840	5,600	425	4,750	220	7,200	960	5,600	430	4,750	409
ø 5	6,400	885	5,100	450	4,450	245	6,400	1,020	5,100	470	4,450	447
ø 6	5,300	870	4,200	450	3,700	240	5,300	1,000	4,200	460	3,700	437
ø 8	4,000	800	3,200	400	2,800	220	4,000	910	3,200	425	2,800	404
ø 10	3,200	750	2,550	390	2,200	210	3,200	850	2,550	400	2,200	380
ø 12	2,650	750	2,100	390	1,860	210	2,650	850	2,100	400	1,860	380
ø 16	1,840	560	1,800	250	1,460	185	1,840	750	1,800	340	1,800	323
ø 18	1,840	560	1,800	250	1,460	185	1,840	750	1,800	340	1,800	323
ø 20	1,460	560	1,400	250	1,100	185	1,460	750	1,400	325	1,400	309
절입량 Depth of Cut	0.8D, 0.05D ~ 60HRC 0.5D, 0.02D 60HRC ~						~ 60HRC: 0.03D, 1.0D 60HRC ~: 0.02D, 0.5D					

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실가 공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 소재 및 가공 형상에 적합한 절삭유를 사용하십시오.

- When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use suitable cutting oil for material and machining geometry.

2JJCR / 2JJTC Cutting Condition

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

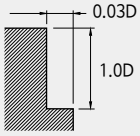
피삭재 Material		고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		45 ~ 55HRc				55 ~ 62HRc				62 ~ 70HRc			
외경 Outside Diameter	반경 Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.4	R 0.1	33,000	105	0.01	0.01	25,000	60	0.005	0.008	25,000	60	0.005	0.008
ø 0.5	R 0.1	33,000	110	0.015	0.02	25,000	65	0.007	0.010	20,000	40	0.007	0.010
ø 0.8	R 0.2	30,000	125	0.02	0.10	25,000	85	0.01	0.075	20,000	50	0.01	0.075
ø 1	R 0.3	25,000	226	0.04	0.15	19,000	131	0.02	0.12	16,000	74	0.02	0.12
ø 1.5	R 0.5	20,500	268	0.10	0.30	16,000	157	0.05	0.20	12,500	95	0.05	0.20
ø 2	R 0.5	14,500	324	0.15	0.50	11,000	186	0.1	0.25	9,500	124	0.10	0.30
ø 2.5	R 0.5	9,500	324	0.20	0.50	7,500	186	0.12	0.35	6,400	124	0.12	0.40
ø 3	R 0.5	9,500	324	0.20	0.50	7,500	186	0.12	0.35	6,400	124	0.12	0.40
ø 4	R 0.3	7,200	337	0.25	0.30	5,600	197	0.15	0.20	4,750	127	0.15	0.30
ø 5	R 0.5	6,400	356	0.25	0.50	5,100	209	0.15	0.50	4,450	142	0.15	0.40
〃	R 1	6,400	356	0.40	1.05	5,100	209	0.35	0.80	4,450	142	0.30	0.70
ø 6	R 0.5	5,300	349	0.20	0.70	4,200	209	0.2	0.60	3,700	140	0.20	0.50
〃	R 1	5,300	349	0.30	1.00	4,200	209	0.3	0.80	3,700	140	0.20	0.65
〃	R 1.5	5,300	349	0.50	1.30	4,200	209	0.4	1.00	3,700	140	0.30	0.80
ø 8	R 0.5	4,000	318	0.30	0.70	3,200	191	0.20	0.60	2,800	130	0.20	0.50
〃	R 1	4,000	318	0.40	1.00	3,200	191	0.25	0.90	2,800	130	0.25	0.70
〃	R 1.5	4,000	318	0.40	1.30	3,200	191	0.25	1.20	2,800	130	0.25	0.80
ø 10	R 0.5	3,200	300	0.40	0.80	2,550	180	0.2	0.60	2,200	122	0.20	0.50
〃	R 1	3,200	300	0.50	1.00	2,550	180	0.3	0.80	2,200	122	0.30	0.80
〃	R 2	3,200	300	0.50	1.70	2,550	180	0.3	1.50	2,200	122	0.30	1.30
ø 12	R 0.5	2,650	300	0.50	1.00	2,100	180	0.35	0.80	1,860	122	0.20	0.60
〃	R 1	2,650	300	0.60	1.30	2,100	180	0.35	1.20	1,860	122	0.30	1.00
〃	R 2	2,650	300	0.60	1.80	2,100	180	0.35	1.70	1,860	122	0.30	1.40
〃	R 3	2,650	300	0.60	2.50	2,100	180	0.40	2.00	1,860	122	0.30	1.80

측면절삭 Side Cutting

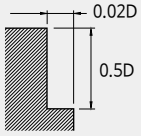
피삭재 Material	고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness	45 ~ 55HRc				55 ~ 62HRc				62 ~ 70HRc			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.4	33,000	105	0.40	0.012	25,000	60	0.2	0.008	25,000	60	0.2	0.008
ø 0.5	33,000	110	0.50	0.015	25,000	65	0.25	0.010	20,000	40	0.25	0.010
ø 0.8	30,000	125	0.80	0.024	25,000	85	0.4	0.016	20,000	50	0.4	0.016
ø 1	25,000	145	1.00	0.030	19,000	128	0.5	0.02	16,000	74	0.5	0.02
ø 2	14,500	208	2.00	0.060	11,000	129	1	0.04	9,500	76	1	0.04
ø 3	9,500	208	3.00	0.090	7,500	131	1.5	0.06	6,400	77	1.5	0.06
ø 4	7,200	216	4.00	0.120	5,600	132	2	0.08	4,750	78	2	0.08
ø 6	5,300	224	6.00	0.180	4,200	133	3	0.12	3,700	80	3	0.12
ø 8	4,000	204	8.00	0.240	3,200	135	4	0.16	2,800	81	4	0.16
ø 10	3,200	192	10.00	0.300	2,550	136	5	0.20	2,200	82	5	0.20
ø 12	2,650	192	12.00	0.360	2,100	138	6	0.24	1,860	84	6	0.24

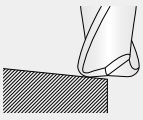
절입량 Depth of Cut

~ 60HRC



60HRC ~





경사진면절삭 Inclined Cutting

- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 측면 절삭시 코너R 부분과 각도내용을 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 에어브로, 절삭유, 오일미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- For side milling, refer to the corner radius and
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed by 30% in stable condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

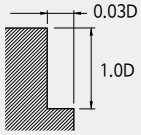
4JJCR/6JJCR/4JJTC

■ 6JJCR은 RPM 동일, FEED만 최대 **50% Up** 적용.
■ Use the same RPM and raise up the feed up to 50% for 6JJCR.

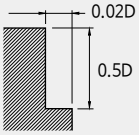
피삭재 Material		고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		45 ~ 55HRc				55 ~ 62HRc				62~ 70HRc			
외경 Outside Diameter	반경 Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.5	R 0.1	33,000	365	0.015	0.013	25,000	245	0.007	0.010	20,000	140	0.007	0.010
ø 0.6	R 0.1	30,000	380	0.02	0.098	25,000	250	0.01	0.075	20,000	150	0.01	0.075
ø 0.7	R 0.1	28,000	390	0.03	0.104	21,000	255	0.01	0.080	18,000	150	0.01	0.080
ø 0.8	R 0.1	25,500	400	0.04	0.120	19,000	260	0.02	0.10	16,000	155	0.02	0.10
ø 1	R 0.1	20,500	710	0.08	0.156	16,000	392	0.04	0.12	12,500	236	0.03	0.12
〃	R 0.3	20,500	710	0.10	0.104	16,000	393	0.05	0.08	12,500	238	0.05	0.06
ø 1.5	R 0.1	18,000	759	0.12	0.125	13,000	394	0.07	0.10	10,500	239	0.05	0.08
〃	R 0.5	18,000	759	0.15	0.156	13,000	396	0.10	0.12	10,500	240	0.07	0.10
ø 2	R 0.1	14,500	858	0.15	0.156	11,000	397	0.10	0.12	9,500	242	0.10	0.10
〃	R 0.5	14,500	858	0.18	0.187	11,000	399	0.10	0.14	9,500	243	0.10	0.12
ø 2.5	R 0.1	11,500	858	0.16	0.166	8,500	400	0.10	0.13	7,500	244	0.10	0.10
〃	R 0.5	11,500	858	0.19	0.198	8,500	402	0.10	0.15	7,500	246	0.10	0.12
ø 3	R 0.1	9,500	858	0.16	0.166	7,500	403	0.12	0.13	6,400	247	0.12	0.10
〃	R 0.5	9,500	858	0.18	0.187	7,500	405	0.12	0.14	6,400	248	0.12	0.12
〃	R 1	9,500	858	0.20	0.208	7,500	406	0.12	0.16	6,400	250	0.12	0.13
ø 4	R 0.1	7,200	891	0.20	0.208	5,600	407	0.12	0.16	4,750	251	0.12	0.13
〃	R 0.5	7,200	891	0.25	0.260	5,600	409	0.12	0.20	4,750	252	0.15	0.16
〃	R 1	7,200	891	0.25	0.260	5,600	410	0.15	0.20	4,750	254	0.15	0.16
ø 5	R 0.1	6,400	957	0.25	0.260	5,100	412	0.12	0.20	4,450	255	0.12	0.16
〃	R 0.5	6,400	957	0.28	0.291	5,100	413	0.15	0.22	4,450	257	0.15	0.18
〃	R 1	6,400	957	0.30	0.312	5,100	415	0.15	0.24	4,450	258	0.15	0.19
ø 6	R 0.1	5,300	924	0.30	0.312	4,200	416	0.20	0.24	3,700	259	0.20	0.19
〃	R 0.5	5,300	924	0.30	0.312	4,200	418	0.20	0.24	3,700	261	0.20	0.19
〃	R 1	5,300	924	0.40	0.416	4,200	419	0.25	0.32	3,700	262	0.25	0.26
〃	R 1.5	5,300	924	0.40	0.416	4,200	421	0.25	0.32	3,700	263	0.25	0.26
ø 8	R 0.5	4,000	858	0.30	0.312	3,200	422	0.20	0.24	2,800	265	0.20	0.19
〃	R 1	4,000	858	0.30	0.312	3,200	423	0.20	0.24	2,800	266	0.20	0.19
〃	R 1.5	4,000	858	0.40	0.416	3,200	425	0.25	0.32	2,800	267	0.25	0.26
〃	R 2	4,000	858	0.50	0.520	3,200	426	0.30	0.40	2,800	269	0.25	0.32
ø 10	R 0.5	3,200	792	0.40	0.416	2,550	428	0.20	0.32	2,200	270	0.20	0.26
〃	R 1	3,200	792	0.45	0.468	2,550	429	0.25	0.36	2,200	271	0.25	0.29
〃	R 1.5	3,200	792	0.50	0.520	2,550	431	0.30	0.40	2,200	273	0.30	0.32
〃	R 2	3,200	792	0.50	0.520	2,550	432	0.30	0.40	2,200	274	0.30	0.32
〃	R 2.5	3,200	792	0.50	0.520	2,550	434	0.30	0.40	2,200	275	0.30	0.32
ø 12	R 0.5	2,650	792	0.50	0.520	2,100	435	0.35	0.40	1,860	277	0.30	0.32
〃	R 1	2,650	792	0.70	0.728	2,100	436	0.35	0.56	1,860	278	0.35	0.45
〃	R 1.5	2,650	792	0.80	0.832	2,100	438	0.40	0.64	1,860	279	0.35	0.51
〃	R 2	2,650	792	0.80	0.832	2,100	439	0.40	0.64	1,860	281	0.35	0.51
〃	R 3	2,650	792	0.80	0.832	2,100	441	0.40	0.64	1,860	282	0.35	0.51

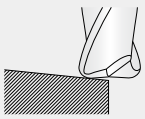
절입량 Depth of Cut

~ 60HRC



60HRC ~





경사진면절삭 Inclined Cutting

- 상기 조건표는 홈 절삭 조건표이며, 측면 절삭시 절입기준표를 참고바랍니다.
- HRC55 이하 피삭재(합금강, 공구강) 가공시 같은 파이에 대비 상기 절삭조건의 20% UP 해주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 6날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 50%까지 UP 해주십시오.

- Above the table is a reference for groove milling, and refer to the depth of cut for side milling.
- When milling workpiece, HRC below 55 (Alloy steel, tool steel), Raise up 20% RPM and feed compared to the same diameter.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- For curved milling, use the lower value of pitch than corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable condition.
- With 6flutes milling, raise up the feed up to 50% in stable condition.

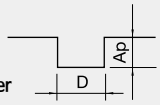
2JJC Cutting Condition

• RPM : rev./min • Feed : mm/min

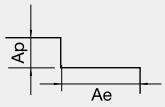
피삭재 Material		고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		45 ~ 55HRc				55 ~ 62HRc				62 ~ 70HRc			
외경 Outside Diameter	반경 Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.2	R 0.02	40,000	55	0.005	0.005	37,000	30	0.002	0.005	36,000	30	0.003	0.005
ø 0.3	R 0.02	40,000	60	0.007	0.007	37,000	35	0.003	0.006	36,000	35	0.004	0.006
ø 0.4	R 0.1	33,000	70	0.010	0.01	25,000	40	0.005	0.008	25,000	40	0.005	0.008
ø 0.5	R 0.1	33,000	80	0.015	0.02	25,000	45	0.007	0.010	20,000	30	0.007	0.010
ø 0.6	R 0.2	30,000	90	0.02	0.10	25,000	60	0.01	0.075	20,000	35	0.01	0.075
ø 0.8	R 0.2	25,000	100	0.04	0.15	19,000	65	0.02	0.12	16,000	40	0.02	0.12
ø 1	R 0.3	20,500	583	0.10	0.30	16,000	281	0.05	0.20	12,500	175	0.05	0.20
ø 1.5	R 0.1	16,500	623	0.12	0.35	13,000	283	0.07	0.30	10,500	177	0.07	0.30
ø 2	R 0.1	14,500	696	0.15	0.40	11,000	285	0.10	0.35	9,500	179	0.10	0.30
ø 2.5	R 0.1	11,500	696	0.20	0.60	8,800	287	0.12	0.40	7,400	180	0.10	0.35
〃	R 0.5	11,500	696	0.21	0.60	8,800	289	0.12	0.45	7,400	182	0.10	0.40
ø 3	R 0.1	9,500	705	0.20	0.50	7,500	290	0.15	0.55	6,400	184	0.12	0.45
〃	R 0.5	9,500	705	0.22	0.50	7,500	292	0.15	0.55	6,400	186	0.12	0.45
〃	R 1	9,500	705	0.25	0.70	7,500	294	0.20	0.65	6,400	187	0.16	0.55
ø 4	R 0.1	7,200	724	0.25	0.95	5,600	296	0.15	0.75	4,750	189	0.15	0.65
〃	R 0.5	7,200	724	0.25	0.95	5,600	298	0.15	0.75	4,750	191	0.15	0.65
〃	R 1	7,200	724	0.30	1.20	5,600	300	0.20	1.00	4,750	193	0.20	0.90
ø 5	R 0.1	6,400	771	0.20	0.90	5,100	302	0.15	0.70	4,450	194	0.15	0.85
〃	R 0.5	6,400	771	0.20	0.90	5,100	303	0.15	0.70	4,450	196	0.15	0.85
〃	R 1	6,400	771	0.25	1.10	5,100	305	0.20	0.90	4,450	198	0.20	1.00
ø 6	R 0.5	5,300	752	0.30	1.30	4,200	307	0.20	0.80	3,700	200	0.20	0.80
〃	R 1	5,300	752	0.30	1.30	4,200	309	0.20	0.80	3,700	201	0.20	0.80
〃	R 1.5	5,300	752	0.30	1.40	4,200	311	0.25	1.20	3,700	203	0.25	1.20
〃	R 2.5	5,300	752	0.30	1.40	4,200	313	0.25	1.20	3,700	205	0.25	1.20
ø 8	R 0.5	4,000	686	0.30	1.70	3,200	315	0.25	1.35	2,800	207	0.25	1.35
〃	R 1	4,000	686	0.30	1.70	3,200	316	0.25	1.35	2,800	208	0.25	1.35
〃	R 1.5	4,000	686	0.30	1.70	3,200	318	0.25	1.35	2,800	210	0.25	1.35
〃	R 2	4,000	686	0.40	2.00	3,200	320	0.25	1.50	2,800	212	0.30	1.40
〃	R 2.5	4,000	686	0.40	2.00	3,200	322	0.25	1.50	2,800	214	0.30	1.40
〃	R 3	4,000	686	0.40	2.00	3,200	324	0.25	1.50	2,800	215	0.30	1.40
ø 10	R 0.5	3,200	639	0.50	2.10	2,550	326	0.30	1.70	2,200	217	0.30	1.50
〃	R 1	3,200	639	0.50	2.10	2,550	327	0.30	1.70	2,200	219	0.30	1.50
〃	R 1.5	3,200	639	0.60	2.40	2,550	329	0.30	1.80	2,200	221	0.30	1.60
〃	R 2	3,200	639	0.60	2.40	2,550	331	0.30	1.80	2,200	222	0.30	1.60
〃	R 2.5	3,200	639	0.60	2.40	2,550	333	0.30	1.80	2,200	224	0.30	1.60
ø 12	R 0.5	2,650	639	0.80	2.50	2,100	335	0.40	2.00	1,860	226	0.35	1.80
〃	R 1	2,650	639	0.80	2.50	2,100	337	0.40	2.00	1,860	228	0.35	1.80
〃	R 1.5	2,650	639	0.80	2.50	2,100	339	0.40	2.00	1,860	229	0.35	1.80
〃	R 2	2,650	639	1.00	2.60	2,100	340	0.50	2.10	1,860	231	0.40	2.00
〃	R 2.5	2,650	639	1.00	2.60	2,100	342	0.50	2.10	1,860	233	0.40	2.00
〃	R 3	2,650	639	1.00	2.60	2,100	344	0.50	2.10	1,860	235	0.40	2.00

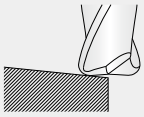
절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth





경사진면절삭 Inclined Cutting

- 상기 조건표는 홈 절삭 조건표이며, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대30%까지 UP 해주십시오.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 에어브로 혹은 미스트 쿨런트를 추천하며 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- Above the table is a reference for groove milling, and adjust parameters depending on material shape, milling purpose, and CNC machine.
- For curved milling, set up the pitch value lower than corner radius value.
- For curved milling, raise up the feed up to 30% in stable condition.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

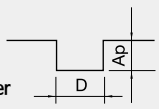
4JJC Cutting Condition

• RPM : rev./min • Feed : mm/min

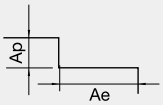
피삭재 Material		고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		45 ~ 55HRc				55 ~ 62HRc				62 ~ 70HRc			
외경 Outside Diameter	반경 Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.5	R 0.1	33,000	85	0.01	0.01	25,000	55	0.01	0.01	25,000	45	0.01	0.01
ø 0.6	R 0.1	33,000	95	0.02	0.02	25,000	60	0.01	0.01	20,000	50	0.01	0.01
ø 0.7	R 0.1	30,000	115	0.02	0.10	25,000	75	0.01	0.08	20,000	55	0.01	0.08
ø 0.8	R 01	25,000	120	0.04	0.15	19,000	85	0.02	0.12	16,000	60	0.02	0.12
ø 0.9	R 0.1	23,000	160	0.06	0.18	17,500	110	0.03	0.15	14,500	95	0.03	0.14
ø 1	R 0.3	20,500	344	0.10	0.30	16,000	216	0.05	0.20	12,500	140	0.05	0.20
ø 1.5	R 0.1	18,000	388	0.10	0.30	13,000	235	0.07	0.30	10,500	160	0.08	0.25
〃	R 0.5	18,000	388	0.13	0.40	13,000	235	0.07	0.30	10,500	160	0.08	0.25
ø 2	R 0.1	14,500	416	0.15	0.50	11,000	256	0.10	0.45	9,500	184	0.10	0.45
〃	R 0.5	14,500	416	0.15	0.50	11,000	256	0.10	0.45	9,500	184	0.10	0.45
ø 2.5	R 0.1	9,500	416	0.20	0.70	7,500	256	0.12	0.55	6,400	184	0.12	0.55
〃	R 0.5	9,500	416	0.20	0.70	7,500	256	0.12	0.55	6,400	184	0.12	0.55
ø 3	R 0.5	8,300	424	0.23	0.80	6,400	268	0.13	0.60	5,600	192	0.13	0.60
〃	R 1	8,300	424	0.23	0.80	6,400	268	0.13	0.60	5,600	192	0.13	0.60
ø 3.5	R 0.5	7,800	432	0.25	0.90	6,000	268	0.13	0.70	5,200	192	0.14	0.70
ø 4	R 0.5	7,200	432	0.25	0.95	5,600	268	0.15	0.75	4,750	192	0.15	0.75
〃	R 1	7,200	432	0.25	1.00	5,600	268	0.15	0.80	4,750	192	0.15	0.80
ø 4.5	R 0.5	6,400	464	0.25	1.05	5,100	296	0.15	0.85	4,450	216	0.15	0.85
ø 5	R 0.5	6,400	464	0.25	1.05	5,100	296	0.15	0.85	4,450	216	0.15	0.85
〃	R 1	6,400	464	0.30	1.20	5,100	296	0.17	0.90	4,450	216	0.17	0.85
ø 6	R 0.5	5,300	448	0.30	1.30	4,200	280	0.20	1.00	3,700	208	0.20	0.90
〃	R 1	5,300	448	0.30	1.40	4,200	296	0.20	1.00	3,700	216	0.20	0.90
〃	R 1.5	5,300	448	0.35	1.50	4,200	280	0.23	1.20	3,700	208	0.22	1.20
〃	R 2	5,300	448	0.35	1.60	4,200	296	0.23	1.20	3,700	216	0.22	1.20
ø 8	R 0.5	4,000	416	0.40	1.70	3,200	264	0.25	1.35	2,800	192	0.25	1.30
〃	R 1	4,000	416	0.40	1.70	3,200	264	0.25	1.35	2,800	192	0.25	1.30
〃	R 1.5	4,000	416	0.45	2.00	3,200	264	0.28	1.50	2,800	192	0.27	1.40
〃	R 2	4,000	416	0.45	2.00	3,200	264	0.28	1.50	2,800	192	0.27	1.40
ø 10	R 0.5	3,200	384	0.50	2.10	2,550	248	0.30	1.70	2,200	176	0.30	1.70
〃	R 1	3,200	384	0.50	2.10	2,550	248	0.30	1.70	2,200	176	0.30	1.70
〃	R 1.5	3,200	384	0.55	2.30	2,550	248	0.35	1.80	2,200	176	0.35	1.80
〃	R 2	3,200	384	0.55	2.30	2,550	248	0.35	1.90	2,200	176	0.35	1.90
〃	R 2.5	3,200	384	0.60	2.30	2,550	248	0.35	1.90	2,200	176	0.35	1.90
ø 12	R 0.5	2,650	384	0.60	2.60	2,100	240	0.35	2.00	1,860	176	0.35	2.00
〃	R 1	2,650	384	0.60	2.60	2,100	240	0.35	2.00	1,860	176	0.35	2.00
〃	R 1.5	2,650	384	0.60	2.60	2,100	240	0.35	2.00	1,860	176	0.35	2.00
〃	R 2	2,650	384	0.60	2.60	2,100	240	0.35	2.00	1,860	176	0.35	2.00
〃	R 2.5	2,650	384	0.80	3.00	2,100	240	0.50	2.20	1,860	176	0.45	2.30
〃	R 3	2,650	384	1.00	3.00	2,100	240	0.65	2.40	1,860	176	0.55	2.50

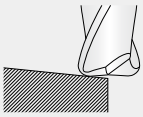
절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth





경사진면절삭 Inclined Cutting

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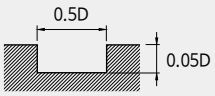
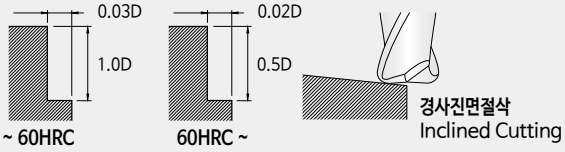
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대30%까지 UP 해주십시오.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 에어브로 혹은 미스트 쿨런트를 추천하며 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- Above the table is a reference for groove milling, and adjust parameters depending on material shape, milling purpose, and CNC machine.
- For curved milling, set up the pitch value lower than corner radius value.
- For curved milling, raise up the feed up to 30% in stable condition.
- If the table over the maximum RPM and feed of your machine, adjust RPM and feed in the same proportion.
- Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

4&6JJCRL Cutting Condition

• RPM : rev./min • Feed : mm/min

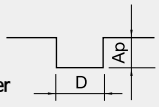
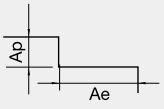
	홈절삭 Slotting						측면절삭 Side Cutting					
피삭재 Material	합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M		고경도강 Hardened Steels STAVAX/SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61		합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M		고경도강 Hardened Steels STAVAX/SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness	40 ~ 45HRc		45 ~ 55HRc		55 ~ 62HRc		40 ~ 45HRc		45 ~ 55HRc		55 ~ 62HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø 1	28,000	500	25,500	300	18,500	150	30,000	500	28,000	430	24,500	300
ø 2	14,820	700	13,500	400	9,500	200	16,500	700	14,300	600	12,500	450
ø 3	7,800	800	6,900	400	6,000	220	11,500	1,100	10,500	860	9,500	650
ø 4	7,150	800	6,100	450	5,750	250	9,200	1,100	7,600	900	7,100	680
ø 5	6,500	900	5,700	510	5,100	300	7,200	1,200	6,400	950	6,000	720
ø 6	6,100	1,000	5,150	520	4,850	320	6,200	1,300	5,300	1,040	4,950	810
ø 8	5,800	1,100	4,810	520	4,150	330	4,800	1,400	4,100	1,120	3,900	820
ø 10	5,500	1,200	4,200	500	3,850	310	3,700	1,300	3,000	1,030	2,600	810
ø 12	5,100	1,100	3,950	450	3,500	290	3,000	1,200	2,700	980	2,100	780
ø 16	4,750	1,100	3,700	430	3,200	290	2,750	1,200	2,450	980	1,950	760
절입량 Depth of Cut												

- 안정적인 절삭을 위해 홈 가공시 날경의 코너R을 유의하여 ae 값을 설정 하십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대 30%이하로 줄이십시오.
- HRC60 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 피삭재와 절삭형상을 위한 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

- For stable cutting, set the ae value by paying attention to the corner radius during grooving machining.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- In case the material of HRC over 60, reduce the RPM and feed by 20%.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

4&6JJDRC Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		50 ~ 55HRC				55 ~ 62HRc				62 ~ 66HRc				66 ~ 72HRc			
외경 Outside Diameter	날수 No. of flutes	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
ø 1	4	30,250	8,250	0.04	0.6	20,700	5,500	0.02	0.6	17,510	5,200	0.018	0.6	14,330	2,250	0.013	0.5
ø 2	4	15,100	8,250	0.08	1.2	10,350	5,500	0.04	1.2	8,760	5,100	0.036	1.2	7,170	2,250	0.026	1.0
ø 3	4	10,000	8,580	0.12	1.8	6,900	5,750	0.06	1.8	5,840	4,850	0.054	1.8	4,780	2,320	0.039	1.5
ø 4	4	7,560	8,190	0.16	2.4	5,170	7,000	0.08	2.4	4,380	4,250	0.072	2.4	3,580	2,800	0.052	2.0
ø 5	4	6,050	8,520	0.20	3.0	4,140	7,250	0.10	3.0	3,500	4,250	0.090	3.0	2,870	3,000	0.065	2.5
ø 6	6	5,040	13,170	0.24	3.6	3,450	9,250	0.12	3.6	2,920	6,500	0.108	3.6	2,390	3,700	0.078	3.0
ø 8	6	3,780	13,800	0.28	4.2	2,590	9,250	0.14	4.2	2,190	6,825	0.144	4.2	1,790	3,950	0.091	3.5
ø 10	6	3,025	13,590	0.32	4.8	2,070	9,100	0.16	4.8	1,750	6,500	0.181	4.8	1,430	4,000	0.104	4.0
ø 12	6	2,520	12,990	0.36	5.4	1,720	10,725	0.18	5.4	1,460	6,000	0.217	5.4	1,200	3,900	0.117	4.5
절입량 Depth of Cut																	

- 날경 보다 낮은 이동 PITCH를 설정 하십시오. (날경 보다 클 시 경우 CUSP가 남는다)
- 윤곽 가공에 가장 적합한 제품으로, 가능한 가공성이 좋은 기계를 사용 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.

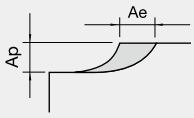
- Use lower value of pitch than tool diameter. If not, cusp will appear on the workpiece.
- Contouring machining method is the most recommended, and use great rigidity of CNC.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If your CNC machine cannot run enough RPM and Feed, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

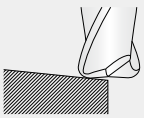
4&6JJRC Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness		40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	반경 Corner 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
ø 1	R 0.2	42,000	7,605	0.02	0.40	35,000	6,375	0.015	0.30	25,000	5,689	0.015	0.30
ø 1.5	R 0.5	40,000	7,800	0.02	0.60	30,000	6,376	0.025	0.50	21,000	5,691	0.023	0.50
ø 2	R 0.5	27,000	8,190	0.03	0.80	24,000	6,377	0.030	0.60	16,000	5,693	0.030	0.60
ø 3	R 0.5	18,000	8,775	0.03	1.20	16,000	6,378	0.045	0.90	11,000	5,695	0.045	0.90
ø 4	R 0.5	16,000	9,750	0.05	1.60	13,000	6,379	0.060	1.20	9,000	5,697	0.060	1.20
〃	R 1.0	14,000	9,263	0.06	1.60	12,000	6,380	0.060	1.20	8,000	5,699	0.060	1.20
ø 5	R 0.5	12,000	11,700	0.08	2.00	11,000	6,381	0.075	1.50	7,300	5,702	0.075	1.50
〃	R 1.0	11,000	10,725	0.08	2.00	9,600	6,382	0.075	1.50	6,400	5,704	0.075	1.50
ø 6	R 0.3	10,900	12,870	0.09	2.40	10,000	6,383	0.090	1.80	6,500	5,706	0.090	1.80
〃	R 0.5	10,600	12,675	0.09	2.40	9,500	6,383	0.090	1.80	6,300	5,708	0.090	1.80
〃	R 1.0	12,654	12,285	0.09	2.40	9,000	6,384	0.090	1.80	5,800	5,710	0.090	1.80
〃	R 1.5	9,000	10,725	0.09	2.40	8,000	6,385	0.090	1.80	5,300	5,713	0.090	1.80
ø 8	R 0.3	8,400	13,163	0.12	3.20	7,300	6,386	0.120	2.40	4,700	5,715	0.120	2.40
〃	R 0.5	8,200	12,675	0.12	3.20	7,100	6,387	0.120	2.40	4,600	5,717	0.120	2.40
〃	R 1.0	8,000	11,700	0.12	3.20	6,700	6,388	0.120	2.40	4,520	5,719	0.120	2.40
〃	R 2.0	7,000	10,725	0.12	3.20	6,000	6,389	0.120	2.40	4,000	5,721	0.120	2.40
ø 10	R 0.3	6,490	12,656	0.15	4.00	5,664	6,390	0.150	3.00	3,776	5,724	0.150	3.00
〃	R 0.5	6,325	12,334	0.15	4.00	5,520	6,391	0.150	3.00	3,680	5,726	0.150	3.00
〃	R 1.0	6,160	12,012	0.15	4.00	5,376	6,392	0.150	3.00	3,584	5,728	0.150	3.00
〃	R 2.0	5,500	10,725	0.15	4.00	4,800	6,393	0.150	3.00	3,200	5,730	0.150	3.00
ø 12	R 0.5	5,428	11,505	0.18	4.80	4,838	6,394	0.180	3.60	3,186	5,732	0.180	3.60
〃	R 1.0	5,290	11,213	0.18	4.80	4,715	6,395	0.180	3.60	3,105	5,734	0.180	3.60
〃	R 2.0	5,152	10,920	0.18	4.80	4,592	6,396	0.180	3.60	3,024	5,737	0.180	3.60
〃	R 3.0	4,600	9,750	0.18	4.80	4,100	6,397	0.180	3.60	2,700	5,739	0.180	3.60
ø 16	R 1.0	4,012	10,124	0.24	6.40	3,540	6,398	0.240	4.80	2,360	5,741	0.240	4.80
〃	R 2.0	3,400	8,580	0.24	6.40	3,000	6,398	0.240	4.80	2,000	5,743	0.240	4.80

절입량 Depth of Cut





경사진면절삭 Inclined Cutting

■ Coefficients respective of tool overhang

Type	Overhang	Revolution	Feed rate	Depth of Cut ap
Straight	L/D ≦ 5	100%	100%	100%
	L/D = 6	90%	80%	80%
	L/D = 7	80%	70%	70%
Taper neck	L/D = 6	100%	100%	100%
	L/D = 8	90%	80%	80%
	L/D ≧ 10	80%	70%	70%

- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 상기 조건표는 4날 기준 입니다.
- 날수에 따라 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 50%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용기계에 따라 조건 변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여 주십시오.
- 유효장 길이가 긴 경우, 위 표와같이 RPM과 FEED를 낮춰주세요.
- 절입 깊이가 얕은 경우, RPM과 FEED를 증가해 주세요.
- 원활한 칩배출을 위하여 에어브로우나 오일 미스트를 추천 합니다.

- For curved milling, raise up the feed up to 30% in stable condition.
- The parameters on the table are based on 4 flutes.
- With 6 flutes milling, raise up the feed up to 50% in stable condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If your CNC machine cannot run enough RPM and Feed, reduce the RPM and feed in same proportion.
- In case of long effective length, reduce the RPM and feed by 30% or less.
- If you use small value of Ap, raise up the RPM and feed.
- Air blow or oil mist is recommended for smooth chip emission.

SJJROU Cutting Condition

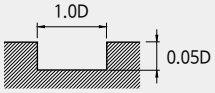
• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

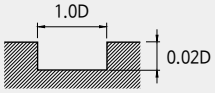
피삭재 Material	공구강 / 금형강 Tool steels / Mold steels				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels				스테인레스강 Stainless Steels				스테인레스강 Stainless Steels			
경도 Hardness	SCM / HPM 30 ~40HRc				NAK80 / KP4M 40~45HRc				SUS304 / SUS316				SUS630 / SUS631			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae 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
ø 6	5,940	970	0.3	6.0	4,950	500	0.3	6.0	4,050	390	0.12	6.0	3,105	280	0.12	6.0
ø 8	4,410	1,110	0.4	8.0	3,762	620	0.4	8.0	3,042	495	0.16	8.0	2,322	315	0.16	8.0
ø 10	3,582	1,025	0.5	10.0	2,970	620	0.5	10.0	2,430	460	0.20	10.0	1,863	300	0.20	10.0
ø 12	2,979	1,000	0.6	12.0	2,502	520	0.6	12.0	2,025	460	0.24	12.0	1,548	300	0.24	12.0
ø 16	2,250	835	0.8	16.0	1,881	430	0.8	16.0	1,521	325	0.32	16.0	1,170	260	0.32	16.0
ø 20	1,791	720	1.0	20.0	1,503	400	1.0	20.0	1,215	325	0.40	20.0	927	225	0.40	20.0

절입량 Depth of Cut

일반강 General Steel



SUS

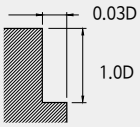


측면절삭 Side Cutting

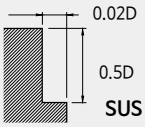
피삭재 Material	공구강 / 금형강 Tool steels / Mold steels				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels				스테인레스강 Stainless Steels				스테인레스강 Stainless Steels			
경도 Hardness	SCM / HPM 30 ~40HRc				NAK80 / KP4M 40~45HRc				SUS304 / SUS316				SUS630 / SUS631			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae 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
ø 6	6,600	745	6	0.18	5,500	450	6	0.18	4,500	300	3	0.12	3,450	250	3	0.1
ø 8	4,900	850	8	0.25	4,180	550	8	0.25	3,380	380	4	0.16	2,580	280	4	0.2
ø 10	3,980	785	10	0.3	3,300	550	10	0.3	2,700	350	5	0.2	2,070	260	5	0.2
ø 12	3,310	765	12	0.36	2,780	460	12	0.36	2,250	350	6	0.24	1,720	270	6	0.2
ø 16	1,990	640	16	0.48	2,090	380	16	0.48	1,690	250	8	0.32	1,300	230	8	0.3
ø 20	2,500	550	20	0.6	1,670	350	20	0.6	1,350	250	10	0.4	1,030	200	10	0.4

절입량 Depth of Cut

일반강 General Steel



SUS



- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할 시 조건표에 회전속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공 시 수용성 절삭유가 가장 효과적 입니다.

- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigdity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

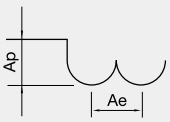
2HRB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		동 Copper C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
반경 Radius	유효장 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	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R0.05	0.3	50,000	85	0.004	0.004	45,000	70	0.004	0.004	45,000	50	0.002	0.002	45,000	40	0.002	0.002
〃	0.5	50,000	75	0.004	0.004	45,000	60	0.002	0.002	45,000	30	0.002	0.002	45,000	30	0.002	0.002
R0.1	0.5	50,000	492	0.010	0.010	45,000	396	0.006	0.007	45,000	260	0.006	0.006	45,000	220	0.005	0.006
〃	1	50,000	432	0.007	0.008	45,000	372	0.004	0.005	45,000	276	0.004	0.004	45,000	200	0.004	0.004
〃	1.5	50,000	360	0.006	0.006	42,000	276	0.003	0.004	42,000	216	0.003	0.004	42,000	180	0.003	0.003
R0.15	1	50,000	744	0.012	0.013	45,000	552	0.010	0.010	38,000	420	0.009	0.010	38,000	348	0.007	0.009
〃	3	48,000	528	0.008	0.009	40,800	360	0.006	0.007	33,600	264	0.005	0.005	33,600	216	0.004	0.005
〃	5	39,600	336	0.004	0.005	28,800	216	0.003	0.003	24,000	168	0.003	0.003	21,600	120	0.002	0.002
R0.2	1	61,200	1,020	0.021	0.034	54,000	768	0.016	0.022	39,600	516	0.013	0.022	39,600	432	0.011	0.021
〃	3	55,200	768	0.015	0.016	44,400	480	0.010	0.010	32,400	312	0.009	0.010	32,400	264	0.008	0.010
〃	5	39,600	468	0.008	0.016	30,000	372	0.008	0.010	26,400	288	0.006	0.010	26,400	228	0.004	0.005
R0.25	1	63,600	1,560	0.026	0.047	45,600	960	0.020	0.033	33,600	636	0.014	0.032	33,600	312	0.007	0.020
〃	5	52,800	1,032	0.012	0.014	34,800	552	0.008	0.008	31,200	444	0.007	0.010	31,200	216	0.006	0.009
〃	10	38,400	528	0.008	0.016	28,800	456	0.007	0.010	28,800	372	0.005	0.010	27,600	216	0.005	0.009
R0.3	1	63,600	1,956	0.030	0.140	39,600	960	0.022	0.091	27,600	600	0.019	0.091	26,400	516	0.014	0.091
〃	5	50,400	1,104	0.014	0.068	28,800	504	0.012	0.043	26,400	396	0.008	0.042	26,400	336	0.007	0.040
〃	10	31,200	540	0.006	0.032	24,000	360	0.005	0.020	22,800	312	0.004	0.020	22,800	240	0.003	0.018
R0.4	2	61,200	2,280	0.054	0.160	34,800	816	0.045	0.100	27,600	552	0.038	0.100	26,400	456	0.030	0.100
〃	6	51,600	1,452	0.035	0.100	28,800	636	0.028	0.068	21,600	420	0.020	0.068	21,600	348	0.015	0.065
〃	10	31,000	630	0.022	0.080	23,400	468	0.020	0.050	17,300	408	0.015	0.050	16,800	336	0.010	0.050
R0.5	2	50,400	2,160	0.068	0.320	33,600	900	0.052	0.220	21,600	540	0.040	0.220	18,000	540	0.008	0.140
〃	5	50,400	2,160	0.068	0.320	33,600	900	0.052	0.220	21,600	540	0.040	0.220	18,000	540	0.008	0.140
〃	10	30,000	1,164	0.024	0.086	16,320	600	0.020	0.056	15,000	456	0.014	0.056	13,680	312	0.008	0.050
〃	16	17,640	720	0.018	0.086	13,680	480	0.016	0.056	12,360	384	0.012	0.056	11,520	252	0.005	0.030
R0.75	3	31,200	2,400	0.167	0.320	21,600	1,152	0.120	0.210	12,960	672	0.100	0.210	12,000	600	0.090	0.210
〃	10	26,400	1,680	0.100	0.220	14,760	780	0.080	0.170	9,720	480	0.062	0.170	9,720	456	0.050	0.160
〃	18	12,120	624	0.030	0.160	12,120	504	0.022	0.110	9,600	432	0.020	0.110	9,600	408	0.012	0.110
〃	30	9,840	516	0.014	0.080	9,840	456	0.012	0.050	9,480	420	0.010	0.050	9,480	396	0.010	0.050
R1	4	26,400	2,448	0.220	0.520	21,000	1,392	0.180	0.350	14,640	1,080	0.140	0.350	14,640	900	0.120	0.350
〃	10	26,400	2,256	0.180	0.350	21,000	1,224	0.140	0.230	14,640	972	0.110	0.230	14,640	792	0.090	0.230
〃	20	15,960	1,164	0.090	0.165	15,960	600	0.060	0.110	12,720	600	0.055	0.110	12,720	492	0.035	0.110
〃	30	10,200	636	0.025	0.070	10,200	480	0.020	0.050	10,200	480	0.015	0.050	10,200	384	0.015	0.045
R1.5	6	16,800	3,240	0.250	0.500	14,400	1,824	0.200	0.340	9,840	1,320	0.160	0.320	6,480	732	0.160	0.320
〃	10	16,800	3,240	0.250	0.500	14,400	1,824	0.200	0.340	9,840	1,320	0.160	0.320	6,480	732	0.160	0.300
〃	20	14,040	2,244	0.200	0.450	12,360	1,476	0.145	0.320	8,520	1,128	0.120	0.310	5,760	660	0.080	0.300
〃	30	10,920	1,620	0.120	0.220	9,360	816	0.100	0.150	8,520	816	0.080	0.150	5,760	384	0.070	0.300
R2	8	12,600	3,012	0.350	0.850	10,440	1,752	0.290	0.550	7,200	1,332	0.220	0.500	7,200	1,056	0.150	0.500
〃	20	12,600	3,012	0.350	0.850	10,440	1,752	0.290	0.550	7,200	1,332	0.220	0.500	7,200	1,056	0.150	0.500
〃	30	11,160	2,040	0.250	0.500	8,880	1,380	0.200	0.320	6,600	1,056	0.150	0.300	6,600	816	0.130	0.300
〃	40	8,160	1,464	0.150	0.500	7,200	1,056	0.132	0.320	6,600	1,056	0.100	0.300	6,600	816	0.090	0.300
R2.5	15	10,800	2,880	0.380	0.800	8,400	1,500	0.300	0.700	6,000	1,140	0.220	0.700	6,000	900	0.200	0.650
〃	25	10,800	2,400	0.380	0.800	8,400	1,380	0.300	0.550	6,000	1,080	0.220	0.550	6,000	816	0.200	0.500
〃	40	9,360	1,320	0.250	0.800	6,720	840	0.200	0.550	4,920	660	0.150	0.550	4,920	504	0.130	0.500
R3	15	8,400	2,676	0.500	1.000	8,160	1,764	0.420	0.800	5,760	1,320	0.300	0.800	4,440	864	0.300	0.800
〃	30	8,400	1,812	0.380	0.900	7,200	1,680	0.300	0.650	5,040	1,176	0.220	0.650	4,440	792	0.220	0.600
R4	25	8,160	1,764	0.410	1.000	7,200	1,176	0.350	0.750	4,920	912	0.180	0.600	4,560	732	0.200	0.630
〃	30	7,680	1,680	0.380	1.000	6,960	1,128	0.300	0.750	4,800	864	0.160	0.600	4,320	720	0.200	0.600
R5	30	6,240	1,344	0.560	1.200	5,880	1,128	0.370	0.900	4,800	852	0.200	0.670	4,200	708	0.200	0.650
〃	35	6,000	1,296	0.500	1.000	5,400	1,080	0.350	0.850	4,560	816	0.150	0.600	3,840	648	0.200	0.600
R6	30	5,160	1,104	0.650	1.400	4,800	984	0.420	0.900	4,320	828	0.250	0.600	3,600	600	0.250	0.600
〃	40	4,920	1,080	0.600	1.200	4,560	960	0.400	0.850	4,080	780	0.200	0.600	3,600	600	0.200	0.600

절입량 Depth of Cut

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



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- 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㎛).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.

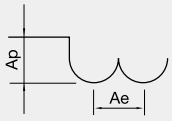
2PHCB/2HSB/2HCB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		동 Copper C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
반경 Radius	날장 Cutting 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	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R0.05	0.2	40,000	300	0.005	0.040	40,000	300	0.004	0.004	30,000	200	0.004	0.040	Cutting is not possible.			
R0.1	0.2	54,000	430	0.020	0.060	54,000	630	0.016	0.012	44,300	450	0.023	0.008	30,000	300	0.012	0.008
〃	0.4	54,000	430	0.020	0.051	54,000	430	0.016	0.040	44,300	345	0.010	0.023	32,800	260	0.007	0.008
R0.15	0.3	54,000	720	0.030	0.090	54,000	750	0.024	0.072	44,300	600	0.015	0.042	32,800	450	0.020	0.013
〃	0.6	54,000	720	0.030	0.075	54,000	715	0.024	0.060	44,300	575	0.015	0.035	32,800	430	0.012	0.013
R0.2	0.4	54,000	870	0.040	0.120	54,000	1,000	0.032	0.096	44,300	800	0.020	0.056	32,800	600	0.028	0.016
〃	0.8	54,000	870	0.040	0.105	54,000	880	0.032	0.084	44,300	700	0.020	0.049	32,800	525	0.016	0.016
R0.25	0.5	56,000	1,250	0.050	0.150	53,000	1,250	0.040	0.120	43,500	1,000	0.025	0.070	32,200	750	0.035	0.022
〃	1	56,000	1,380	0.050	0.125	50,000	1,000	0.040	0.100	41,350	800	0.025	0.058	30,600	600	0.021	0.022
R0.3	0.6	58,000	1,510	0.060	0.180	52,000	1,380	0.048	0.144	42,650	1,100	0.030	0.084	31,500	825	0.042	0.026
〃	1.2	58,000	1,710	0.060	0.155	48,500	1,020	0.048	0.124	40,500	810	0.030	0.072	30,000	610	0.025	0.026
R0.4	0.8	52,000	1,870	0.080	0.240	48,000	1,500	0.064	0.192	39,500	1,200	0.040	0.112	29,250	900	0.056	0.036
〃	2	52,000	1,970	0.080	0.200	45,000	1,085	0.064	0.160	37,500	870	0.040	0.093	27,800	650	0.033	0.036
R0.5	1	41,000	1,660	0.100	0.300	38,540	1,560	0.080	0.240	36,900	1,250	0.050	0.140	27,300	940	0.063	0.040
〃	2.5	41,000	1,880	0.100	0.200	38,540	1,000	0.080	0.160	31,500	800	0.050	0.090	23,000	600	0.022	0.040
R0.6	3	34,000	2,120	0.120	0.360	31,960	1,550	0.096	0.288	32,800	1,250	0.060	0.168	24,400	940	0.072	0.051
R0.75	1.5	27,000	2,280	0.150	0.450	25,380	1,600	0.120	0.360	28,700	1,280	0.075	0.210	21,500	960	0.087	0.068
〃	4	27,000	1,830	0.150	0.325	25,380	1,000	0.120	0.260	26,000	800	0.075	0.152	19,250	600	0.052	0.068
R1	2	32,700	3,560	0.200	0.600	30,738	1,850	0.160	0.480	24,600	1,480	0.100	0.280	18,250	1,110	0.112	0.089
〃	5	32,700	2,980	0.200	0.435	30,738	1,350	0.160	0.348	22,000	1,080	0.100	0.203	16,250	810	0.067	0.089
R1.25	6	30,600	3,680	0.250	0.542	28,764	1,600	0.200	0.430	27,901	1,280	0.125	0.251	15,500	960	0.067	0.115
R1.5	3	26,100	4,400	0.300	0.957	24,534	2,520	0.240	0.766	23,798	2,050	0.150	0.447	15,500	1,530	0.197	0.171
〃	8	26,100	4,110	0.300	0.765	24,534	2,350	0.240	0.612	23,798	1,880	0.150	0.357	15,500	1,410	0.100	0.171
R2	4	18,800	4,160	0.400	1.380	17,672	2,450	0.320	1.100	17,142	1,960	0.200	0.644	12,800	1,470	0.266	0.208
〃	8	18,800	3,920	0.400	1.020	17,672	2,350	0.320	0.816	17,142	1,880	0.200	0.476	12,800	1,410	0.134	0.208
R2.5	5	17,300	3,980	0.500	1.660	16,262	2,560	0.400	1.330	15,774	2,050	0.250	0.770	11,000	1,530	0.215	0.240
〃	10	17,300	3,660	0.500	1.275	16,262	2,300	0.400	1.020	15,774	1,840	0.250	0.595	11,000	1,380	0.180	0.240
R3	6	16,500	3,880	0.600	2.340	15,510	2,700	0.480	1.870	15,045	2,160	0.300	1.090	9,600	1,620	0.290	0.281
〃	12	16,500	3,500	0.600	1.530	15,510	2,400	0.480	1.225	15,045	1,920	0.300	0.715	9,600	1,440	0.230	0.281
R4	8	11,660	4,000	0.800	3.100	10,960	2,300	0.640	2.480	10,632	1,840	0.400	1.446	7,600	1,380	0.400	0.175
〃	14	11,660	3,850	0.800	2.050	10,960	2,000	0.640	1.640	10,632	1,600	0.400	0.957	7,600	1,200	0.400	0.175
R5	10	9,560	4,100	1.000	3.750	8,986	2,200	0.800	3.000	8,717	1,780	0.500	1.750	6,400	1,340	0.500	0.154
〃	18	9,560	3,720	1.000	2.550	8,986	1,700	0.800	2.040	8,717	1,360	0.500	1.190	6,400	1,020	0.500	0.154
R6	12	7,100	4,000	1.200	4.420	6,674	1,850	0.960	3.540	6,474	1,480	0.600	2.060	5,450	1,110	0.600	0.159
〃	22	7,100	3,250	1.200	3.050	6,674	1,600	0.960	2,440	6,474	1,280	0.600	1.423	5,450	960	0.600	0.159
R8	30	4,650	2,000	1.120	3.870	4,371	1,630	0.790	2,350	4,240	1,100	0.500	1.742	4,000	810	0.450	1.150
R10	38	3,200	2,200	1.100	4.120	3,008	1,450	0.840	2,530	2,918	1,100	0.520	1.866	3,100	800	0.400	1.000

절입량 Depth of Cut

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



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- 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㎛).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.

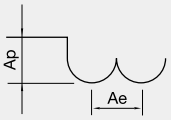
3HCB/4HSB/4HCB

■ 3HCB는 RPM 동일, FEED만 최대 **20% Down** 적용.
■ Use the same RPM, reduce the feed rate up to 20% for 3HCB

피삭재 Material	동 Copper C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness					40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
반경 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	0.100	0.300	38,540	1870	0.080	0.240	36,900	1500	0.050	0.140	27,300	1120	0.040	0.063
R 0.75	27,000	2740	0.150	0.450	25,380	1920	0.120	0.360	28,700	1530	0.075	0.210	21,500	1150	0.068	0.087
R 1	32,700	4200	0.200	0.600	30,738	2220	0.160	0.480	24,600	1770	0.100	0.280	18,250	1330	0.089	0.112
R 1.25	30,600	4400	0.250	0.542	28,764	1920	0.200	0.430	27,901	1540	0.125	0.251	15,500	1150	0.115	0.167
R 1.5	26,100	5280	0.300	0.957	24,534	3020	0.240	0.766	23,798	1820	0.150	0.447	15,500	1840	0.171	0.197
R 2	18,800	4990	0.400	1.380	17,672	2940	0.320	1.100	17,142	1850	0.200	0.644	12,800	1760	0.208	0.215
R 2.5	17,300	4770	0.500	1.660	16,262	3070	0.400	1.330	15,774	1870	0.250	0.770	11,000	1800	0.240	0.266
R 3	16,500	4650	0.600	2.340	15,510	3240	0.480	1.870	15,045	1900	0.300	1.090	9,600	2000	0.281	0.290
R 4	11,660	4800	0.800	3.100	10,960	2760	0.640	2.480	10,632	1820	0.400	1.446	7,600	1650	0.175	0.400
R 5	9,560	4920	1.000	3.750	8,986	2640	0.800	3.000	8,717	1850	0.500	1.750	6,400	1600	0.154	0.500
R 6	7,100	4800	1.200	4.420	6,674	2220	0.960	3.540	6,474	1770	0.600	2.060	5,450	1650	0.159	0.600
R 8	4,650	3900	1.400	4.420	4,371	1950	0.960	3.540	4,240	1760	0.600	2.060	4,000	1670	0.250	1.150
R 10	3,200	3950	1.600	4.420	3,008	1740	0.960	3.540	2,918	1750	0.600	2.060	3,100	1680	0.300	1.000

절입량 Depth of Cut

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



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 상기 조건표는 4날 기준이며, 3날시 회전수는 유지하고, 피드는 안정적인 속도내로 최대 20%까지 DOWN 해주십시오.(3HCB)
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 원활한 칩 배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천 합니다.

- 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㎛).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.

2HRE Cutting Condition

• RPM : rev. / min • Feed : mm/ min

피삭재 Material		구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness		~30HRc				30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 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	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.2	0.5	56,000	340	0.006	0.002	56,000	310	0.005	0.002	56,000	270	0.003	0.016	44,800	180	0.002	0.0118
〃	1	50,900	290	0.005	0.016	50,900	260	0.005	0.016	50,900	230	0.004	0.02	40,800	160	0.003	0.0144
〃	1.5	48,200	250	0.003	0.006	48,200	230	0.003	0.006	48,200	200	0.002	0.006	38,500	140	0.002	0.0054
ø 0.3	1	60,000	560	0.009	0.101	60,000	500	0.008	0.101	60,000	400	0.006	0.101	52,100	330	0.004	0.0909
〃	1.5	50,800	460	0.008	0.057	50,800	410	0.007	0.057	50,800	360	0.005	0.057	42,700	260	0.004	0.0513
〃	2	41,500	350	0.006	0.013	41,500	320	0.005	0.013	41,500	280	0.004	0.013	33,200	190	0.003	0.0117
〃	3	31,900	240	0.002	0.004	31,900	220	0.002	0.004	31,900	190	0.001	0.004	25,500	130	0.001	0.0036
〃	4	26,200	170	0.001	0.003	26,200	160	0.001	0.003	26,200	140	0.001	0.003	20,900	100	0.001	0.0027
〃	5	20,400	100	0.001	0.002	20,400	90	0.001	0.002	20,400	80	0.001	0.002	16,300	60	0.001	0.0018
ø 0.4	1	52,700	660	0.012	0.054	57,700	640	0.010	0.054	48,100	470	0.008	0.054	38,500	320	0.005	0.0486
〃	5	38,500	380	0.003	0.003	34,200	300	0.003	0.003	30,100	240	0.002	0.003	24,100	160	0.001	0.0027
〃	10	33,700	260	0.001	0.001	27,300	190	0.001	0.001	24,600	150	0.001	0.001	19,700	100	0.001	0.0009
ø 0.5	2	56,800	900	0.020	0.098	54,000	760	0.016	0.098	40,600	510	0.014	0.098	32,500	350	0.010	0.0882
〃	3	44,200	660	0.080	0.016	39,900	530	0.090	0.016	32,200	370	0.008	0.016	25,700	260	0.006	0.0144
〃	4	40,600	580	0.009	0.012	36,100	460	0.008	0.012	29,700	330	0.008	0.012	23,700	230	0.005	0.0108
〃	5	37,000	500	0.080	0.008	32,300	390	0.008	0.008	27,200	290	0.006	0.008	21,700	200	0.004	0.0072
〃	6	33,400	420	0.005	0.004	28,500	320	0.005	0.004	24,700	250	0.003	0.004	19,700	170	0.002	0.0036
〃	8	29,100	320	0.002	0.002	24,100	240	0.002	0.002	21,600	190	0.001	0.002	17,400	130	0.001	0.0018
〃	10	26,100	250	0.001	0.001	21,200	180	0.001	0.001	19,600	150	0.001	0.001	15,600	100	0.001	0.0009
〃	14	21,500	120	0.001	0.001	16,700	80	0.001	0.001	16,300	70	0.001	0.001	13,000	50	0.001	0.0009
ø 0.6	2	63,600	1,240	0.025	0.203	53,300	930	0.020	0.203	39,100	600	0.016	0.203	31,300	410	0.011	0.1827
〃	3	52,500	990	0.018	0.114	44,000	740	0.016	0.114	33,500	500	0.013	0.114	26,800	340	0.009	0.1026
〃	4	41,300	740	0.012	0.025	34,700	550	0.011	0.025	27,900	390	0.009	0.025	22,300	270	0.006	0.0225
〃	5	36,700	630	0.010	0.017	30,900	470	0.009	0.017	25,500	340	0.007	0.017	20,400	240	0.005	0.0153
〃	6	32,100	520	0.007	0.008	27,000	390	0.006	0.008	23,000	290	0.005	0.008	18,400	200	0.003	0.0072
〃	8	26,800	390	0.004	0.003	22,600	300	0.004	0.003	20,000	230	0.003	0.003	16,000	160	0.002	0.0027
〃	10	23,400	300	0.002	0.002	19,700	230	0.002	0.002	17,900	180	0.002	0.002	14,300	130	0.001	0.0018
〃	12	20,900	240	0.002	0.001	17,600	180	0.001	0.001	16,400	150	0.001	0.001	13,100	100	0.001	0.0009
〃	16	16,200	100	0.001	0.001	13,700	80	0.001	0.001	13,500	70	0.001	0.001	10,800	50	0.001	0.0009
ø 0.7	2	59,800	1,380	0.030	0.047	50,200	1,040	0.027	0.047	36,100	660	0.021	0.047	28,800	430	0.015	0.0423
〃	4	38,900	840	0.017	0.038	32,700	630	0.015	0.038	25,800	440	0.012	0.038	20,600	290	0.009	0.0342
〃	6	30,200	600	0.010	0.014	25,400	450	0.009	0.014	21,200	330	0.007	0.014	16,900	230	0.005	0.0126
〃	8	25,300	460	0.006	0.006	21,300	350	0.005	0.006	18,400	260	0.004	0.006	14,700	190	0.003	0.0054
〃	10	22,000	360	0.004	0.003	18,500	270	0.003	0.003	16,500	220	0.003	0.003	13,200	160	0.002	0.0027
ø 0.8	2	41,200	1,050	0.033	0.108	34,500	460	0.029	0.108	26,200	530	0.023	0.108	21,000	370	0.016	0.0972
〃	4	37,100	930	0.027	0.08	31,100	700	0.024	0.08	24,100	480	0.019	0.08	19,300	330	0.013	0.072
〃	6	28,800	680	0.015	0.024	24,200	510	0.013	0.024	19,800	370	0.010	0.024	15,800	250	0.007	0.0216
〃	8	24,100	520	0.009	0.01	20,300	390	0.008	0.01	17,200	300	0.006	0.01	13,800	200	0.004	0.009
〃	10	21,000	420	0.006	0.005	17,700	320	0.005	0.005	15,500	240	0.040	0.005	12,400	170	0.003	0.0045
〃	12	18,700	340	0.004	0.003	15,800	260	0.003	0.003	14,100	200	0.003	0.003	11,300	140	0.002	0.0027
〃	14	15,600	230	0.002	0.001	13,200	180	0.020	0.001	12,300	150	0.001	0.001	980	100	0.001	0.0009
ø 0.9	6	27,600	790	0.019	0.019	23,000	590	0.017	0.019	18,500	420	0.013	0.019	14,800	290	0.010	0.0171
〃	8	23,000	600	0.012	0.012	19,300	450	0.011	0.012	16,100	330	0.008	0.012	12,900	230	0.006	0.0108
〃	10	20,000	470	0.008	0.008	16,800	360	0.007	0.008	14,500	270	0.005	0.008	11,600	190	0.004	0.0072
ø 1.0	2	37,900	1,340	0.048	0.263	31,500	990	0.043	0.263	23,400	6,500	0.034	0.263	18,700	440	0.031	0.237
〃	3	37,900	1,340	0.048	0.263	31,500	990	0.043	0.263	23,400	6,500	0.034	0.263	18,700	440	0.031	0.237
〃	4	34,100	1,170	0.040	0.195	28,400	870	0.036	0.195	21,500	580	0.028	0.195	17,200	400	0.025	0.176
〃	5	30,300	1,000	0.032	0.058	25,300	750	0.029	0.058	19,600	510	0.022	0.058	15,700	360	0.020	0.052
〃	6	26,500	850	0.023	0.024	22,100	630	0.021	0.024	17,600	440	0.016	0.024	14,100	310	0.014	0.022
〃	8	22,100	660	0.014	0.013	18,600	490	0.013	0.013	15,300	360	0.010	0.013	12,300	250	0.009	0.012
〃	10	19,200	530	0.010	0.013	16,200	400	0.009	0.013	13,800	300	0.007	0.013	11,000	210	0.006	0.012
〃	12	17,200	440	0.007	0.007	14,500	330	0.006	0.007	12,600	250	0.005	0.007	10,100	170	0.005	0.006
〃	14	15,600	360	0.005	0.005	13,200	270	0.004	0.005	11,700	210	0.003	0.005	9,400	150	0.003	0.005
〃	16	14,300	300	0.004	0.003	12,100	230	0.003	0.003	11,000	180	0.003	0.003	8,800	130	0.003	0.003
〃	20	12,500	200	0.003	0.001	10,600	160	0.003	0.001	9,800	130	0.002	0.001	7,900	90	0.002	0.001
〃	25	10,800	120	0.003	0.001	9,200	90	0.002	0.001	8,800	80	0.002	0.001	7,100	50	0.002	0.001
〃	30	9,700	50	0.002	0.001	8,200	40	0.002	0.001	8,100	30	0.001	0.001	6,500	30	0.001	0.0009
ø 1.2	4	28,900	1,180	0.050	0.189	24,100	870	0.047	0.189	18,300	580	0.036	0.189	14,500	400	0.032	0.170
〃	6	24,800	970	0.037	0.120	20,700	720	0.034	0.120	16,100	490	0.026	0.120	12,800	340	0.023	0.108
〃	8	20,700	760	0.024	0.051	17,300	570	0.021	0.051	13,900	400	0.016	0.051	11,100	280	0.014	0.046
〃	10	18,000	620	0.016	0.026	15,100	470	0.014	0.026	12,400	340	0.011	0.026	9,900	230	0.010	0.023
〃	12	16,100	520	0.011	0.015	13,500	390	0.010	0.015	11,400	290	0.008	0.015	9,100	200	0.007	0.014
〃	16	13,400	380	0.006	0.006	11,300	290	0.005	0.006	9,800	220	0.004	0.006	7,900	150	0.004	0.005
〃	20	11,700	280	0.004	0.003	9,900	210	0.004	0.003	8,800	170	0.003	0.003	7,000	120	0.003	0.003
〃	25	10,800	120	0.003	0.001	9,200	90	0.002	0.001	8,800	80	0.002	0.001	7,100	50	0.002	0.001
〃	30	9,700	50	0.002	0.001	8,200	40	0.002	0.001	8,100	30	0.001	0.001	6,500	30	0.001	0.0009

2HRE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness		~30HRc				30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 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	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 1.4	6	23,300	1,070	0.052	0.222	19,400	800	0.047	0.222	14,800	540	0.060	0.222	11,900	370	0.054	0.200
〃	8	19,500	850	0.035	0.094	16,300	640	0.032	0.094	12,900	440	0.025	0.094	10,300	310	0.023	0.085
〃	10	16,900	710	0.025	0.048	14,200	530	0.022	0.048	11,500	380	0.017	0.048	9,200	260	0.015	0.043
〃	14	13,700	510	0.013	0.018	11,500	390	0.012	0.018	9,700	290	0.009	0.018	7,800	200	0.008	0.016
〃	16	12,600	450	0.010	0.012	10,600	340	0.009	0.012	9,100	250	0.007	0.012	7,300	180	0.006	0.011
〃	20	10,300	300	0.006	0.005	8,700	230	0.005	0.005	7,800	180	0.004	0.005	6,200	120	0.004	0.005
ø 1.5	4	26,600	1,340	0.073	0.462	22,100	1,000	0.065	0.462	16,300	640	0.051	0.462	13,000	440	0.046	0.416
〃	6	22,800	1,120	0.057	0.293	19,000	840	0.051	0.293	14,400	550	0.040	0.293	11,500	380	0.036	0.264
〃	8	19,000	900	0.041	0.124	15,900	670	0.037	0.124	12,500	460	0.029	0.124	10,000	320	0.026	0.112
〃	10	16,600	750	0.030	0.063	13,800	560	0.027	0.063	11,200	390	0.021	0.063	8,900	270	0.019	0.057
〃	12	14,800	630	0.023	0.037	12,400	470	0.020	0.037	10,200	340	0.016	0.037	8,200	240	0.014	0.033
〃	14	13,400	550	0.017	0.023	11,200	410	0.016	0.023	9,500	300	0.012	0.023	7,600	210	0.011	0.021
〃	16	12,300	480	0.013	0.015	10,300	360	0.012	0.015	8,900	270	0.009	0.015	7,100	190	0.008	0.014
〃	18	11,500	420	0.011	0.011	9,600	310	0.010	0.011	8,400	240	0.007	0.011	6,700	170	0.006	0.010
〃	20	10,700	370	0.009	0.008	9,000	280	0.008	0.008	7,900	220	0.006	0.008	6,300	150	0.005	0.007
〃	25	9,300	270	0.005	0.004	7,800	200	0.005	0.004	7,100	160	0.004	0.004	5,700	110	0.004	0.004
〃	30	8,300	200	0.004	0.002	7,000	150	0.004	0.002	6,500	120	0.003	0.002	5,200	90	0.003	0.002
ø 1.6	10	16,100	780	0.035	0.082	13,500	580	0.032	0.082	10,800	410	0.025	0.082	8,600	280	0.018	0.074
〃	14	13,000	580	0.020	0.030	10,900	430	0.018	0.030	9,100	320	0.014	0.030	7,300	220	0.010	0.027
〃	18	11,100	450	0.013	0.014	9,300	340	0.012	0.014	8,000	260	0.009	0.014	6,400	180	0.006	0.013
ø 2	4	23,000	1,500	0.070	0.966	20,000	1,200	0.060	0.966	14,000	750	0.052	0.966	12,000	500	0.040	0.869
〃	6	20,300	1,350	0.064	0.926	17,400	1,030	0.058	0.926	12,500	650	0.045	0.926	10,000	450	0.032	0.833
〃	8	17,000	1,090	0.054	0.391	14,500	830	0.048	0.391	10,800	540	0.038	0.391	8,700	380	0.027	0.352
〃	10	14,800	920	0.045	0.200	12,600	700	0.040	0.200	9,700	470	0.031	0.200	7,800	330	0.022	0.180
〃	12	13,200	790	0.037	0.116	11,200	600	0.034	0.116	8,900	420	0.026	0.116	7,100	290	0.019	0.104
〃	14	12,000	700	0.031	0.073	10,200	530	0.028	0.073	8,200	370	0.022	0.073	6,600	260	0.016	0.066
〃	16	11,100	620	0.026	0.049	9,400	470	0.024	0.049	7,700	340	0.018	0.049	6,100	230	0.013	0.044
〃	18	10,300	550	0.022	0.034	8,700	420	0.020	0.034	7,200	310	0.015	0.034	5,800	210	0.011	0.031
〃	20	9,600	500	0.018	0.025	8,100	380	0.016	0.025	6,900	280	0.013	0.025	5,500	190	0.009	0.023
〃	22	8,700	420	0.014	0.018	7,500	320	0.014	0.018	6,500	250	0.010	0.018	5,200	170	0.008	0.016
〃	25	8,400	390	0.012	0.013	7,100	290	0.011	0.013	6,200	230	0.008	0.013	4,900	160	0.006	0.012
〃	30	7,500	310	0.008	0.007	6,300	230	0.007	0.007	5,600	180	0.005	0.007	4,500	130	0.004	0.006
ø 2.5	8	15,000	1,340	0.077	0.954	12,800	1,020	0.069	0.954	9,600	670	0.054	0.954	7,700	460	0.039	0.859
〃	10	13,100	1,140	0.068	0.488	11,100	860	0.061	0.488	8,600	590	0.048	0.488	6,900	400	0.034	0.439
〃	12	11,800	1,000	0.060	0.283	10,000	750	0.054	0.283	7,900	520	0.042	0.283	6,300	360	0.030	0.255
〃	16	9,900	790	0.045	0.119	8,400	590	0.040	0.119	6,800	430	0.031	0.119	5,500	290	0.022	0.107
〃	20	8,700	650	0.033	0.061	7,300	490	0.030	0.061	6,100	360	0.023	0.061	4,900	250	0.017	0.055
〃	25	7,600	520	0.022	0.031	6,400	390	0.019	0.031	5,500	300	0.015	0.031	4,400	210	0.011	0.028
〃	30	6,800	430	0.014	0.018	5,700	320	0.012	0.018	5,000	250	0.010	0.018	4,000	1,700	0.007	0.016
〃	35	6,200	380	0.009	0.012	5,200	280	0.008	0.012	4,800	190	0.007	0.012	3,800	1,400	0.005	0.011
〃	40	5,700	290	0.005	0.008	4,800	220	0.004	0.008	4,400	170	0.003	0.008	3,500	120	0.002	0.007
〃	50	5,000	190	0.001	0.004	4,200	140	0.001	0.004	3,900	120	0.001	0.004	3,100	80	0.001	0.004
ø 3	6	13,200	1,470	0.103	1.978	10,900	1,080	0.093	1.978	8,000	700	0.072	1.978	6,400	480	0.052	1.780
〃	10	11,600	1,270	0.092	1.013	9,600	930	0.083	1.013	7,200	620	0.064	1.013	5,800	430	0.046	0.912
〃	12	10,500	1,110	0.081	0.586	8,700	830	0.073	0.586	6,700	560	0.057	0.586	5,300	380	0.041	0.527
〃	16	8,900	900	0.064	0.247	7,400	670	0.058	0.247	5,900	470	0.045	0.247	4,700	320	0.032	0.222
〃	20	7,800	750	0.050	0.127	6,600	560	0.045	0.127	5,300	400	0.035	0.127	4,300	280	0.025	0.114
〃	25	6,900	620	0.036	0.065	5,800	460	0.032	0.065	4,800	340	0.025	0.065	3,900	230	0.018	0.059
〃	30	6,200	520	0.026	0.038	5,200	390	0.023	0.038	4,500	290	0.018	0.038	3,600	200	0.013	0.034
〃	35	5,700	440	0.018	0.024	4,800	330	0.016	0.024	4,200	250	0.013	0.024	3,300	170	0.009	0.022
〃	40	5,300	370	0.013	0.016	4,500	280	0.012	0.016	3,900	220	0.009	0.016	3,100	150	0.006	0.014
〃	45	5,000	330	0.008	0.012	4,200	230	0.008	0.012	3,700	180	0.006	0.012	2,900	130	0.005	0.011
〃	50	4,700	270	0.006	0.008	3,900	200	0.005	0.008	3,600	160	0.004	0.008	2,800	110	0.003	0.007
〃	60	4,500	250	0.003	0.005	3,600	180	0.003	0.005	3,200	130	0.003	0.005	2,500	90	0.002	0.005
ø 4	8	10,000	1,600	0.140	1.990	8,800	1,100	0.140	1.990	6,800	770	0.093	1.990	5,300	500	0.070	1.791
〃	10	9,200	1,400	0.120	1.960	8,000	1,000	0.120	1.960	5,900	690	0.085	1.960	4,700	460	0.066	1.764
〃	12	8,500	1,280	0.112	1.852	7,100	950	0.101	1.852	5,100	600	0.078	1.852	4,100	410	0.056	1.667
〃	16	7,200	1,050	0.093	0.781	6,000	770	0.084	0.781	4,400	510	0.065	0.781	3,600	350	0.046	0.703
〃	20	6,300	880	0.077	0.400	5,200	650	0.069	0.400	4,000	440	0.054	0.400	3,200	300	0.038	0.360
〃	25	5,600	750	0.061	0.205	4,600	540	0.055	0.205	3,600	380	0.042	0.205	2,900	260	0.030	0.185
〃	30	5,000	630	0.048	0.119	4,100	460	0.043	0.119	3,300	330	0.033	0.119	2,600	230	0.024	0.107
〃	35	4,600	540	0.038	0.075	3,800	400	0.034	0.075	3,100	290	0.026	0.075	2,500	200	0.019	0.068
〃	40	4,200	470	0.030	0.050	3,500	350	0.027	0.050	2,900	250	0.021	0.050	2,300	180	0.015	0.045
〃	45	3,900	410	0.023	0.035	3,300	300	0.021	0.035	2,700	230	0.016	0.035	2,200	160	0.012	0.032
〃	50	3,700	360	0.018	0.026	3,100	270	0.016	0.026	2,600	200	0.013	0.026	2,100	140	0.009	0.023
〃	55	3,500	320	0.015	0.020	2,950	250	0.015	0.020	2,500	180	0.010	0.020	2,000	130	0.007	0.018
〃	60	3,300	280	0.011	0.015	2,800	210	0.010	0.015	2,400	160	0.008	0.015	1,900	110	0.006	0.014

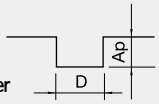
2HRE Cutting Condition

• RPM : rev./min • Feed : mm/min

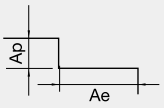
피삭재 Material		구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness		~30HRc				30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 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	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 5	16	6,000	1,140	0.127	1.907	5,100	860	0.114	1.907	3,500	520	0.089	1.907	2,800	360	0.064	1.716
〃	20	5,300	980	0.121	0.977	4,400	730	0.109	0.977	3,100	440	0.085	0.977	2,500	310	0.061	0.879
〃	25	4,600	820	0.109	0.500	3,800	600	0.099	0.500	2,800	390	0.077	0.500	2,200	270	0.055	0.450
〃	30	4,200	710	0.094	0.289	3,400	510	0.085	0.289	2,500	340	0.066	0.289	2,000	230	0.047	0.260
〃	35	3,800	620	0.077	0.182	3,100	450	0.069	0.182	2,300	300	0.054	0.182	1,900	210	0.038	0.164
〃	40	3,500	540	0.060	0.122	2,800	390	0.054	0.122	2,200	270	0.042	0.122	1,700	180	0.030	0.110
〃	50	3,100	430	0.031	0.063	2,400	300	0.028	0.063	1,900	210	0.022	0.063	1,500	150	0.016	0.057
〃	60	2,800	350	0.013	0.036	2,100	240	0.012	0.036	1,800	170	0.009	0.036	1,400	120	0.007	0.032
ø 6	20	4,200	960	0.126	2.025	3,800	780	0.114	2.025	2,600	470	0.088	2.025	2,100	330	0.063	1.823
〃	30	3,400	730	0.109	0.600	2,800	540	0.099	0.600	2,000	340	0.077	0.600	1,600	240	0.055	0.540
〃	40	3,000	600	0.083	0.253	2,300	410	0.074	0.253	1,700	260	0.058	0.253	1,300	170	0.041	0.228
〃	50	2,600	480	0.054	0.130	1,900	310	0.049	0.130	1,500	220	0.038	0.130	1,200	160	0.027	0.117
〃	60	2,400	410	0.031	0.075	1,700	260	0.028	0.075	1,300	170	0.022	0.075	1,000	120	0.016	0.068
ø 8	20	3,200	910	0.180	1.600	2,800	710	0.160	1.600	2,300	450	0.130	1.600	1,700	330	0.090	1.440
〃	40	2,600	600	0.120	0.200	2,000	410	0.100	0.200	1,500	250	0.080	0.200	1,100	160	0.060	0.180
ø 10	25	2,900	890	0.200	1.760	2,700	680	0.180	1.760	2,100	430	0.130	1.760	1,500	310	0.080	1.584
〃	45	2,200	580	0.140	0.240	2,000	400	0.120	0.240	1,300	220	0.700	0.240	900	150	0.050	0.216

절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth



- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC60 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø10이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

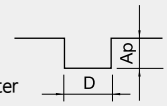
4HRE Cutting Condition

• RPM : rev./min • Feed : mm/min

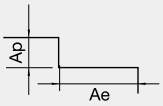
피삭재 Material		구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness		~30HRc				30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 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	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.8	8	25,000	750	0.009	0.01	21,600	560	0.008	0.01	18,300	450	0.006	0.01	15,900	300	0.004	0.009
〃	16	16,800	340	0.002	0.001	15,700	270	0.002	0.001	13,300	240	0.001	0.001	10,400	200	0.001	0.001
ø 1	8	24,000	720	0.014	0.024	20,300	490	0.013	0.024	16,900	390	0.010	0.024	14,200	265	0.007	0.022
〃	16	15,800	325	0.004	0.003	14,300	250	0.003	0.003	12,200	220	0.003	0.003	9,200	178	0.002	0.003
〃	25	12,600	165	0.003	0.001	11,200	120	0.002	0.001	10,800	105	0.002	0.001	8,300	88	0.001	0.001
ø 1.5	8	21,000	980	0.041	0.124	18,800	740	0.037	0.124	14,600	520	0.029	0.124	12,400	355	0.020	0.112
〃	16	13,600	544	0.013	0.015	12,200	410	0.012	0.015	10,500	322	0.009	0.015	8,000	230	0.007	0.014
〃	25	11,400	318	0.005	0.004	10,500	240	0.005	0.004	8,600	196	0.004	0.004	6,200	138	0.003	0.004
ø 2	8	19,600	1,197	0.054	0.391	17,000	970	0.048	0.391	12,800	630	0.038	0.391	10,600	470	0.027	0.352
〃	16	12,300	740	0.026	0.049	11,600	574	0.024	0.049	9,800	378	0.018	0.049	7,300	268	0.013	0.044
〃	25	10,100	456	0.012	0.013	9,700	348	0.011	0.013	7,900	262	0.008	0.013	6,400	184	0.006	0.012
ø 2.5	10	16,600	1,240	0.068	0.488	14,300	1,035	0.061	0.488	10,200	689	0.048	0.488	8,350	510	0.034	0.439
〃	16	11,600	890	0.045	0.119	9,800	710	0.040	0.119	7,220	480	0.031	0.119	6,700	326	0.022	0.107
〃	25	8,700	630	0.022	0.031	8,300	460	0.019	0.031	6,360	338	0.015	0.031	5,500	273	0.011	0.028
ø 3	8	14,800	1,390	0.092	0.350	12,100	1,100	0.083	0.350	8,800	736	0.064	0.350	6,900	553	0.046	0.315
〃	16	10,200	968	0.064	0.247	8,600	816	0.058	0.247	6,300	543	0.045	0.247	5,890	362	0.032	0.222
〃	25	7,600	740	0.036	0.038	7,100	518	0.032	0.038	5,880	397	0.025	0.038	3,900	293	0.018	0.034
〃	35	6,200	415	0.018	0.024	5,300	374	0.016	0.024	4,730	322	0.013	0.024	3,300	216	0.009	0.022
ø 4	8	12,300	1,830	0.140	0.950	10,200	1,210	0.140	0.950	7,400	848	0.093	0.900	6,300	500	0.070	0.810
〃	16	8,600	1,240	0.093	0.580	7,200	860	0.084	0.580	5,100	573	0.065	0.580	5,150	397	0.046	0.522
〃	25	6,400	890	0.061	0.205	5,000	590	0.055	0.205	4,180	433	0.042	0.205	3,180	304	0.030	0.185
〃	40	4,950	510	0.030	0.050	3,900	385	0.027	0.050	3,300	341	0.021	0.050	2,770	208	0.015	0.045
ø 5	16	7,200	1,280	0.127	1.250	6,400	944	0.114	1.250	4,387	554	0.089	1.250	4,220	378	0.064	1.125
〃	25	5,400	955	0.109	0.500	4,600	665	0.099	0.500	3,668	412	0.077	0.500	2,740	280	0.055	0.450
〃	40	4,100	660	0.060	0.122	3,300	470	0.054	0.122	3,655	298	0.042	0.122	2,320	180	0.030	0.110
ø 6	20	4,880	1,088	0.126	2.025	4,433	726	0.114	2.025	2,980	528	0.088	2.025	2,640	356	0.063	1.823
〃	40	3,800	720	0.083	0.253	2,950	497	0.074	0.253	2,100	326	0.058	0.253	2,078	226	0.041	0.228
ø 8	20	4,460	980	0.180	1.600	3,600	787	0.160	1.600	2,540	487	0.130	1.600	2,430	343	0.090	1.440
〃	40	3,400	780	0.120	0.200	2,460	516	0.100	0.200	1,890	297	0.080	0.200	1,770	211	0.060	0.180
ø 10	25	3,400	926	0.200	1.760	3,160	726	0.180	1.760	2,360	467	0.130	1.760	1,650	326	0.080	1.584
〃	35	2,170	640	0.140	0.240	2,120	615	0.120	0.240	1,780	412	0.090	0.240	1,180	192	0.070	0.216
ø 12	30	2,500	710	0.220	1.840	2,300	580	0.200	1.840	2,000	400	0.140	1.840	1,400	280	0.080	1.656
〃	40	1,880	526	0.120	0.280	1,820	474	0.110	0.280	1,690	345	0.080	0.280	1,020	184	0.060	0.252

절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth



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- HRC60 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

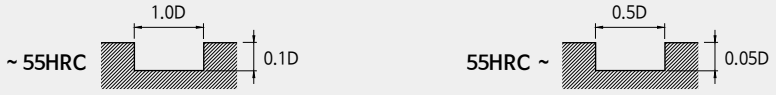
2HSE/2HCE Cutting Condition

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		고경도강 Hardened Steels STAVAX / SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness	30 ~ 40HRc		40 ~ 45HRc		45 ~ 55HRc		55 ~ 62HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø0.1	50,000	150	45,000	150	40,000	135	33,000	75
Ø0.2	50,000	195	45,000	173	40,000	143	33,000	90
Ø0.3	50,000	285	45,000	210	40,000	173	33,000	105
Ø0.4	50,000	353	45,000	270	40,000	210	33,000	135
Ø0.5	50,000	555	45,000	420	40,000	330	33,000	210
Ø0.6	50,000	705	45,000	540	40,000	428	30,000	240
Ø0.8	50,000	900	40,000	660	30,000	443	25,000	278
Ø0.9	49,000	983	39,000	780	27,800	495	22,700	308
Ø1	48,000	1,125	38,000	855	25,500	540	20,500	323
Ø2	33,300	1,275	26,000	1,020	17,500	630	14,500	390
Ø3	21,800	1,275	17,300	1,020	11,500	630	9,500	390
Ø4	16,700	1,320	13,200	1,050	8,800	660	7,200	405
Ø5	15,700	1,500	12,500	1,208	8,300	750	6,400	428
Ø6	13,100	1,425	10,350	1,155	6,900	720	5,300	420
Ø8	9,880	1,395	7,800	1,080	5,200	668	4,000	383
Ø10	7,800	1,275	6,150	1,020	4,100	623	3,200	360
Ø12	6,650	1,275	5,250	1,020	3,500	623	2,650	360
Ø16	5,540	1,170	4,340	915	2,600	540	1,840	270
Ø18	5,540	1,170	4,340	915	2,600	540	1,840	270
Ø20	4,640	1,080	4,340	855	2,100	450	1,460	270

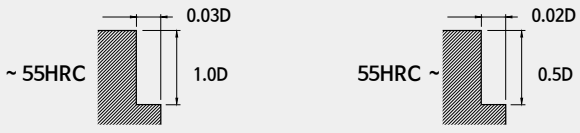
절입량 Depth of Cut



측면절삭 Side Cutting

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		고경도강 Hardened Steels STAVAX / SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness	30 ~ 40HRc		40 ~ 45HRc		45 ~ 55HRc		55 ~ 62HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø1	48,000	788	38,000	615	25,500	383	20,500	233
Ø2	33,300	900	26,000	728	17,500	450	14,500	278
Ø3	21,800	900	17,300	728	11,500	450	9,500	278
Ø4	16,700	938	13,200	750	8,800	469	7,200	289
Ø5	15,700	1088	12,500	863	8,300	533	6,400	308
Ø6	13,100	1013	10,350	825	6,900	518	5,300	300
Ø8	9,880	990	7,800	773	5,200	476	4,000	274
Ø10	7,800	900	6,150	728	4,100	443	3,200	255
Ø12	6,650	900	5,250	728	3,500	443	2,650	255
Ø16	5,540	750	4,340	660	2,600	398	1,840	255
Ø18	5,540	750	4,200	660	2,450	398	1,650	225
Ø20	4,640	713	3,650	600	2,100	375	1,460	221

절입량 Depth of Cut



- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC60 이상 고경도강 가공 시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
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- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4HSE/4HCE Cutting Condition

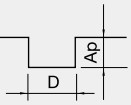
• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM/HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	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
ø 0.3	50,000	238	0.03	0.3	45,000	175	0.03	0.3	40,000	144	0.02	0.150	33,000	88	0.01	0.075
ø 0.4	50,000	294	0.04	0.4	45,000	225	0.04	0.4	40,000	175	0.02	0.200	33,000	113	0.01	0.100
ø 0.5	50,000	463	0.05	0.5	45,000	350	0.05	0.5	40,000	275	0.03	0.250	33,000	175	0.01	0.125
ø 0.6	50,000	588	0.06	0.6	45,000	450	0.06	0.6	40,000	356	0.03	0.300	30,000	200	0.02	0.150
ø 0.8	50,000	750	0.08	0.8	40,000	550	0.08	0.8	30,000	369	0.04	0.400	25,000	231	0.02	0.200
ø 0.9	49,000	819	0.09	0.9	39,000	650	0.09	0.9	27,800	413	0.05	0.450	22,700	256	0.02	0.225
ø 1	48,000	1,313	0.1	1.0	38,000	855	0.1	1.0	25,500	538	0.05	0.500	20,500	325	0.03	0.250
ø 2	33,300	1,488	0.2	2.0	26,000	1,020	0.2	2.0	17,500	625	0.10	1.000	14,500	388	0.05	0.500
ø 3	21,800	1,488	0.3	3.0	17,300	1,020	0.3	3.0	11,500	625	0.15	1.500	9,500	388	0.08	0.750
ø 4	16,700	1,540	0.4	4.0	13,200	1,050	0.4	4.0	8,800	663	0.20	2.000	7,200	406	0.10	1.000
ø 5	15,700	1,750	0.5	5.0	12,500	1,208	0.5	5.0	8,300	750	0.25	2.500	6,400	425	0.13	1.250
ø 6	13,100	1,663	0.6	6.0	10,350	1,155	0.6	6.0	6,900	719	0.30	3.000	5,300	419	0.15	1.500
ø 8	9,880	1,625	0.8	8.0	7,800	1,080	0.8	8.0	5,200	669	0.40	4.000	4,000	375	0.20	2.000
ø 10	7,800	1,488	1.0	10.0	6,150	1,020	1.0	10.0	4,100	625	0.50	5.000	3,200	363	0.25	2.500
ø 12	6,650	1,488	1.2	12.0	5,250	1,020	1.2	12.0	3,500	625	0.60	6.000	2,650	363	0.30	3.000
ø 16	5,540	1,363	1.6	16.0	4,340	915	1.6	16.0	2,600	538	0.80	8.000	1,840	269	0.40	4.000
ø 18	5,540	1,363	1.8	18.0	4,340	913	1.8	18.0	2,600	538	0.90	9.000	1,840	269	0.45	4.500
ø 20	4,640	1,260	2.0	20.0	4,340	912	2.0	20.0	2,600	538	1.00	10.000	1,840	269	0.50	5.000

절입량 Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter

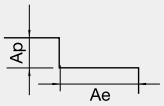


측면절삭 Side Cutting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM/HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness	30 ~ 40HRc				40 ~ 50HRc				45 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	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
ø 0.3	50,000	214	0.3	0.009	45,000	158	0.3	0.009	40,000	129	0.15	0.006	33,000	79	0.08	0.003
ø 0.4	50,000	264	0.4	0.012	45,000	203	0.4	0.012	40,000	158	0.20	0.008	33,000	101	0.10	0.004
ø 0.5	50,000	416	0.5	0.015	45,000	315	0.5	0.015	40,000	248	0.25	0.010	33,000	158	0.13	0.005
ø 0.6	50,000	529	0.6	0.018	45,000	405	0.6	0.018	40,000	321	0.30	0.012	30,000	180	0.15	0.006
ø 0.8	50,000	675	0.8	0.024	40,000	495	0.8	0.024	30,000	332	0.40	0.016	25,000	208	0.20	0.008
ø 0.9	49,000	737	0.9	0.027	39,000	585	0.9	0.027	27,800	371	0.45	0.018	22,700	231	0.23	0.009
ø 1	48,000	1,181	1.0	0.030	38,000	770	1.0	0.030	25,500	484	0.50	0.020	20,500	293	0.25	0.010
ø 2	33,300	1,339	2.0	0.060	26,000	918	2.0	0.060	17,500	563	1.00	0.040	14,500	349	0.50	0.020
ø 3	21,800	1,339	3.0	0.090	17,300	918	3.0	0.090	11,500	563	1.50	0.060	9,500	349	0.75	0.030
ø 4	16,700	1,386	4.0	0.120	13,200	945	4.0	0.120	8,800	596	2.00	0.080	7,200	366	1.00	0.040
ø 5	15,700	1,575	5.0	0.150	12,500	1,087	5.0	0.150	8,300	675	2.50	0.100	6,400	383	1.25	0.050
ø 6	13,100	1,496	6.0	0.180	10,350	1,040	6.0	0.180	6,900	647	3.00	0.120	5,300	377	1.50	0.060
ø 8	9,880	1,463	8.0	0.240	7,800	972	8.0	0.240	5,200	602	4.00	0.160	4,000	338	2.00	0.080
ø 10	7,800	1,339	10.0	0.300	6,150	918	10.0	0.300	4,100	563	5.00	0.200	3,200	326	2.50	0.100
ø 12	6,650	1,339	12.0	0.360	5,250	918	12.0	0.360	3,500	563	6.00	0.240	2,650	326	3.00	0.120
ø 16	5,540	1,226	16.0	0.480	4,340	824	16.0	0.480	2,600	484	8.00	0.320	1,840	242	4.00	0.160
ø 18	5,540	1,226	18.0	0.540	4,340	821	18.0	0.540	2,600	484	9.00	0.360	1,840	242	4.50	0.180
ø 20	4,640	1,134	20.0	0.600	4,340	821	20.0	0.600	2,600	484	10.00	0.400	1,840	242	5.00	0.200

절입량 Depth of Cut

Side Milling
• Ap : Axial Depth
• Ae : Radial Depth



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2LEM/4LEM

■ 4LEM은 RPM 동일, FEED만 최대 50% Up 적용.
■ Use the same RPM and raise up the feed up to 50% for 4LEM.

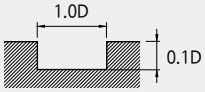
• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

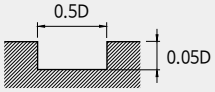
피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM / HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		고경도강 Hardened Steels STAVAX / SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness	30 ~ 40HRc		40 ~ 45HRc		45 ~ 55HRc		55 ~ 62HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø1	40,000	293	40,000	264	40,000	237	40,000	71
Ø1.5	35,000	320	35,000	288	35,000	259	32,000	78
Ø2	32,000	330	24,000	297	15,000	267	17,500	80
Ø3	21,000	340	17,000	306	10,500	275	13,000	83
Ø4	17,000	460	13,500	414	8,500	373	8,000	112
Ø5	14,500	520	11,500	468	7,500	421	6,750	126
Ø6	12,500	550	10,000	495	6,500	446	5,500	134
Ø8	9,500	630	7,500	567	5,000	510	4,500	153
Ø10	8,000	829	6,500	721	4,000	577	3,550	173
Ø12	6,500	761	5,500	662	3,350	529	3,000	159
Ø16	5,000	761	4,100	662	2,500	529	2,250	159
Ø20	4,000	702	3,250	611	2,000	489	1,800	147
Ø25	3,250	630	2,600	548	1,600	438	1,400	132

절입량 Depth of Cut

~ 50HRC



50HRC ~

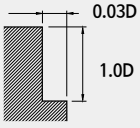


측면절삭 Side Cutting

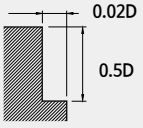
피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM / HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		고경도강 Hardened Steels STAVAX / SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness	30 ~ 40HRc		40 ~ 45HRc		45 ~ 55HRc		55 ~ 62HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø1	40,000	337	40,000	286	40,000	229	40,000	195
Ø1.5	35,000	368	35,000	313	35,000	250	35,000	213
Ø2	32,000	380	24,000	323	15,000	258	17,500	219
Ø3	21,000	391	17,000	332	10,500	266	13,000	226
Ø4	17,000	529	13,500	450	8.500	360	8,000	306
Ø5	14,500	598	11,500	508	7,500	407	6,750	346
Ø6	12,500	633	10,000	538	6.500	430	5,500	366
Ø8	9,500	725	7,500	616	5,000	493	4,500	419
Ø10	8,000	765	6,500	650	4,000	520	3,550	442
Ø12	6,500	638	5,500	542	3,350	434	3,000	368
Ø16	5,000	638	4,100	542	2,500	434	2,250	368
Ø20	4,000	606	3,250	515	2,000	412	1,800	350
Ø25	3,250	570	2,600	485	1,600	388	1,400	329

절입량 Depth of Cut

~ 50HRC



50HRC ~



- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 조건표는 2날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 50% 까지 UP 해주십시오.
- HRC55 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다(Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일미스트쿨런트를추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

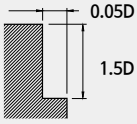
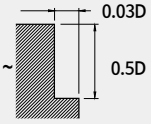
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- The parameters on the table is based on 2 flutes. For using 4 flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- When milling workpiece, HRC over 60 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4HEM/6&8HEM

■ 6&8EM은 RPM 동일, FEED만 최대 **50% Up** 적용.
■ Use the same RPM and raise up the feed up to 50% for 6&8HEM.

• RPM : rev./min • Feed : mm/min

측면절삭 Side Cutting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM/HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				50 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	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
ø 1	24,000	149	1.5	0.05	9,600	33	0.5	0.03	19,200	111	1.5	0.05	9,300	28	0.5	0.03
ø 1.5	24,000	186	2.25	0.075	9,600	42	0.75	0.045	19,200	139	2.25	0.075	9,000	36	0.75	0.045
ø 2	24,000	248	3	0.1	9,600	56	1	0.06	19,200	186	3	0.1	8,200	47	1	0.06
ø 3	23,040	564	4.5	0.15	9,216	127	1.5	0.09	18,432	423	4.5	0.15	7,373	108	1.5	0.09
ø 4	17,280	653	6	0.2	6,912	147	2	0.12	13,824	490	6	0.2	5,530	125	2	0.12
ø 5	8,640	743	7.5	0.25	3,456	167	2.5	0.15	6,912	557	7.5	0.25	2,765	142	2.5	0.15
ø 6	6,480	861	9	0.3	2,592	194	3	0.18	5,184	646	9	0.3	2,074	165	3	0.18
ø 8	5,184	861	12	0.4	2,074	194	4	0.24	4,147	646	12	0.4	1,659	165	4	0.24
ø 10	4,320	861	15	0.5	1,728	194	5	0.3	3,456	646	15	0.5	1,382	165	5	0.30
ø 12	3,240	713	18	0.6	1,296	160	6	0.36	2,592	535	18	0.6	1,037	136	6	0.36
ø 16	2,592	535	24	0.8	1,037	120	8	0.48	2,074	401	24	0.8	829	102	8	0.48
ø 20	2,318	431	30	1	927	97	10	0.6	1,854	323	30	1	742	82	10	0.60
ø 25	3,090	386	37.5	1.25	1,236	87	12.5	0.75	2,472	290	37.5	1.25	989	74	12.5	0.75
절입량 Depth of Cut	~ 50HRC 								50HRC ~ 							

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- 상기 조건표는 4날 기준이며 , 6&8날시 회전수는 유지하고 피드는 안정적인 속도 내에서 최대 50%까지 UP 해주십시오.
- HRC62 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 길게 체결할시 회전수와 피드를 같은 비율로 DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일미스트쿨런트를추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- The parameters on the table is based on 4flutes. For using 6 or 8flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- When milling workpiece, HRC over 60 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

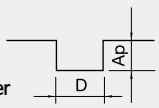
2CRE Cutting Condition

• RPM : rev./min • Feed : mm/min

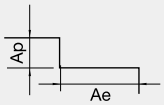
피삭재 Material	동 Copper C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness					40 ~ 45HRC				45 ~ 55HRC				55 ~ 62HRC			
외경 Outside Diameter	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.2	1	50,000	800	0.026	0.020	50,000	263	0.006	0.020	34,500	197	0.004	0.020	14,950	108	0.001	0.015
〃	1.5	50,000	750	0.017	0.010	50,000	210	0.005	0.010	26,450	158	0.003	0.010	11,730	87	0.001	0.007
ø 0.3	1	50,000	800	0.029	0.020	50,000	224	0.007	0.020	34,500	168	0.005	0.015	21,505	92	0.004	0.015
〃	3	50,000	650	0.029	0.015	50,000	182	0.006	0.015	24,150	137	0.003	0.010	14,605	75	0.002	0.010
ø 0.4	1	47,150	800	0.047	0.062	50,000	224	0.013	0.070	39,675	168	0.011	0.070	23,575	92	0.004	0.070
〃	3	33,350	700	0.026	0.053	26,450	196	0.008	0.026	26,450	147	0.007	0.026	15,755	81	0.003	0.026
ø 0.5	1	48,300	850	0.079	0.114	48,300	238	0.033	0.119	39,100	179	0.029	0.119	24,150	98	0.013	0.119
〃	3	31,050	750	0.056	0.088	31,050	210	0.022	0.110	25,415	158	0.020	0.110	15,755	87	0.008	0.110
〃	5	25,760	700	0.026	0.044	25,760	196	0.011	0.010	20,700	147	0.010	0.010	12,995	81	0.004	0.010
ø 0.6	2	27,945	850	0.111	0.158	27,945	238	0.010	0.214	23,000	179	0.010	0.214	14,835	98	0.004	0.214
〃	6	16,445	750	0.035	0.044	16,445	210	0.003	0.010	13,570	158	0.003	0.010	8,740	87	0.001	0.010
ø 0.8	4	17,250	900	0.129	0.194	17,020	252	0.014	0.114	14,720	189	0.015	0.114	9,890	104	0.007	0.114
〃	8	12,650	750	0.029	0.098	12,650	210	0.005	0.088	10,695	158	0.005	0.088	7,475	87	0.002	0.088
ø 1	4	13,800	950	0.196	0.396	13,800	266	0.029	0.264	11,730	200	0.029	0.264	8,280	110	0.017	0.264
〃	10	8,625	750	0.047	0.308	8,625	210	0.011	0.123	7,475	158	0.011	0.123	5,290	87	0.006	0.123
〃	16	6,900	650	0.018	0.220	6,900	182	0.004	0.026	5,980	137	0.004	0.026	4,255	75	0.002	0.026
ø 1.2	6	9,200	1,035	0.182	0.457	9,200	575	0.018	0.088	8,165	483	0.018	0.088	6,095	59	0.011	0.088
〃	12	6,670	662	0.053	0.396	6,670	368	0.007	0.070	5,980	299	0.007	0.070	4,370	37	0.004	0.070
ø 1.5	4	12,880	1,925	0.293	0.660	12,880	1,070	0.044	0.440	11,730	920	0.044	0.440	8,970	121	0.032	0.440
〃	10	8,280	1,325	0.147	0.554	8,280	736	0.031	0.282	7,590	633	0.031	0.282	5,865	83	0.022	0.282
〃	20	5,865	725	0.041	0.352	6,350	403	0.005	0.106	4,160	345	0.005	0.106	3,870	45	0.003	0.106
ø 2	6	12,535	1,801	0.314	0.836	12,535	1,001	0.042	0.792	11,730	909	0.042	0.792	9,430	130	0.035	0.792
〃	12	9,200	1,449	0.182	0.704	9,200	805	0.030	0.440	8,280	725	0.030	0.440	6,785	105	0.025	0.440
〃	20	6,900	1,139	0.091	0.651	6,200	633	0.017	0.194	3,520	564	0.017	0.194	3,226	82	0.014	0.194
〃	30	5,865	973	0.049	0.440	3,300	541	0.005	0.132	2,860	495	0.005	0.132	2,386	68	0.002	0.132
ø 2.5	10	10,350	1,801	0.331	0.836	10,350	1,001	0.051	0.528	9,775	943	0.051	0.528	8,165	151	0.047	0.528
〃	30	6,210	787	0.067	0.616	6,210	437	0.011	0.176	5,865	414	0.011	0.176	4,830	65	0.010	0.176
ø 3	12	10,350	2,029	0.381	0.831	10,350	1,127	0.103	0.616	9,775	874	0.103	0.655	8,740	196	0.073	0.655
〃	20	8,165	1,553	0.254	0.762	6,050	863	0.071	0.567	3,420	667	0.071	0.567	3,108	147	0.043	0.567
〃	30	6,900	1,263	0.137	0.674	3,300	702	0.049	0.371	2,890	541	0.049	0.371	2,440	115	0.028	0.352
ø 4	12	8,740	1,904	0.401	1.525	8,740	1,058	0.081	1.124	7,360	920	0.081	1.124	6,210	210	0.083	1.124
〃	20	6,785	1,458	0.375	1.325	5,880	810	0.053	0.880	5,750	840	0.053	0.880	4,830	194	0.057	0.880
〃	30	5,750	752	0.196	1.210	2,950	418	0.028	0.671	2,540	656	0.028	0.671	2,160	149	0.030	0.708
〃	45	4,715	500	0.096	1.118	2,300	278	0.007	0.326	2,015	322	0.007	0.326	1,800	75	0.007	0.326
ø 5	15	7,705	3,064	0.697	2.277	7,705	1,702	0.106	1.346	5,520	1,139	0.106	1.346	4,600	342	0.110	1.346
〃	30	5,290	1,470	0.342	1.760	2,780	817	0.053	1.035	3,795	541	0.053	1.035	3,220	164	0.055	1.035
ø 6	20	5,980	2,194	0.600	2.194	5,460	1,219	0.476	1.356	3,565	1,035	0.186	1.356	3,105	393	0.145	1.356
〃	40	4,600	1,635	0.565	2.049	2,380	909	0.410	1.304	2,160	759	0.164	1.304	2,040	304	0.123	1.304
ø 8	22	5,520	1,946	0.528	2.542	5,520	1,081	0.419	1.518	3,220	909	0.164	1.518	2,760	346	0.128	1.518
〃	40	4,140	1,449	0.497	2.277	2,120	805	0.361	1.323	2,080	667	0.144	1.323	1,955	268	0.108	1.323
ø 10	24	4,600	1,656	0.449	2.887	4,485	920	0.356	1.645	2,760	771	0.139	1.645	2,300	294	0.108	1.645
〃	45	3,450	1,221	0.423	2.438	3,450	679	0.307	1.334	1,955	564	0.122	1.334	1,725	228	0.092	1.334
ø 12	26	3,795	1,387	0.377	3.013	3,795	771	0.299	2.024	2,300	644	0.117	2.024	1,955	247	0.091	2.024
〃	50	2,875	1,035	0.355	2.415	2,875	575	0.258	1.403	1,725	483	0.103	1.403	1,380	191	0.077	1.403
ø 16	35	2,990	1,097	0.302	2.921	2,990	610	0.239	2.162	1,725	518	0.094	2.162	1,610	198	0.073	2.162

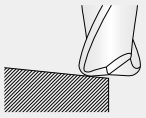
절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth





경사진면절삭 Inclined Cutting

- HRC62 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대 30% 이하로 줄이십시오.
- Ae값 설정시 코너R 치수를 고려 해주십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도내 에서 피드를 최대 30%까지 UP 해주십시오.

- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Consider the corner radius value when you set up the Ae value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.

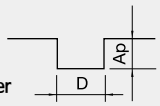
4CRE Cutting Condition

• RPM : rev./min • Feed : mm/min

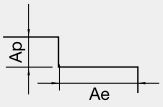
피삭재 Material		합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness		40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 1	4	13,455	1,265	0.038	0.264	11,730	1,046	0.030	0.238
〃	10	8,625	495	0.011	0.123	7,475	495	0.009	0.098
ø 1.2	4	12,880	1,380	0.031	0.440	11,730	1,070	0.023	0.293
〃	10	8,855	782	0.017	0.176	7,130	587	0.009	0.147
ø 1.5	6	11,385	1,265	0.040	0.475	10,350	1,150	0.037	0.435
〃	12	9,280	817	0.028	0.317	6,790	759	0.025	0.290
ø 2	6	12,650	1,265	0.063	0.713	11,730	1,173	0.059	0.633
〃	12	9,970	1,012	0.045	0.396	8,280	943	0.043	0.396
ø 2.5	10	10,580	1,380	0.065	0.528	9,775	1,150	0.065	0.528
〃	20	8,160	1,150	0.047	0.264	7,845	655	0.030	0.220
ø 3	10	11,040	2,070	0.094	0.684	10,235	2,070	0.059	0.684
〃	20	7,340	1,495	0.057	0.567	6,230	1,495	0.035	0.567
ø 4	13	9,085	1,576	0.105	1.150	7,590	1,530	0.082	1.150
〃	20	7,130	1,380	0.069	0.920	5,980	1,288	0.054	0.920
〃	30	6,325	1,104	0.043	0.745	5,290	1,058	0.033	0.745
ø 6	20	5,635	1,691	0.176	2.305	3,335	978	0.176	1.281
〃	40	2,875	782	0.098	1.320	1,610	460	0.098	0.733
ø 8	22	4,600	1,840	0.212	2.921	2,760	782	0.212	1.518
ø 10	24	3,680	2,013	0.253	3.140	2,185	621	0.242	1.645
ø 12	26	2,875	2,070	0.276	3.105	1,725	495	0.265	1.714

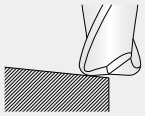
절입량 Depth of Cut

Slotting
- **Ap : Axial Depth**
- **D : Outside Diameter**



Side Milling
- **Ap : Axial Depth**
- **Ae : Radial Depth**





경사진면절삭 Inclined Cutting

- HRC62 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대30% 이하로 줄이십시오.
- Ae값 설정시 코너R 치수를 고려해 주십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.

- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Consider the corner radius value when you set up the Ae value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.

2NCR/4NCR

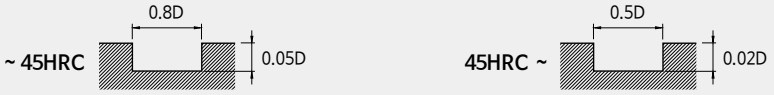
■ 4NCR은 RPM 동일, FEED만 최대 30% Up 적용.
■ Use the same RPM and raise up the feed up to 30% for 4NCR.

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	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
ø 0.4	50,000	1,065	0.020	0.32	45,000	507	0.020	0.32	40,000	221	0.008	0.20	33,000	187	0.008	0.20
ø 0.5	50,000	1,217	0.025	0.4	45,000	580	0.025	0.4	40,000	252	0.01	0.25	33,000	214	0.01	0.25
ø 0.6	50,000	1,369	0.03	0.48	45,000	652	0.03	0.48	40,000	284	0.012	0.3	30,000	241	0.012	0.3
ø 0.8	50,000	1,521	0.04	0.64	45,000	725	0.04	0.64	30,000	315	0.016	0.4	25,000	268	0.016	0.4
ø 1	48,000	3,773	0.05	0.8	38,000	1,797	0.05	0.8	25,500	781	0.02	0.5	20,500	664	0.02	0.5
ø 2	33,300	4,503	0.1	1.6	26,000	2,145	0.1	1.6	17,500	932	0.04	1	14,500	793	0.04	1
ø 3	21,800	4,564	0.15	2.4	17,300	2,174	0.15	2.4	11,500	945	0.06	1.5	9,500	803	0.06	1.5
ø 4	16,700	4,686	0.2	3.2	13,200	2,231	0.2	3.2	8,800	970	0.08	2	7,200	825	0.08	2
ø 5	15,700	4,990	0.25	4	12,500	2,376	0.25	4	8,300	1,033	0.1	2.5	6,400	878	0.1	2.5
ø 6	13,100	4,869	0.3	4.8	10,350	2,318	0.3	4.8	6,900	1,008	0.12	3	5,300	857	0.12	3
ø 8	9,880	4,443	0.4	6.4	7,800	2,116	0.4	6.4	5,200	920	0.16	4	4,000	782	0.16	4
ø 10	7,800	4,138	0.5	8	6,150	1,971	0.5	8	4,100	857	0.2	5	3,200	728	0.2	5
ø 12	6,650	4,138	0.6	9.6	5,250	1,971	0.6	9.6	3,500	857	0.24	6	2,650	728	0.24	6
ø 16	6,150	2,400	0.8	12.8	5,500	1,811	0.8	12.8	3,210	788	0.32	8	2,420	669	0.32	8

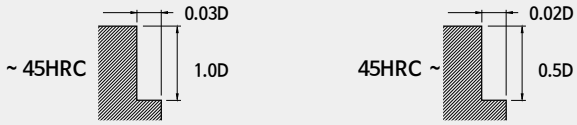
절입량 Depth of Cut



측면절삭 Side Cutting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc				55 ~ 62HRc			
외경 Outside Diameter	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
ø 0.4	50,000	1,438	0.4	0.012	45,000	735	0.4	0.012	40,000	265	0.20	0.008	33,000	252	0.20	0.008
ø 0.5	50,000	1,643	0.5	0.015	45,000	841	0.5	0.015	40,000	302	0.25	0.01	33,000	289	0.25	0.01
ø 0.6	50,000	1,848	0.6	0.018	45,000	945	0.6	0.018	40,000	341	0.30	0.012	30,000	325	0.30	0.012
ø 0.8	50,000	2,053	0.8	0.024	40,000	1,051	0.8	0.024	30,000	378	0.40	0.016	25,000	362	0.40	0.016
ø 1	48,000	5,094	1	0.03	38,000	2,606	1	0.03	25,500	937	0.50	0.02	20,500	896	0.50	0.02
ø 2	33,300	6,079	2	0.06	26,000	3,110	2	0.06	17,500	1,118	1.00	0.04	14,500	1,071	1.00	0.04
ø 3	21,800	6,161	3	0.09	17,300	3,152	3	0.09	11,500	1,134	1.50	0.06	9,500	1,804	1.50	0.06
ø 4	16,700	6,326	4	0.12	13,200	3,235	4	0.12	8,800	1,164	2.00	0.08	7,200	1,114	2.00	0.08
ø 5	15,700	6,737	5	0.15	12,500	3,445	5	0.15	8,300	1,240	2.50	0.1	6,400	1,185	2.50	0.1
ø 6	13,100	6,573	6	0.18	10,350	3,361	6	0.18	6,900	1,210	3.00	0.12	5,300	1,157	3.00	0.12
ø 8	9,880	5,998	8	0.24	7,800	3,068	8	0.24	5,200	1,104	4.00	0.16	4,000	1,056	4.00	0.16
ø 10	7,800	5,586	10	0.3	6,150	2,858	10	0.3	4,100	1,028	5.00	0.2	3,200	983	5.00	0.2
ø 12	6,650	5,586	12	0.36	5,250	2,858	12	0.36	3,500	1,028	6.00	0.24	2,650	983	6.00	0.24
ø 16	6,280	3,240	16	0.48	5,100	2,626	16	0.48	3,410	946	8.00	0.32	2,440	903	8.00	0.32

절입량 Depth of Cut



- HRC62 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜 주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대 30% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30% 까지 UP 해주십시오.
- 상기 절삭 조건표는 2날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 30%까지 UP 해주십시오.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 피삭재와 절삭 형상을 위한 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

- When milling workpiece HRC over 62, reduce 20% of the RPM and feed with the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- The parameters on the table is based on 2flutes. For using 4flutes, use the same RPM and raise up the feed up to 50% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4CRL/6CRL

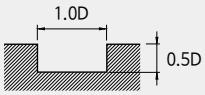
■ 6CRL은 RPM 동일, FEED만 최대 **30% Up** 적용.
■ Use the same RPM and raise up the feed up to 30% for 6CRL.

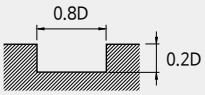
• RPM : rev./min • Feed : mm/min

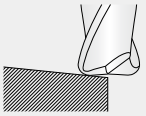
홈절삭 Slotting

피삭재 Material	구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	~30HRc				30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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
ø 1	19,250	150	0.50	1	19,250	150	0.50	1	17,280	122	0.50	1	15,552	98	0.2	0.8
ø 1.5	12,845	230	0.75	2	12,800	220	0.75	2	11,520	178	0.75	2	10,368	142	0.3	1.2
ø 2	9,600	345	1.00	2	9,500	330	1.00	2	8,550	267	1.00	2	7,695	212	0.4	1.6
ø 3	6,400	490	1.50	3	6,400	440	1.50	3	5,800	360	1.50	3	5,300	240	0.6	2.4
ø 4	4,800	550	2.00	4	4,800	500	2.00	4	4,400	410	2.00	4	4,000	280	0.8	3.2
ø 5	3,850	600	2.50	5	3,800	550	2.50	5	3,420	446	2.50	5	3,078	356	1.0	4.0
ø 6	3,200	610	3.00	6	3,200	550	3.00	6	2,900	450	3.00	6	2,700	310	1.2	4.8
ø 8	2,400	650	4.00	8	2,400	590	4.00	8	2,200	480	4.00	8	2,000	330	1.6	6.4
ø 10	1,900	580	5.00	10	1,900	520	5.00	10	1,800	440	5.00	10	1,600	290	2.0	8.0
ø 12	1,600	540	6.00	12	1,600	480	6.00	12	1,500	400	6.00	12	1,300	260	2.4	9.6
ø 16	1,200	520	8.00	16	1,200	510	8.00	16	1,080	413	8.00	16	972	328	3.2	12.8
ø 20	960	510	10.00	20	950	500	10.00	20	855	405	10.00	20	770	324	4.0	16.0

절입량 Depth of Cut

~ 45HRC 

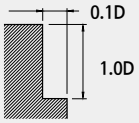
45HRC ~ 

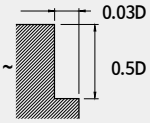

경사진면절삭 Inclined Cutting

측면절삭 Side Cutting

피삭재 Material	구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	~30HRc				30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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
ø 1	28,790	115	1	0.1	25,911	104	1	0.1	22,024	88	0.5	0.03	17,619	70	0.5	0.03
ø 1.5	19,200	403	2	0.2	17,280	363	2	0.2	14,688	308	0.8	0.045	11,750	247	0.8	0.045
ø 2	14,400	690	2	0.2	12,960	621	2	0.2	11,016	528	1.0	0.06	8,813	422	1.0	0.06
ø 3	9,600	860	3	0.3	9,600	770	3	0.3	8,500	610	1.5	0.09	7,400	460	1.5	0.09
ø 4	7,200	920	4	0.4	7,200	830	4	0.4	6,400	660	2.0	0.12	5,600	500	2.0	0.12
ø 5	5,750	960	5	0.5	5,175	864	5	0.5	4,399	734	2.5	0.15	3,519	588	2.5	0.15
ø 6	4,800	1,080	6	0.6	4,800	970	6	0.6	5,100	720	3.0	0.18	3,700	580	3.0	0.18
ø 8	3,600	1,150	8	0.8	3,600	1,040	8	0.8	4,200	750	4.0	0.24	2,800	630	4.0	0.24
ø 10	2,900	1,070	10	1.0	2,900	960	10	1.0	2,500	740	5.0	0.3	2,200	570	5.0	0.3
ø 12	2,400	1,000	12	1.2	2,400	900	12	1.2	2,100	700	6.0	0.36	1,900	550	6.0	0.36
ø 16	1,800	1,000	16	1.6	1,620	900	16	1.6	1,377	765	8.0	0.48	1,102	612	8.0	0.48
ø 20	1,440	930	20	2.0	1,296	837	20	2.0	1,102	711	10.0	0.6	881	569	10.0	0.6

절입량 Depth of Cut

~ 35HRC 

35HRC ~ 

- 상기 조건표는 4날 기준이며, 6날 가공시 회전수는 유지하고, 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대30% 이하로 줄이십시오.
- 측면 절삭시 코너R 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 소재 및 가공 형상에 적합한 절삭유를 사용 하십시오.

- The parameters on the table is based on 4flutes. For using 6flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For side milling, refer to the corner radius value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use suitable cutting oil for material and machining geometry.

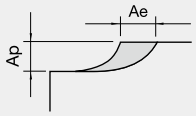
4RCU/6RCU

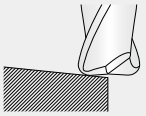
■ 6RCU은 RPM 동일, FEED만 최대 **30% Up** 적용.
■ Use the same RPM and raise up the feed up to 30% for 6RCU.

• RPM : rev./min • Feed : mm/min

피삭재 Material		구조용강 / 탄소강 / 회주철 Mild steels / Carbon Steels / Gray cast irons SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness		~ 30HRc				30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	반경 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
ø 1	R0.2	42,840	7,871	0.02	0.4	35,700	6,845	0.02	0.4	29,750	5,738	0.015	0.3	22,500	4,835	0.015	0.3
ø 1.5	R0.5	40,800	8,073	0.02	0.6	34,000	7,020	0.02	0.6	25,500	5,738	0.023	0.5	18,900	4,837	0.023	0.5
ø 2	R0.5	27,540	8,477	0.03	0.8	22,950	7,371	0.03	0.8	20,400	5,739	0.03	0.6	14,400	4,839	0.03	0.6
ø 3	R0.5	18,360	9,082	0.05	1.2	15,300	7,898	0.05	1.2	13,600	5,740	0.045	0.9	9,900	4,841	0.045	0.9
ø 4	R0.5	16,320	10,091	0.06	1.6	13,600	8,775	0.06	1.6	11,050	5,741	0.06	1.2	8,100	4,843	0.06	1.2
〃	R1.0	14,280	9,587	0.06	1.6	11,900	8,336	0.06	1.6	10,200	5,742	0.06	1.2	7,200	4,845	0.06	1.2
ø 5	R0.5	12,240	12,110	0.08	2.0	10,200	10,530	0.08	2.0	9,350	5,743	0.075	1.5	6,570	4,846	0.075	1.5
〃	R1.0	11,220	11,100	0.08	2.0	9,350	9,653	0.08	2.0	8,160	5,743	0.075	1.5	5,760	4,848	0.075	1.5
ø 6	R0.3	11,118	13,320	0.09	2.4	9,265	11,583	0.09	2.4	8,500	5,744	0.09	1.8	5,850	4,850	0.09	1.8
〃	R0.5	10,812	13,119	0.09	2.4	9,010	11,408	0.09	2.4	8,075	5,745	0.09	1.8	5,670	4,852	0.09	1.8
〃	R1.0	12,907	12,715	0.09	2.4	10,756	11,057	0.09	2.4	7,650	5,747	0.09	1.8	5,220	4,854	0.09	1.8
〃	R1.5	9,180	11,100	0.09	2.4	7,650	9,653	0.09	2.4	6,800	5,747	0.09	1.8	4,770	4,856	0.09	1.8
ø 8	R0.3	8,568	13,623	0.12	3.2	7,140	11,846	0.12	3.2	6,205	5,748	0.12	2.4	4,230	4,858	0.09	2.4
〃	R0.5	8,364	13,119	0.12	3.2	6,970	11,408	0.12	3.2	6,035	5,748	0.12	2.4	4,140	4,859	0.12	2.4
〃	R1.0	8,160	12,110	0.12	3.2	6,800	10,530	0.12	3.2	5,695	5,749	0.12	2.4	4,068	4,861	0.12	2.4
〃	R2.0	7,140	11,100	0.12	3.2	5,950	9,653	0.12	3.2	5,100	5,750	0.12	2.4	3,600	4,863	0.12	2.4
ø 10	R0.3	6,620	13,098	0.15	4.0	5,517	11,390	0.15	4.0	4,814	5,751	0.15	3.0	3,398	4,865	0.15	3.0
〃	R0.5	6,452	12,765	0.15	4.0	5,376	11,100	0.15	4.0	4,692	8,752	0.15	3.0	3,312	4,867	0.15	3.0
〃	R1.0	6,283	12,432	0.15	4.0	5,236	10,811	0.15	4.0	4,570	5,753	0.15	3.0	3,226	4,869	0.15	3.0
〃	R2.0	5,610	11,100	0.15	4.0	4,675	9,653	0.15	4.0	4,080	5,754	0.15	3.0	2,880	4,871	0.15	3.0
ø 12	R0.5	5,537	11,908	0.18	4.8	4,614	10,355	0.18	4.8	4,112	5,754	0.18	3.6	2,867	4,872	0.18	3.6
〃	R1.0	5,396	11,605	0.18	4.8	4,497	10,091	0.18	4.8	4,008	5,755	0.18	3.6	2,795	4,874	0.18	3.6
〃	R2.0	5,255	11,302	0.18	4.8	4,379	9,828	0.18	4.8	3,903	5,756	0.18	3.6	2,722	4,876	0.18	3.6
〃	R3.0	4,692	10,091	0.18	4.8	3,910	8,775	0.18	4.8	3,485	5,757	0.18	3.6	2,430	4,878	0.18	3.6
ø 16	R1.0	4,092	10,479	0.24	6.4	3,410	9,112	0.24	6.4	3,009	5,758	0.24	4.8	2,124	4,880	0.24	4.8
〃	R2.0	3,468	8,880	0.24	6.4	2,890	7,722	0.24	6.4	2,550	5,759	0.24	4.8	1,800	4,882	0.24	4.8

절입량 Depth of Cut





경사진면절삭 Inclined Cutting

■ Coefficients respective of tool overhang

Type	Overhang	Revolution	Feed rate	Depth of Cut ap
Straight	L/D ≦ 5	100%	100%	100%
	L/D = 6	90%	80%	80%
	L/D = 7	80%	70%	70%
Taper neck	L/D = 6	100%	100%	100%
	L/D = 8	90%	80%	80%
	L/D ≧ 10	80%	70%	70%

- 상기 조건표는 4날 기준이며, 6날 가공시 회전수는 유지하고, 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 유효장이 긴 경우에는 회전수와 이송 속도를 최대30% 이하로 줄이십시오.
- 측면 절삭시 코너R 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 유효장 길이가 긴 경우, 위 표와같이 RPM과 FEED를 낮춰주세요.
- 절입깊이가 얕은 경우, RPM과 FEED를 증가해주세요
- 원활한 칩배출을 위하여 에어브로우나 오일 미스트를 추천합니다.

- The parameters on the table is based on 4flutes. For using 6flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For side milling, refer to the corner radius value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% 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.
- If the effective length is long, refer to the table (Coefficients respective of tool overhang) and adjust the RPM and feed.
- If you use small value of Ap, raise up the RPM and feed.
- Air blow or oil mist is recommended for smooth chip emission.

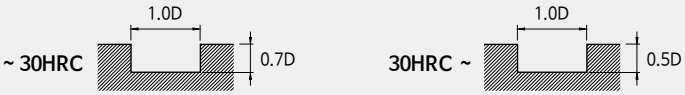
3&4ROU Cutting Condition

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels / Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steel NAK80 / KP4M / SUS304 / SUS316			
경도 Hardness	~ 200HB				~ 30HRc				30 ~ 40HRc				40 ~ 45HRc			
외경 Outside Diameter	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
ø 4	4,000	211	0.25	4	4,000	430	2.8	4	3,800	200	2.8	4	2,800	110	2	4
ø 5	4,000	242	0.35	5	4,000	430	3.5	5	3,400	220	3.5	5	2,500	130	2.5	5
ø 6	3,600	281	0.40	6	3,600	430	4.2	6	3,000	240	4.2	6	2,300	150	3	6
ø 8	2,700	338	0.55	8	2,700	430	5.6	8	2,200	270	5.6	8	1,800	180	4	8
ø 10	2,200	380	0.70	10	2,200	430	7	10	1,800	290	7	10	1,400	185	5	10
ø 12	1,800	332	0.85	12	1,800	430	8.4	12	1,500	300	8.4	12	1,200	190	6	12
ø 16	1,400	305	1.10	16	1,400	430	11.2	16	1,100	310	11.2	16	900	200	8	16
ø 20	1,100	281	1.40	20	1,100	430	14	20	900	310	14	20	700	185	10	20

절입량 Depth of Cut



측면절삭 Side Cutting

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels / Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steel NAK80 / KP4M / SUS304 / SUS316			
경도 Hardness	~ 200HB				~ 30HRc				30 ~ 40HRc				40 ~ 45HRc			
외경 Outside Diameter	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
ø 4	5,000	469	6	0.12	4,200	398	6	0.12	3,600	359	6	0.12	2,800	305	4	0.08
ø 5	5,000	538	7.5	0.15	4,200	457	7.5	0.15	3,200	411	7.5	0.15	2,400	350	5	0.10
ø 6	4,200	625	9	0.18	3,600	531	9	0.18	2,800	478	9	0.18	2,100	406	6	0.12
ø 8	3,200	750	12	0.24	2,700	638	12	0.24	2,100	574	12	0.24	1,600	488	8	0.16
ø 10	2,600	844	15	0.3	2,200	717	15	0.3	1,600	645	15	0.3	1,300	549	10	0.20
ø 12	2,100	738	18	0.36	1,800	627	18	0.36	1,400	564	18	0.36	1,100	480	12	0.24
ø 16	1,600	678	21	0.48	1,400	576	21	0.48	1,000	519	21	0.48	800	441	16	0.32
ø 20	1,300	625	30	0.6	1,100	531	30	0.6	800	478	30	0.6	640	406	20	0.40

절입량 Depth of Cut

- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적 입니다.

- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

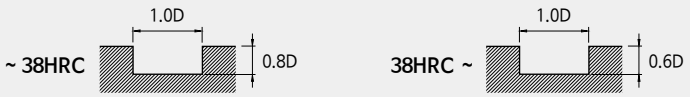
3&4HROU Cutting Condition

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels / Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steel NAK80 / KP4M / SUS304 / SUS316			
경도 Hardness	~ 200HB				~ 30HRc				30 ~ 40HRc				40 ~ 45HRc			
외경 Outside Diameter	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
ø 4	4,600	264	3.2	4	4,400	224	3.2	4	3,200	179	3.2	4	2,800	117	2.4	4
ø 5	4,600	302	4	5	4,000	257	4	5	2,900	206	4	5	2,500	134	3.0	5
ø 6	4,100	352	4.8	6	3,500	299	4.8	6	2,700	239	4.8	6	2,200	155	3.6	6
ø 8	3,100	422	6.4	8	2,500	359	6.4	8	2,100	287	6.4	8	1,700	186	4.8	8
ø 10	2,500	475	8	10	2,100	403	8	10	1,600	323	8	10	1,300	210	6.0	10
ø 12	2,100	415	9.6	12	1,700	353	9.6	12	1,400	282	9.6	12	1,100	183	7.2	12
ø 16	1,600	381	12.8	16	1,300	324	12.8	16	1,000	259	12.8	16	800	169	9.6	16
ø 20	1,300	352	16	20	1,000	299	16	20	800	239	16	20	650	155	12	20

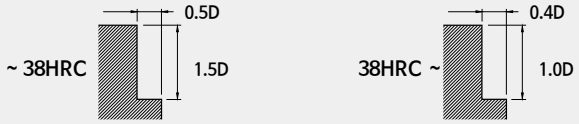
절입량 Depth of Cut



측면절삭 Side Cutting

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels / Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steel NAK80 / KP4M / SUS304 / SUS316			
경도 Hardness	~ 200HB				~ 30HRc				30 ~ 40HRc				40 ~ 45HRc			
외경 Outside Diameter	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
ø 4	5,800	539	6	2	4,800	458	6	2	4,800	458	6	2	3,200	351	4	1.6
ø 5	5,800	318	7.5	2.5	4,800	525	7.5	2.5	4,800	525	7.5	2.5	2,800	402	5	2.0
ø 6	4,800	719	9	3	4,200	611	9	3	4,200	611	9	3	2,400	467	6	2.4
ø 8	3,700	863	12	4	3,100	733	12	4	3,100	733	12	4	1,800	561	8	3.2
ø 10	3,000	970	15	5	2,500	825	15	5	2,500	825	15	5	1,500	631	10	4.0
ø 12	2,400	848	18	6	2,100	721	18	6	2,100	721	18	6	1,300	551	12	4.8
ø 16	1,850	780	24	8	1,600	663	24	8	1,600	663	24	8	1,000	507	16	6.4
ø 20	1,500	719	30	10	1,300	611	30	10	1,300	611	30	10	750	467	20	8.0

절입량 Depth of Cut



- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적 입니다.

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- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

2HRBE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness		30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
반경 Corner Radius	유효장 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
R 0.1	0.5	54,000	430	0.010	0.010	48,000	350	0.006	0.007	48,000	280	0.006	0.007
〃	1	54,000	380	0.008	0.008	48,000	330	0.005	0.005	48,000	250	0.005	0.005
〃	1.5	47,000	320	0.006	0.006	47,000	250	0.004	0.004	47,000	200	0.004	0.004
〃	2	42,000	290	0.004	0.004	42,000	200	0.003	0.003	42,000	200	0.003	0.003
R 0.15	1	54,000	640	0.014	0.015	48,000	480	0.010	0.010	41,000	370	0.009	0.010
〃	2	49,000	530	0.011	0.011	43,000	370	0.008	0.008	37,000	270	0.008	0.008
〃	3	43,000	460	0.009	0.010	38,000	320	0.007	0.006	32,000	240	0.006	0.006
〃	4	37,000	300	0.004	0.006	28,000	200	0.003	0.004	24,000	160	0.003	0.004
R 0.2	1	54,000	870	0.023	0.036	48,000	660	0.018	0.024	37,000	450	0.015	0.024
〃	2	54,000	790	0.022	0.036	48,000	590	0.018	0.024	37,000	400	0.015	0.020
〃	3	50,000	660	0.017	0.018	41,000	420	0.012	0.012	31,000	280	0.011	0.012
〃	4	50,000	640	0.012	0.018	38,000	400	0.009	0.012	30,000	270	0.009	0.012
〃	5	37,000	410	0.009	0.018	29,000	330	0.008	0.012	26,000	260	0.007	0.012
〃	6	37,000	360	0.006	0.010	29,000	260	0.005	0.006	26,000	200	0.004	0.006
〃	8	27,000	200	0.003	0.006	27,000	170	0.003	0.003	23,000	150	0.002	0.003
R 0.25	1	57,000	1,380	0.029	0.054	42,000	830	0.023	0.036	32,000	550	0.018	0.036
〃	2	57,000	1,250	0.028	0.054	42,000	750	0.022	0.036	32,000	500	0.018	0.036
〃	3	55,000	1,010	0.021	0.036	38,000	580	0.017	0.024	31,000	400	0.014	0.024
〃	4	55,000	1,010	0.021	0.036	38,000	580	0.017	0.024	31,000	400	0.014	0.024
〃	5	48,000	800	0.016	0.018	33,000	480	0.012	0.012	30,000	390	0.009	0.012
〃	6	36,000	610	0.009	0.018	28,000	400	0.008	0.012	27,000	330	0.005	0.012
〃	8	36,000	590	0.009	0.018	28,000	400	0.008	0.012	27,000	330	0.005	0.012
〃	10	36,000	460	0.009	0.018	28,000	400	0.008	0.012	27,000	330	0.005	0.012
〃	12	24,000	280	0.004	0.010	26,000	280	0.004	0.006	24,000	280	0.002	0.006
R 0.3	1	57,000	1,670	0.035	0.144	37,000	840	0.027	0.096	27,000	540	0.023	0.096
〃	2	57,000	1,540	0.034	0.144	37,000	770	0.027	0.096	27,000	500	0.021	0.096
〃	3	57,000	1,540	0.034	0.144	37,000	770	0.027	0.096	27,000	500	0.021	0.096
〃	4	54,000	1,130	0.026	0.108	35,000	600	0.020	0.072	26,000	380	0.016	0.072
〃	5	46,000	960	0.019	0.072	28,000	460	0.016	0.048	26,000	370	0.012	0.048
〃	6	46,000	960	0.019	0.072	28,000	460	0.016	0.048	26,000	370	0.012	0.048
〃	8	30,000	570	0.010	0.054	24,000	400	0.009	0.036	23,000	320	0.006	0.036
〃	10	30,000	490	0.007	0.036	24,000	330	0.006	0.024	23,000	290	0.004	0.024
〃	12	30,000	490	0.007	0.036	24,000	330	0.006	0.024	23,000	290	0.004	0.024
〃	14	20,000	300	0.004	0.027	22,000	300	0.004	0.018	20,000	250	0.002	0.018
R 0.35	2	56,000	1,800	0.050	0.162	35,000	740	0.039	0.108	27,000	500	0.031	0.108
〃	4	54,500	1,500	0.045	0.063	33,000	600	0.035	0.096	26,500	410	0.029	0.096
〃	8	32,000	800	0.019	0.072	12,215	420	0.020	0.048	22,500	355	0.012	0.048
〃	10	26,500	540	0.017	0.063	22,500	380	0.014	0.042	21,500	330	0.011	0.042
〃	12	23,000	420	0.017	0.063	21,500	380	0.012	0.032	21,500	320	0.010	0.042
R 0.4	2	55,000	2,060	0.063	0.180	33,000	710	0.050	0.120	27,000	500	0.041	0.120
〃	4	55,000	1,860	0.063	0.180	31,000	600	0.050	0.120	27,000	440	0.041	0.120
〃	6	47,000	1,410	0.038	0.108	28,000	570	0.030	0.072	22,000	390	0.024	0.072
〃	8	34,000	1,040	0.027	0.090	21,000	430	0.021	0.060	22,000	390	0.018	0.060
〃	10	23,000	600	0.027	0.090	21,000	430	0.021	0.060	20,000	370	0.017	0.060
〃	12	16,000	350	0.027	0.090	19,000	430	0.018	0.040	20,000	350	0.016	0.060
R 0.45	6	50,500	1,900	0.067	0.190	32,000	685	0.054	0.130	24,500	460	0.043	0.180
R 0.5	2	46,000	2,000	0.072	0.360	32,000	770	0.057	0.240	22,000	480	0.045	0.240
〃	3	46,000	2,000	0.072	0.360	32,000	770	0.057	0.240	22,000	480	0.045	0.240
〃	4	46,000	2,000	0.071	0.360	32,000	770	0.057	0.240	22,000	480	0.045	0.240
〃	5	46,000	2,000	0.071	0.360	32,000	770	0.057	0.240	22,000	480	0.045	0.240
〃	6	39,000	1,500	0.071	0.180	26,000	760	0.055	0.120	17,600	480	0.045	0.120
〃	8	39,000	1,500	0.043	0.180	26,000	760	0.034	0.120	17,600	480	0.027	0.120
〃	10	29,000	1,110	0.028	0.090	17,600	530	0.024	0.060	16,500	420	0.018	0.060
〃	12	18,700	660	0.027	0.090	17,600	530	0.024	0.060	16,500	420	0.018	0.060
〃	14	18,700	640	0.022	0.090	15,400	440	0.018	0.060	14,300	360	0.014	0.060
〃	16	18,700	640	0.022	0.090	15,400	440	0.018	0.060	14,300	360	0.014	0.060
〃	18	18,700	540	0.017	0.090	14,300	440	0.013	0.060	13,200	360	0.009	0.060
〃	20	18,700	540	0.017	0.054	14,300	360	0.013	0.036	13,200	300	0.009	0.036
〃	22	18,700	540	0.017	0.054	14,300	360	0.013	0.036	13,200	300	0.009	0.036
〃	25	18,700	540	0.016	0.052	14,300	360	0.013	0.030	13,200	300	0.009	0.030
R 0.6	4	38,000	2,000	0.085	0.360	26,000	770	0.068	0.240	18,200	480	0.054	0.240
〃	6	38,000	2,000	0.085	0.360	26,000	770	0.068	0.240	18,200	480	0.054	0.240
〃	8	32,000	1,490	0.084	0.360	21,000	700	0.067	0.240	15,100	440	0.054	0.240
〃	10	24,000	1,080	0.036	0.180	16,400	530	0.027	0.120	15,100	420	0.022	0.120
〃	12	24,000	1,080	0.036	0.180	15,300	530	0.027	0.120	14,100	420	0.022	0.120
〃	16	15,400	580	0.024	0.144	13,100	460	0.019	0.096	11,900	380	0.016	0.096
〃	20	15,400	580	0.017	0.090	12,100	380	0.013	0.060	11,000	320	0.009	0.060
〃	24	15,400	580	0.010	0.060	11,100	320	0.009	0.040	9,800	290	0.070	0.040

2HRBE Cutting Condition

• RPM : rev./min • Feed : mm/min

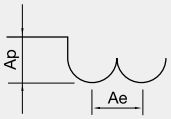
피삭재 Material		공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness		30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
반경 Corner Radius	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.7	6	28,000	1,470	0.099	0.270	17,600	680	0.076	0.180	13,600	440	0.063	0.180
〃	8	28,000	1,470	0.099	0.270	17,600	680	0.079	0.180	13,600	440	0.063	0.180
〃	12	19,800	1,080	0.042	0.270	13,800	530	0.033	0.180	13,600	420	0.027	0.180
〃	16	13,200	620	0.033	0.180	13,100	480	0.027	0.120	11,900	390	0.021	0.120
R 0.75	3	30,000	2,200	0.171	0.324	21,000	1060	0.137	0.216	14,800	660	0.110	0.216
〃	4	30,000	2,200	0.171	0.324	21,000	1060	0.137	0.216	14,800	660	0.110	0.216
〃	6	30,000	1,980	0.147	0.324	21,000	940	0.117	0.216	14,800	580	0.090	0.216
〃	8	26,000	1,500	0.106	0.270	16,300	700	0.084	0.180	12,100	450	0.069	0.180
〃	10	26,000	1,500	0.106	0.270	16,300	700	0.084	0.180	12,100	450	0.069	0.180
〃	12	26,000	1,500	0.106	0.270	16,300	700	0.084	0.180	12,100	450	0.069	0.180
〃	14	18,700	1,100	0.045	0.180	12,600	530	0.036	0.120	12,100	440	0.027	0.120
〃	16	12,100	620	0.036	0.180	12,400	480	0.027	0.120	11,600	390	0.022	0.120
〃	18	12,100	620	0.036	0.180	12,400	480	0.027	0.120	11,600	390	0.022	0.120
〃	20	12,100	620	0.019	0.090	12,400	480	0.016	0.060	11,600	390	0.012	0.060
〃	22	12,100	620	0.019	0.090	12,400	480	0.016	0.060	11,000	390	0.012	0.060
〃	25	11,000	500	0.019	0.090	12,400	440	0.016	0.060	11,000	390	0.012	0.060
〃	30	10,700	450	0.019	0.090	10,900	400	0.016	0.060	11,000	390	0.012	0.060
R 0.8	6	27,040	2,600	0.220	0.580	18,900	1200	0.180	0.390	1,650	760	0.150	0.390
〃	8	26,000	1,970	0.157	0.324	18,900	940	0.126	0.216	13,800	580	0.102	0.216
〃	12	25,000	1,490	0.112	0.180	15,100	700	0.090	0.120	11,500	440	0.072	0.120
〃	16	17,600	110	0.046	0.144	12,300	530	0.036	0.096	11,400	440	0.030	0.096
〃	20	11,000	630	0.036	0.090	11,500	480	0.030	0.060	10,900	400	0.024	0.060
R 0.9	6	32,000	2,600	0.230	0.300	18,400	1200	0.185	0.320	18,400	738	0.150	0.320
〃	8	26,000	1,950	0.165	0.270	16,300	930	0.132	0.240	13,800	570	0.108	0.240
〃	12	21,000	1,480	0.120	0.270	13,800	700	0.094	0.180	10,300	440	0.077	0.180
〃	16	15,400	1,080	0.048	0.180	10,800	530	0.039	0.120	9,900	420	0.031	0.120
〃	20	10,500	630	0.039	0.090	10,200	480	0.031	0.060	9,700	400	0.025	0.060
R 1	4	22,000	2,140	0.232	0.540	18,500	1260	0.185	0.360	13,200	960	0.150	0.360
〃	6	22,000	2,140	0.232	0.540	18,500	1260	0.185	0.360	13,200	960	0.150	0.360
〃	8	22,000	1,920	0.185	0.360	18,500	1120	0.147	0.240	13,200	870	0.120	0.240
〃	10	22,000	1,920	0.185	0.360	18,500	1120	0.147	0.240	13,200	870	0.120	0.240
〃	12	18,700	1,470	0.166	0.360	16,000	990	0.133	0.240	11,700	780	0.107	0.240
〃	14	18,700	1,470	0.166	0.360	16,000	990	0.133	0.240	11,700	780	0.107	0.240
〃	16	18,700	1,470	0.148	0.360	16,000	990	0.118	0.240	11,700	780	0.090	0.240
〃	18	14,300	1,070	0.093	0.180	14,700	580	0.074	0.120	11,600	580	0.061	0.120
〃	20	14,300	1,070	0.093	0.180	14,700	580	0.074	0.120	11,600	580	0.061	0.120
〃	22	9,500	630	0.074	0.180	10,600	450	0.058	0.120	10,200	450	0.045	0.120
〃	25	9,500	630	0.074	0.180	10,600	450	0.058	0.120	10,200	450	0.045	0.120
〃	30	9,500	530	0.033	0.090	10,600	450	0.026	0.060	10,200	380	0.021	0.060
R 1.25	8	18,400	2,400	0.232	0.360	14,500	1400	0.185	0.240	9,700	1080	0.150	0.240
〃	10	18,400	2,400	0.232	0.360	14,500	1400	0.185	0.240	9,700	1080	0.150	0.240
〃	16	16,100	1,810	0.208	0.360	13,500	1230	0.166	0.240	8,400	980	0.135	0.240
〃	20	11,500	1,330	0.116	0.180	10,200	950	0.093	0.120	8,400	980	0.074	0.120
〃	25	6,900	770	0.093	0.180	8,400	540	0.074	0.120	8,400	560	0.061	0.120
〃	30	6,900	770	0.040	0.090	8,400	540	0.033	0.060	8,400	560	0.026	0.060
R 1.5	6	15,000	2,890	0.278	0.540	12,900	1680	0.222	0.360	9,200	1300	0.180	0.360
〃	8	15,000	2,890	0.278	0.540	12,900	1680	0.222	0.360	9,200	1300	0.180	0.360
〃	10	15,000	2,600	0.278	0.540	12,900	1680	0.222	0.360	9,200	1300	0.180	0.360
〃	12	15,000	2,600	0.278	0.540	12,900	1510	0.222	0.360	9,200	1170	0.180	0.360
〃	16	12,700	1,970	0.029	0.504	11,300	1330	0.166	0.360	8,100	1040	0.135	0.360
〃	20	12,700	1,970	0.029	0.504	11,300	1330	0.166	0.360	8,100	1040	0.135	0.360
〃	25	10,100	1,450	0.139	0.270	8,800	1040	0.111	0.180	8,100	1040	0.090	0.180
〃	30	10,100	1,450	0.139	0.270	8,800	780	0.111	0.180	8,100	780	0.090	0.180
〃	35	6,600	840	0.073	0.270	7,900	620	0.055	0.180	7,500	650	0.045	0.180
〃	40	6,600	840	0.073	0.270	7,900	620	0.055	0.180	7,500	520	0.045	0.180
〃	45	4,500	500	0.040	0.270	6,200	500	0.035	0.180	7,000	450	0.023	0.180
R 2	8	11,500	2,710	0.370	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
〃	10	11,500	2,710	0.370	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
〃	12	11,500	2,710	0.390	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
〃	16	11,500	2,710	0.390	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
〃	20	11,500	2,710	0.390	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
〃	25	10,300	1,850	0.279	0.540	8,400	1250	0.223	0.360	6,000	980	0.180	0.360
〃	30	10,300	1,850	0.279	0.540	8,400	1250	0.223	0.360	6,000	980	0.180	0.361
〃	35	7,500	1,360	0.185	0.540	6,600	950	0.148	0.360	6,000	700	0.120	0.360
〃	40	7,500	1,360	0.185	0.540	6,600	950	0.148	0.360	6,000	700	0.120	0.360
〃	45	5,000	780	0.093	0.360	5,900	470	0.074	0.240	5,600	490	0.060	0.240

2HRBE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness		30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
반경 Corner Radius	유효장 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
R 2.5	16	9,600	2,590	0.406	0.900	7,800	1350	0.324	0.800	5,600	1050	0.252	0.800
〃	20	9,600	2,100	0.406	0.900	7,800	1240	0.324	0.600	5,600	950	0.252	0.600
〃	25	9,600	2,100	0.406	0.900	7,800	1240	0.324	0.600	5,600	950	0.252	0.600
〃	30	8,200	1,320	0.305	0.900	7,800	760	0.243	0.600	4,800	600	0.197	0.600
〃	40	7,000	830	0.230	0.900	7,800	470	0.200	0.600	4,300	380	0.154	0.600
R 3	15	8,000	2,530	0.555	1.800	7,400	1670	0.443	1.200	5,200	1300	0.360	1.200
R 4	25	9,000	2,400	0.600	1.500	7,200	1200	0.500	1.000	5,200	920	0.350	1.000
R 5	30	7,800	1,300	0.300	0.900	6,800	720	0.230	0.600	4,600	570	0.190	0.570
R 6	30	7,410	1,235	0.285	0.855	6,350	684	0.210	0.570	4,370	541	0.181	0.550

절입량 Depth of Cut



Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- HRC52 이상 고경도강 가공시 같은 직경의 같인 비율로 20% DOWN 시켜주십시오.
- 유효장이 없는 절삭조건은 같은 직경에 더 짧은 유효장 대비 같은 비율로 DOWN 해주십시오.
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동가공시 습식 쿨런트 추천 합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

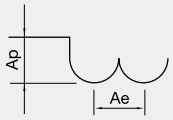
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- In case of long effective length, reduce the RPM and feed in same proportion.
- Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- During the chip evacuation, note for heat and ignition.

2HCBE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
반경 Corner 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
R 0.15	35,100	650	0.100	0.015	31,200	478	0.093	0.015	25,740	364	0.088	0.015
R 0.2	35,100	765	0.200	0.020	31,200	582	0.186	0.020	25,740	468	0.176	0.020
R 0.25	35,100	1165	0.300	0.025	31,200	915	0.279	0.025	25,740	728	0.264	0.025
R 0.3	35,100	1498	0.350	0.030	31,200	1186	0.326	0.030	23,400	832	0.308	0.030
R 0.35	31,200	1830	0.400	0.040	23,400	1227	0.372	0.040	19,500	962	0.352	0.040
R0.4	30,420	2163	0.450	0.045	21,684	1373	0.419	0.045	17,706	1066	0.396	0.045
R0.5	29,640	2371	0.450	0.050	19,890	1498	0.419	0.050	15,990	1118	0.396	0.050
R0.75	24,960	2600	0.525	0.075	16,770	1622	0.488	0.075	13,650	1235	0.462	0.075
R 1	20,280	2829	0.600	0.100	13,650	1747	0.558	0.100	11,310	1352	0.528	0.100
R1.25	16,887	2829	0.700	0.125	11,310	1747	0.651	0.125	9,360	1352	0.616	0.125
R1.5	13,494	2829	0.800	0.150	8,970	1747	0.744	0.150	7,410	1352	0.704	0.150
R2	10,296	2912	1.000	0.200	6,864	1830	0.930	0.200	5,616	1404	0.880	0.200
R2.5	9,750	3349	1.200	0.250	6,474	2080	1.116	0.250	4,992	1482	1.056	0.250
R3	8,073	3203	1.500	0.300	5,382	1997	1.395	0.300	4,134	1456	1.320	0.300
R4	6,084	2995	2.000	0.400	4,056	1851	1.860	0.400	3,120	1326	1.760	0.400
R5	4,797	2829	2.500	1.000	3,198	1726	2.325	1.000	2,496	1248	2.200	1.000
R6	4,095	2829	3.000	1.200	2,730	1726	2.790	1.200	2,067	1248	2.640	1.200
R8	3,385	2538	4.000	1.600	2,028	1498	3.720	1.600	1,435	935	3.520	1.600

절입량 Depth of Cut



Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 없는 절삭조건은 같은 직경에 더 짧은 유효장 대비 같은 비율로 DOWN 해주십시오.
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 에어브로 혹은 미스트 쿨런트를 추천하며, 동가공시 습식 쿨런트 추천 합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- In case of long effective length, reduce the RPM and feed in same proportion.
- Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 5㎛).
- During the chip evacuation, note for heat and ignition.

2HCEE/4HCEE

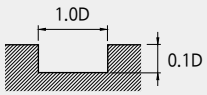
■ 4HCEE는 RPM 동일, FEED만 최대 30% Up 적용.
■ Use the same RPM and raise up the feed up to 30% for 4HCEE.

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM/HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 0.2	50,000	230	0.02	0.20	45,000	207	0.01	0.10	40,000	176	0.01	0.10
ø 0.5	50,000	660	0.05	0.50	45,000	594	0.03	0.25	40,000	505	0.03	0.25
ø 0.7	50,000	810	0.07	0.70	45,000	729	0.04	0.35	37,500	620	0.04	0.35
ø 0.9	49,000	1,180	0.09	0.90	39,000	1062	0.05	0.45	27,800	903	0.05	0.45
ø 1	48,000	1,350	0.10	1.00	38,000	1215	0.05	0.50	25,500	1033	0.05	0.50
ø 1.5	42,000	1,440	0.15	1.50	30,000	1296	0.08	0.75	21,500	1102	0.08	0.75
ø 2	33,300	1,530	0.20	2.00	26,000	1377	0.10	1.00	17,500	1170	0.10	1.00
ø 2.5	26,500	1,530	0.25	2.50	22,500	1377	0.13	1.25	15,800	1170	0.13	1.25
ø 3	21,800	1,800	0.30	3.00	17,300	1620	0.15	1.50	11,500	1377	0.15	1.50
ø 4	16,700	2,160	0.40	4.00	13,200	1944	0.20	2.00	8,800	1652	0.20	2.00
ø 5	15,700	2,610	0.50	5.00	12,500	2349	0.25	2.50	8,300	1997	0.25	2.50
ø 6	13,100	2,700	0.60	6.00	10,350	2430	0.30	3.00	6,900	2066	0.30	3.00
ø 8	9,880	2,375	0.80	8.00	7,800	2137	0.40	4.00	5,200	1817	0.40	4.00
ø 10	7,800	2,050	1.00	10.00	6,150	1845	0.50	5.00	4,100	1568	0.50	5.00
ø 12	6,650	1,710	1.20	12.00	5,250	1539	0.60	6.00	3,500	1308	0.60	6.00
ø 16	5,540	1,670	1.60	16.00	4,340	1503	0.80	8.00	2,600	1278	0.80	8.00

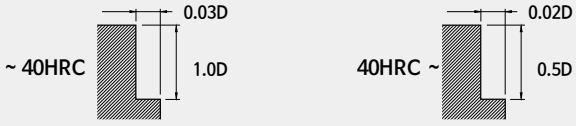
절입량 Depth of Cut



측면절삭 Side Cutting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM/HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 1	48,000	1,260	1.00	0.03	38,000	980	0.50	0.02	25,500	610	0.50	0.02
ø 2	33,300	1,440	2.00	0.06	26,000	1160	1.00	0.04	17,500	720	1.00	0.04
ø 3	21,800	1,440	3.00	0.09	17,300	1160	1.50	0.06	11,500	720	1.50	0.06
ø 4	16,700	1,500	4.00	0.12	13,200	1200	2.00	0.08	8,800	750	2.00	0.08
ø 5	15,700	1,740	5.00	0.15	12,500	1380	2.50	0.10	8,300	850	2.50	0.10
ø 6	13,100	1,620	6.00	0.18	10,350	1320	3.00	0.12	6,900	830	3.00	0.12
ø 8	9,880	1,584	8.00	0.24	7,800	1230	4.00	0.16	5,200	760	4.00	0.16
ø 10	7,800	1,440	10.00	0.30	6,150	1160	5.00	0.20	4,100	700	5.00	0.20
ø 12	6,650	1,440	12.00	0.36	5,250	1160	6.00	0.24	3,500	700	6.00	0.24
ø 16	5,540	1,200	16.00	0.39	4,340	1055	8.00	0.32	2,600	630	8.00	0.32

절입량 Depth of Cut



- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭 조건표는 2날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- The parameters on the table is based on 2flutes. For using 4flutes, use the same RPM and raise up the feed up to 30% 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, or found red heat on the material, 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㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

3NSE/4NSE

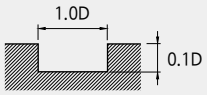
■ 4NSE는 RPM 동일, FEED만 최대 50% Up 적용.
■ Use the same RPM and raise up the feed up to 50% for 4NSE.

• RPM : rev./min • Feed : mm/min

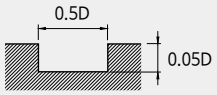
홈절삭 Slotting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM/HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 1	13,000	75	1	0.03	9,000	65	0.50	0.02	5,700	41	0.05	0.50
ø 1.5	10,000	75	2	0.045	6,000	65	0.75	0.03	4,500	41	0.08	0.75
ø 2	6,400	188	2	0.06	4,800	162	1.00	0.04	3,000	102	0.10	1.00
ø 3	4,200	375	3	0.09	3,400	324	1.50	0.06	2,100	204	0.15	1.50
ø 4	3,400	413	4	0.12	2,700	356	2.00	0.08	1,700	204	0.20	2.00
ø 5	2,900	563	5	0.15	2,300	486	2.50	0.10	1,500	306	0.25	2.50
ø 6	2,500	788	6	0.18	2,000	680	3.00	0.12	1,300	428	0.30	3.00
ø 8	1,900	813	8	0.24	1,500	702	4.00	0.16	1,000	442	0.40	4.00
ø 10	1,600	750	10	0.3	1,300	648	5.00	0.20	800	408	0.50	5.00
ø 12	1,300	731	12	0.36	1,100	632	6.00	0.24	670	398	0.60	6.00

절입량 Depth of Cut



~ 40HRC

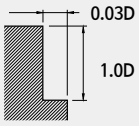


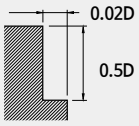
40HRC ~

측면절삭 Side Cutting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM/HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 50HRc				50 ~ 52HRc			
외경 Outside Diameter	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 1	13,000	75	1	0.030	9,000	65	0.5	0.02	5,700	49	0.50	0.02
ø 1.5	10,000	75	2	0.045	6,000	65	0.75	0.03	4,500	49	0.75	0.03
ø 2	6,400	188	2	0.060	4,800	162	1.00	0.04	3,000	122	1.00	0.04
ø 3	4,200	375	3	0.090	3,400	324	1.50	0.06	2,100	245	1.50	0.06
ø 4	3,400	413	4	0.120	2,700	356	2.00	0.08	1,700	269	2.00	0.08
ø 5	2,900	563	5	0.150	2,300	486	2.50	0.10	1,500	367	2.50	0.10
ø 6	2,500	788	6	0.180	2,000	680	3.00	0.12	1,300	514	3.00	0.12
ø 8	1,900	813	8	0.240	1,500	702	4.00	0.16	1,000	530	4.00	0.16
ø 10	1,600	750	10	0.300	1,300	648	5.00	0.20	800	490	5.00	0.20
ø 12	1,300	731	12	0.360	1,100	632	6.00	0.24	670	477	6.00	0.24

절입량 Depth of Cut

~ 40HRC 

40HRC ~ 

- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC55 이상 고경도강 가공시 같은 직경 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭 조건표는 3날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 50%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

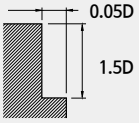
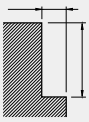
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 55 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- The parameters on the table is based on 3flutes. For using 4flutes, use the same RPM and raise up the feed up to 50% 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4HEME Cutting Condition

• RPM : rev./min • Feed : mm/min

측면절삭 Side Cutting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 1	40,000	432	1.5	0.050	40,000	396	0.5	0.03	40,000	277	0.50	0.03
ø 1.5	40,000	540	2.3	0.075	40,000	450	0.75	0.05	38,500	315	0.75	0.05
ø 2	40,000	720	3.0	0.100	38,000	648	1.00	0.06	36,500	450	1.00	0.06
ø 3	38,400	1,643	4.5	0.150	34,560	1,476	1.50	0.09	27,650	1,035	1.50	0.09
ø 4	28,800	1,899	6.0	0.200	25,920	1,710	2.00	0.12	20,730	1,197	2.00	0.12
ø 5	24,000	2,160	7.5	0.250	21,600	1,944	2.50	0.15	17,280	1,359	2.50	0.15
ø 6	19,200	2,507	9.0	0.300	17,280	2,255	2.50	0.18	13,820	1,575	2.50	0.18
ø 8	14,400	2,507	12.0	0.400	12,960	2,255	3.00	0.24	10,370	1,575	3.00	0.24
ø 10	11,520	2,507	15.0	0.500	10,360	2,255	4.00	0.30	8,290	1,575	4.00	0.30
ø 12	9,600	2,070	18.0	0.600	8,640	1,863	6.00	0.36	6,900	1,305	6.00	0.36
ø 14	8,950	1,859	21.0	0.700	8,140	1,683	7.00	0.42	6,120	1,107	7.00	0.42
ø 16	7,200	1,557	24.0	0.800	6,480	1,400	8.00	0.48	5,190	981	8.00	0.48

절입량 Depth of Cut	~ 40HRC  0.05D 1.5D	40HRC ~  0.03D 0.5D

- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 길게 체결할시 회전수와 피드를 같은 비율로 DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이며 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If you clamp the endmill with long overhang of effective length, reduce the RPM and feed in the same proportion.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

2NCRE/4NCRE

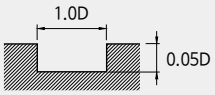
■ 4NCRE는 RPM 동일, FEED만 최대30% Up 적용.
■ Use the same RPM and raise up the feed up to 30% for 4NCRE.

• RPM : rev./min • Feed : mm/min

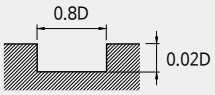
홈절삭 Slotting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM/HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 1	43,200	1,224	0.05	1.0	24,200	990	0.02	0.8	22,950	660	0.02	0.80
ø 1.5	28,250	1,296	0.08	1.5	23,850	1,090	0.03	1.2	20,340	726	0.03	1.20
ø 2	29,970	1,458	0.10	2.0	15,570	1,200	0.04	1.6	15,750	776	0.04	1.60
ø 3	19,620	1,482	0.15	3.0	11,880	1,230	0.06	2.4	10,350	792	0.06	2.40
ø 4	15,030	1,518	0.20	4.0	11,250	1,310	0.08	3.2	7,920	809	0.08	3.20
ø 5	14,130	1,620	0.25	5.0	9,315	1,280	0.10	4.0	7,470	858	0.10	4.00
ø 6	11,790	1,578	0.30	6.0	7,020	1,170	0.12	4.8	6,210	842	0.12	4.80
ø 8	8,890	1,440	0.40	8.0	5,530	1,090	0.16	6.4	4,680	776	0.16	6.40
ø 10	7,020	1,344	0.50	10.0	4,720	1,090	0.20	8.0	3,690	726	0.20	8.00
ø 12	5,985	1,344	0.60	12.0	4,350	1,050	0.24	9.6	3,150	726	0.24	9.60

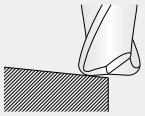
절입량 Depth of Cut



~ 40HRC



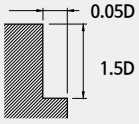
40HRC ~


경사진면절삭 Inclined Cutting

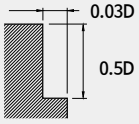
측면절삭 Side Cutting

피삭재 Material	공구강/금형강 Tool steels / Mold steels SCM/HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 1	43,200	870	1.5	0.050	34,200	702	0.5	0.03	22,950	470	0.50	0.03
ø 1.5	37,080	980	2.3	0.075	29,250	801	0.75	0.05	19,350	550	0.75	0.05
ø 2	29,970	1,280	3.0	0.100	23,400	1,035	1.00	0.06	15,750	690	1.00	0.06
ø 3	19,620	1,300	4.5	0.150	15,570	1,062	1.50	0.09	13,500	700	1.50	0.09
ø 4	15,030	1,330	6.0	0.200	11,880	1,080	2.00	0.12	7,920	720	2.00	0.12
ø 5	14,130	1,550	7.5	0.250	11,250	1,260	2.50	0.15	7,470	840	2.50	0.15
ø 6	11,790	1,440	9.0	0.300	9,310	1,170	2.50	0.18	6,210	780	2.50	0.18
ø 8	8,890	1,410	12.0	0.400	7,020	1,143	3.00	0.24	4,680	760	3.00	0.24
ø 10	7,020	1,280	15.0	0.500	5,530	1,035	4.00	0.30	3,690	690	4.00	0.30
ø 12	5,980	1,280	18.0	0.600	4,720	1,035	6.00	0.36	3,150	690	6.00	0.36

절입량 Depth of Cut



~ 40HRC



40HRC ~

- 상기 절삭조건표는 2날 기준이며, 4날시 회전수는 유지하고 피드는 안정적인 속도 내에서 최대30%까지 UP 해주십시오.
- HRC52 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이며 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 피삭재와 절삭형상을 위한 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

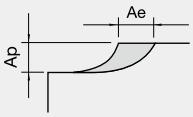
- The parameters on the table is based on 2 flutes. For using 4 flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use the adequate coolant for work material and machining geometry and note for heat and ignition.

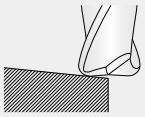
4RCUE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		공구강/금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness		30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	반경 Corner 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
ø 1	R0.2	40,500	4,361	0.02	0.40	37,800	4,858	0.02	0.30	31,500	3,207	0.02	0.30
ø 1.5	R0.5	36,000	5,607	0.03	0.60	36,000	4,984	0.02	0.45	27,000	3,302	0.02	0.45
ø 2	R0.5	29,700	6,230	0.04	0.80	24,300	5,236	0.03	0.60	21,600	3,535	0.03	0.60
ø 3	R0.5	19,800	6,853	0.06	1.20	16,200	5,607	0.05	0.90	14,400	4,007	0.05	0.90
ø 4	R0.5	17,100	8,099	0.08	1.60	14,400	6,230	0.06	1.20	11,700	4,717	0.06	1.20
〃	R1.0	15,300	7,476	0.08	1.60	12,600	5,915	0.06	1.20	10,800	4,150	0.06	1.20
ø 5	R0.5	13,500	8,722	0.10	2.00	10,800	7,476	0.08	1.50	9,900	4,717	0.08	1.50
〃	R1.0	11,700	8,099	0.10	2.00	9,900	6,853	0.08	1.50	8,640	4,479	0.08	1.50
ø 6	R0.5	11,680	9,555	0.12	2.40	9,540	8,099	0.09	1.80	8,550	5,660	0.09	1.80
〃	R1.0	11,340	7,847	0.12	2.40	8,930	7,476	0.09	1.80	8,100	5,189	0.09	1.80
〃	R1.5	9,900	8,099	0.12	2.40	8,100	6,853	0.09	1.80	7,200	4,526	0.09	1.80
ø 8	R0.5	7,920	10,249	0.16	3.20	7,380	7,882	0.12	2.40	6,390	6,132	0.12	2.40
〃	R1.0	7,560	9,345	0.16	3.20	7,200	7,672	0.12	2.40	6,030	5,189	0.12	2.40
〃	R2.0	7,380	8,099	0.16	3.20	6,300	6,853	0.12	2.40	5,400	4,526	0.12	2.40
ø 10	R0.5	6,730	9,310	0.20	4.00	5,700	7,882	0.15	3.00	4,970	5,152	0.15	3.00
〃	R1.0	6,550	9,072	0.20	4.00	5,540	7,672	0.15	3.00	4,840	5,019	0.15	3.00
〃	R2.0	5,850	8,099	0.20	4.00	4,950	6,853	0.15	3.00	4,320	4,479	0.15	3.00
ø 12	R0.5	6,300	9,345	0.24	4.80	4,880	7,351	0.18	3.60	4,350	5,009	0.18	3.60
〃	R1.0	5,760	8,722	0.24	4.80	4,760	7,161	0.18	3.60	4,240	4,881	0.18	3.60
〃	R2.0	5,400	7,784	0.24	4.80	4,640	6,979	0.18	3.60	4,130	4,754	0.18	3.60
〃	R3.0	4,950	7,476	0.24	4.80	4,140	6,230	0.18	3.60	3,690	4,245	0.18	3.60

절입량 Depth of Cut





경사진면절삭 Inclined Cutting

■ Coefficients respective of tool overhang

Type	Overhang	Revolution	Feed rate	Depth of Cut ap
Straight	L/D ≦ 5	100%	100%	100%
	L/D = 6	90%	80%	80%
	L/D = 7	80%	70%	70%
Taper neck	L/D = 6	100%	100%	100%
	L/D = 8	90%	80%	80%
	L/D ≧ 10	80%	70%	70%

- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 측면 절삭시 코너R 참고하여 절삭 하시기 바랍니다.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 유효장 길이가 긴 경우, 위 표와같이 RPM과 FEED를 낮춰주세요.
- 절입깊이가 얕은 경우, RPM과 FEED를 증가해주세요
- 원활한 칩배출을 위하여 에어브로우나 오일 미스트를 추천합니다.

- If the effective length is long, reduce the RPM and feed maximum 30%.
- For side milling, refer to the corner radius value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% 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.
- If the effective length is long, refer to the table (Coefficients respective of tool overhang) and adjust the RPM and feed.
- If you use small value of Ap, raise up the RPM and feed.
- Air blow or oil mist is recommended for smooth chip emission.

2HRBG Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		동 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc			
반경 Radius	유효장 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
R0.05	—	54,000	85	0.004	0.004	48,000	75	0.004	0.004	48,000	55	0.002	0.002
	0.5	54,000	430	0.010	0.010	48,000	350	0.006	0.007	48,000	280	0.006	0.007
R0.1	1	54,000	380	0.008	0.008	48,000	330	0.005	0.005	48,000	250	0.005	0.005
	1.5	47,000	320	0.006	0.006	47,000	250	0.004	0.004	47,000	200	0.004	0.004
	2	42,000	290	0.004	0.004	42,000	200	0.003	0.003	42,000	200	0.003	0.003
	1.5	54,000	640	0.014	0.015	48,000	480	0.010	0.010	41,000	370	0.009	0.010
	2	49,000	530	0.011	0.011	43,000	370	0.008	0.008	37,000	270	0.008	0.008
R0.15	3	43,000	460	0.009	0.010	38,000	320	0.007	0.006	32,000	240	0.006	0.006
	4	37,000	300	0.004	0.006	28,000	200	0.003	0.004	24,000	160	0.003	0.004
	5	31,000	200	0.002	0.004	26,000	125	0.001	0.003	18,000	110	0.002	0.003
	1	54,000	870	0.023	0.036	48,000	660	0.018	0.024	37,000	450	0.015	0.024
	2	54,000	790	0.022	0.036	48,000	590	0.018	0.024	37,000	400	0.015	0.020
	3	50,000	660	0.017	0.018	41,000	420	0.012	0.012	31,000	280	0.011	0.012
R0.2	4	50,000	640	0.012	0.018	38,000	400	0.009	0.012	30,000	270	0.009	0.012
	5	37,000	410	0.009	0.018	29,000	330	0.008	0.012	26,000	260	0.007	0.012
	6	37,000	360	0.006	0.010	29,000	260	0.005	0.006	26,000	200	0.004	0.006
	8	27,000	200	0.003	0.006	27,000	170	0.003	0.003	23,000	150	0.002	0.003
	10	20,000	110	0.002	0.004	25,000	110	0.002	0.002	20,000	110	0.001	0.002
	1	57,000	1,380	0.029	0.054	42,000	830	0.023	0.036	32,000	550	0.018	0.036
	2	57,000	1,250	0.028	0.054	42,000	750	0.022	0.036	32,000	500	0.018	0.036
	3	55,000	1,010	0.021	0.036	38,000	580	0.017	0.024	31,000	400	0.014	0.024
	4	55,000	1,010	0.021	0.036	38,000	580	0.017	0.024	31,000	400	0.014	0.024
R0.25	5	48,000	800	0.016	0.018	33,000	480	0.012	0.012	30,000	390	0.009	0.012
	6	36,000	610	0.009	0.018	28,000	400	0.008	0.012	27,000	330	0.005	0.012
	8	36,000	590	0.009	0.018	28,000	400	0.008	0.012	27,000	330	0.005	0.012
	10	36,000	460	0.009	0.018	28,000	400	0.008	0.012	27,000	330	0.005	0.012
	12	24,000	280	0.004	0.010	26,000	280	0.004	0.006	24,000	280	0.002	0.006
	14	16,000	170	0.001	0.006	24,000	200	0.002	0.003	21,000	240	0.001	0.003
	1	57,000	1,670	0.035	0.144	37,000	840	0.027	0.096	27,000	540	0.023	0.096
	2	57,000	1,540	0.034	0.144	37,000	770	0.027	0.096	27,000	500	0.021	0.096
	3	57,000	1,540	0.034	0.144	37,000	770	0.027	0.096	27,000	500	0.021	0.096
	4	54,000	1,130	0.026	0.108	35,000	600	0.020	0.072	26,000	380	0.016	0.072
	5	46,000	960	0.019	0.072	28,000	460	0.016	0.048	26,000	370	0.012	0.048
R0.3	6	46,000	960	0.019	0.072	28,000	460	0.016	0.048	26,000	370	0.012	0.048
	8	30,000	570	0.010	0.054	24,000	400	0.009	0.036	23,000	320	0.006	0.036
	10	30,000	490	0.007	0.036	24,000	330	0.006	0.024	23,000	290	0.004	0.024
	12	30,000	490	0.007	0.036	24,000	330	0.006	0.024	23,000	290	0.004	0.024
	14	20,000	300	0.004	0.027	22,000	300	0.004	0.018	20,000	250	0.002	0.018
	16	13,000	180	0.002	0.020	21,000	260	0.002	0.014	18,000	220	0.001	0.014
	2	56,000	1,800	0.050	0.162	35,000	740	0.039	0.108	27,000	500	0.031	0.108
	4	54,500	1,500	0.045	0.063	33,000	600	0.035	0.062	26,500	410	0.029	0.096
R0.35	8	32,000	800	0.019	0.072	25,000	420	0.020	0.048	22,500	355	0.012	0.048
	10	26,500	540	0.017	0.063	22,500	380	0.014	0.042	21,500	330	0.011	0.042
	12	23,000	420	0.017	0.063	21,500	380	0.012	0.032	21,500	320	0.010	0.042
	2	55,000	2,060	0.063	0.180	33,000	710	0.050	0.120	27,000	500	0.041	0.120
	4	55,000	1,860	0.063	0.180	31,000	600	0.050	0.120	27,000	440	0.041	0.120
	6	47,000	1,410	0.038	0.108	28,000	570	0.030	0.072	22,000	390	0.024	0.072
R0.4	8	34,000	1,040	0.027	0.090	21,000	430	0.021	0.060	22,000	390	0.018	0.060
	10	23,000	600	0.027	0.090	21,000	430	0.021	0.060	20,000	370	0.017	0.060
	12	16,000	350	0.027	0.090	19,000	430	0.018	0.040	20,000	350	0.016	0.060
	14	11,000	200	0.027	0.090	19,000	430	0.015	0.027	20,000	330	0.015	0.060
	16	7,600	115	0.027	0.090	16,000	430	0.013	0.018	20,000	310	0.014	0.060
R0.45	4	50,500	1,900	0.067	0.190	32,000	685	0.054	0.130	24,500	460	0.043	0.180
	2	46,000	2,000	0.072	0.360	32,000	770	0.057	0.240	22,000	480	0.045	0.240
	3	46,000	2,000	0.072	0.360	32,000	770	0.057	0.240	22,000	480	0.045	0.240
	4	46,000	2,000	0.071	0.360	32,000	770	0.057	0.240	22,000	480	0.045	0.240
	5	46,000	2,000	0.071	0.360	32,000	770	0.057	0.240	22,000	480	0.045	0.240
	6	39,000	1,500	0.071	0.180	26,000	760	0.055	0.120	17,600	480	0.035	0.120
	8	39,000	1,500	0.043	0.180	26,000	760	0.034	0.120	17,600	480	0.027	0.120
R0.5	10	29,000	1,110	0.028	0.090	17,600	530	0.024	0.060	16,500	420	0.018	0.060
	12	18,700	660	0.027	0.090	17,600	530	0.024	0.060	16,500	420	0.018	0.060
	14	18,700	640	0.022	0.090	15,400	440	0.018	0.060	14,300	360	0.014	0.060
	16	18,700	640	0.022	0.090	15,400	440	0.018	0.060	14,300	360	0.014	0.060
	18	18,700	540	0.017	0.090	14,300	440	0.013	0.060	13,200	360	0.009	0.060
	20	18,700	540	0.017	0.054	14,300	360	0.013	0.036	13,200	300	0.009	0.036
	22	18,700	540	0.017	0.054	14,300	360	0.013	0.036	13,200	300	0.009	0.036
	25	18,700	540	0.016	0.052	14,300	360	0.013	0.030	13,200	300	0.009	0.030

2HRBG Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc			
반경 Radius	유효장 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
	4	38,000	2,000	0.085	0.360	26,000	770	0.068	0.240	18,200	480	0.054	0.240
	6	38,000	2,000	0.085	0.360	26,000	770	0.068	0.240	18,200	480	0.054	0.240
	8	32,000	1,490	0.084	0.360	21,000	700	0.067	0.240	15,100	440	0.054	0.240
R0.6	10	24,000	1,080	0.036	0.180	16,400	530	0.027	0.120	15,100	420	0.022	0.120
	12	24,000	1,080	0.036	0.180	15,300	530	0.027	0.120	14,100	420	0.022	0.120
	16	15,400	580	0.024	0.144	13,100	460	0.019	0.096	11,900	380	0.016	0.096
	20	15,400	580	0.017	0.090	12,100	380	0.013	0.060	11,000	320	0.009	0.060
	24	15,400	580	0.010	0.060	11,100	320	0.009	0.040	9,800	290	0.007	0.040
	6	28,000	1,470	0.099	0.270	17,600	680	0.076	0.180	13,600	440	0.063	0.180
R0.7	8	28,000	1,470	0.099	0.270	17,600	680	0.079	0.180	13,600	440	0.063	0.180
	12	19,800	1,080	0.042	0.270	13,800	530	0.033	0.180	13,600	420	0.027	0.180
	16	13,200	620	0.033	0.180	13,100	480	0.027	0.120	11,900	390	0.021	0.120
	3	30,000	2,200	0.171	0.324	21,000	1060	0.137	0.216	14,800	660	0.110	0.216
	4	30,000	2,200	0.171	0.324	21,000	1060	0.137	0.216	14,800	660	0.110	0.216
	6	30,000	1,980	0.147	0.324	21,000	940	0.117	0.216	14,800	580	0.090	0.216
	8	26,000	1,500	0.106	0.270	16,300	700	0.084	0.180	12,100	450	0.069	0.180
	10	26,000	1,500	0.106	0.270	16,300	700	0.084	0.180	12,100	450	0.069	0.180
	12	26,000	1,500	0.106	0.270	16,300	700	0.084	0.180	12,100	450	0.069	0.180
R0.75	14	18,700	1,100	0.045	0.180	12,600	530	0.036	0.120	12,100	440	0.027	0.120
	16	12,100	620	0.036	0.180	12,400	480	0.027	0.120	11,600	390	0.022	0.120
	18	12,100	620	0.036	0.180	12,400	480	0.027	0.120	11,600	390	0.022	0.120
	20	12,100	620	0.019	0.090	12,400	480	0.016	0.060	11,600	390	0.012	0.060
	22	12,100	620	0.019	0.090	12,400	480	0.016	0.060	11,000	390	0.012	0.060
	25	11,000	500	0.019	0.090	12,400	440	0.016	0.060	11,000	390	0.012	0.060
	30	10,700	450	0.019	0.090	10,900	400	0.016	0.060	11,000	390	0.012	0.060
	35	10,700	410	0.019	0.090	9,000	380	0.016	0.060	11,000	390	0.012	0.060
	6	27,040	2,600	0.220	0.580	18,900	1200	0.180	0.390	16,500	760	0.150	0.390
	8	26,000	1,970	0.157	0.324	18,900	940	0.126	0.216	13,800	580	0.102	0.216
R0.8	12	25,000	1,490	0.112	0.180	15,100	700	0.090	0.120	11,500	440	0.072	0.120
	16	17,600	1,100	0.046	0.144	12,300	530	0.036	0.096	11,400	440	0.030	0.096
	20	11,000	630	0.036	0.090	11,500	480	0.030	0.060	10,900	400	0.024	0.060
	6	32,000	2,600	0.230	0.210	18,400	1200	0.185	0.320	18,400	738	0.150	0.320
	8	26,000	1,950	0.165	0.270	16,300	930	0.132	0.240	13,800	570	0.108	0.240
R0.9	12	21,000	1,480	0.120	0.270	13,800	700	0.094	0.180	10,300	440	0.077	0.180
	16	15,400	1,080	0.048	0.180	10,800	530	0.039	0.120	9,900	420	0.031	0.120
	20	10,500	630	0.039	0.090	10,200	480	0.031	0.060	9,700	400	0.025	0.060
	4	22,000	2,140	0.232	0.540	18,500	1260	0.185	0.360	13,200	960	0.150	0.360
	6	22,000	2,140	0.232	0.540	18,500	1260	0.185	0.360	13,200	960	0.150	0.360
	8	22,000	1,920	0.185	0.360	18,500	1120	0.147	0.240	13,200	870	0.120	0.240
	10	22,000	1,920	0.185	0.360	18,500	1120	0.147	0.240	13,200	870	0.120	0.240
	12	18,700	1,470	0.166	0.360	16,000	990	0.133	0.240	11,700	780	0.107	0.240
	14	18,700	1,470	0.166	0.360	16,000	990	0.133	0.240	11,700	780	0.107	0.240
	16	18,700	1,470	0.148	0.360	16,000	990	0.118	0.240	11,700	780	0.090	0.240
R1	18	14,300	1,070	0.093	0.180	14,700	580	0.074	0.120	11,600	580	0.061	0.120
	20	14,300	1,070	0.093	0.180	14,700	580	0.074	0.120	11,600	580	0.061	0.120
	22	9,500	630	0.074	0.180	10,600	450	0.058	0.120	10,200	450	0.045	0.120
	25	9,500	630	0.074	0.180	10,600	450	0.058	0.120	10,200	450	0.045	0.120
	30	9,500	530	0.033	0.090	10,600	450	0.026	0.060	10,200	380	0.021	0.060
	35	9,500	530	0.026	0.090	10,600	380	0.019	0.060	10,200	380	0.017	0.060
	40	9,500	530	0.026	0.090	10,600	380	0.019	0.060	10,200	380	0.017	0.060
	45	9,500	445	0.011	0.045	10,000	380	0.009	0.030	10,200	320	0.008	0.030
	8	18,400	2,400	0.232	0.360	14,500	1400	0.185	0.240	9,700	1080	0.150	0.240
	10	18,400	2,400	0.232	0.360	14,500	1400	0.185	0.240	9,700	1080	0.150	0.240
	16	16,100	1,810	0.208	0.360	13,500	1230	0.166	0.240	8,400	980	0.135	0.240
R1.25	20	11,500	1,330	0.116	0.180	10,200	950	0.093	0.120	8,400	980	0.074	0.120
	25	6,900	770	0.093	0.180	8,400	540	0.074	0.120	8,400	560	0.061	0.120
	30	6,900	770	0.040	0.090	8,400	540	0.033	0.060	8,400	560	0.026	0.060
	35	6,900	770	0.018	0.050	8,400	540	0.015	0.030	8,400	560	0.011	0.030
	6	15,000	2,890	0.278	0.540	12,900	1680	0.222	0.360	9,200	1300	0.180	0.360
	8	15,000	2,890	0.278	0.540	12,900	1680	0.222	0.360	9,200	1300	0.180	0.360
	10	15,000	2,600	0.278	0.540	12,900	1680	0.222	0.360	9,200	1300	0.180	0.360
	12	15,000	2,600	0.278	0.540	12,900	1510	0.222	0.360	9,200	1170	0.180	0.360
R1.5	16	12,700	1,970	0.290	0.504	11,300	1330	0.166	0.360	8,100	1040	0.135	0.360
	20	12,700	1,970	0.290	0.504	11,300	1330	0.166	0.360	8,100	1040	0.135	0.360
	25	10,100	1,450	0.139	0.270	8,800	1040	0.111	0.180	8,100	1040	0.090	0.180
	30	10,100	1,450	0.139	0.270	8,800	780	0.111	0.180	8,100	780	0.090	0.180
	35	6,600	840	0.073	0.270	7,900	620	0.055	0.180	7,500	650	0.045	0.180

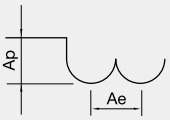
2HRBG Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc			
반경 Radius	유효장 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
	40	6,600	840	0.073	0.270	7,900	620	0.055	0.180	7,500	520	0.045	0.180
R1.5	45	4,500	500	0.040	0.270	6,200	500	0.035	0.100	7,000	450	0.023	0.180
	50	4,300	490	0.040	0.270	6,200	500	0.030	0.090	7,000	350	0.023	0.180
	60	3,700	420	0.034	0.160	5,900	450	0.030	0.080	6,000	300	0.020	0.150
	8	11,500	2,710	0.370	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
	10	11,500	2,710	0.370	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
	12	11,500	2,710	0.390	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
	16	11,500	2,710	0.390	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
	20	11,500	2,710	0.390	0.900	9,700	1560	0.297	0.600	6,800	1210	0.241	0.600
	25	10,300	1,850	0.279	0.540	8,400	1250	0.223	0.360	6,000	980	0.180	0.360
R2	30	10,300	1,850	0.279	0.540	8,400	1250	0.223	0.360	6,000	980	0.180	0.361
	35	7,500	1,360	0.185	0.540	6,600	950	0.148	0.360	6,000	700	0.120	0.360
	40	7,500	1,360	0.185	0.540	6,600	950	0.148	0.360	6,000	700	0.120	0.360
	45	5,000	780	0.093	0.360	5,900	470	0.074	0.240	5,600	490	0.060	0.240
	50	5,000	780	0.093	0.360	5,900	470	0.074	0.240	5,600	490	0.060	0.240
	55	4,500	640	0.090	0.330	5,200	375	0.068	0.225	5,400	370	0.050	0.251
	60	4,000	500	0.078	0.300	5,000	280	0.062	0.210	5,200	250	0.040	0.180
	15	9,600	2,590	0.406	0.900	7,800	1350	0.324	0.800	5,600	1050	0.252	0.800
	20	9,600	2,100	0.406	0.900	7,800	1240	0.324	0.600	5,600	950	0.252	0.600
	25	9,600	2,100	0.406	0.900	7,800	1240	0.324	0.600	5,600	950	0.252	0.600
R2.5	30	8,200	1,320	0.305	0.900	7,800	760	0.243	0.600	4,800	600	0.197	0.600
	40	7,000	830	0.230	0.900	7,800	470	0.200	0.600	4,300	380	0.154	0.600
	45	5,000	520	0.173	0.900	6,800	290	0.165	0.600	3,900	240	0.120	0.600
	50	4,500	330	0.131	0.900	6,800	180	0.135	0.600	3,500	150	0.094	0.600
	60	4,000	300	0.099	0.800	6,800	110	0.112	0.600	3,300	100	0.074	0.600
R3	15	8,000	2,530	0.555	1.800	7,400	2088	0.443	1.200	5,200	1300	0.360	1.200
	30	8,000	1,810	0.418	1.080	7,400	1875	0.334	0.720	4,600	1170	0.270	0.720
R4	25	9,000	2,400	0.600	1.500	7,200	1500	0.500	1.000	5,200	920	0.350	1.000
	30	7,700	1,500	0.450	1.200	7,200	925	0.380	0.800	4,500	580	0.300	0.800
R5	30	7,800	1,300	0.300	0.900	6,800	900	0.230	0.600	4,600	570	0.190	0.570
	35	7,125	1,292	0.176	0.513	6,800	860	0.140	0.340	5,700	665	0.110	0.340
R6	30	7,410	1,235	0.285	0.855	6,350	855	0.210	0.570	4,370	541	0.181	0.550
	40	6,800	1,100	0.260	0.780	6,350	788	0.200	0.520	4,020	500	0.160	0.500

절입량 Depth of Cut

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



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 절삭조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛ 이내 일것.)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- 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 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- 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㎛).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.

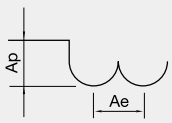
2HSBG/2HCBG Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc			
반경 Radius	유효장 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
R0.05	0.2	54,000	360	0.010	0.050	43,200	306	0.009	0.045	34,560	245	0.007	0.036
R0.075	0.15	54,000	456	0.010	0.030	43,200	388	0.009	0.027	34,560	310	0.007	0.022
R0.1	0.2	54,000	516	0.012	0.008	43,200	439	0.011	0.007	34,560	351	0.009	0.006
	0.4	54,000	516	0.005	0.008	43,200	439	0.005	0.007	34,560	351	0.004	0.006
R0.1.5	0.3	54,000	864	0.020	0.013	43,200	734	0.018	0.012	34,560	588	0.014	0.009
	0.6	54,000	864	0.010	0.013	43,200	734	0.009	0.012	34,560	588	0.007	0.009
R0.2	0.4	54,000	1,044	0.028	0.016	43,200	887	0.025	0.014	34,560	710	0.020	0.012
	0.8	54,000	1,044	0.014	0.016	43,200	887	0.013	0.014	34,560	710	0.010	0.012
R0.25	0.5	56,000	1,500	0.035	0.022	44,800	1,275	0.032	0.020	35,840	1,020	0.025	0.016
R0.3	0.6	58,000	1,812	0.042	0.026	46,400	1,540	0.038	0.023	37,120	1,232	0.030	0.019
R0.35	0.7	55,000	2,028	0.049	0.031	44,000	1,724	0.044	0.028	35,200	1,379	0.035	0.022
R0.4	0.8	52,000	2,244	0.056	0.036	41,600	1,907	0.050	0.032	33,280	1,526	0.040	0.026
	2	52,000	2,244	0.033	0.036	41,600	1,907	0.015	0.032	33,280	1,526	0.012	0.026
R0.5	1	41,000	1,992	0.063	0.040	32,800	1,693	0.057	0.036	26,240	1,355	0.045	0.029
	2.5	41,000	1,992	0.022	0.040	32,800	1,693	0.020	0.036	26,240	1,355	0.016	0.029
R0.6	3	34,000	2,088	0.065	0.040	27,200	1,775	0.059	0.036	21,760	1,420	0.047	0.029
R0.75	1.5	27,000	2,196	0.087	0.068	21,600	1,867	0.078	0.061	17,280	1,493	0.063	0.049
	4	27,000	2,196	0.052	0.068	21,600	1,867	0.047	0.061	17,280	1,493	0.037	0.049
R1	2	20,000	2,136	0.112	0.089	16,000	1,816	0.101	0.080	12,800	1,452	0.081	0.064
	5	20,000	2,136	0.070	0.091	16,000	1,816	0.063	0.082	12,800	1,452	0.050	0.066
R1.25	6	16,000	2,208	0.067	0.115	12,800	1,877	0.060	0.104	10,240	1,501	0.048	0.083
R1.5	3	13,000	2,664	0.197	0.171	10,400	2,264	0.177	0.154	8,320	1,812	0.142	0.123
	8	13,000	2,664	0.100	0.171	10,400	2,264	0.090	0.154	8,320	1,812	0.072	0.123
R1.75	8	11,500	2,580	0.183	0.190	9,200	2,193	0.165	0.171	7,360	1,754	0.132	0.136
R2	4	10,000	2,496	0.266	0.208	8,000	2,122	0.239	0.187	6,400	1,697	0.192	0.150
	8	10,000	2,496	0.134	0.208	8,000	2,122	0.121	0.187	6,400	1,697	0.096	0.150
R2.5	5	8,300	2,388	0.215	0.240	6,640	2,030	0.194	0.216	5,312	1,624	0.155	0.173
	8	8,300	2,388	0.200	0.240	6,640	2,030	0.180	0.216	5,312	1,624	0.144	0.173
	10	8,300	2,388	0.190	0.240	6,640	2,030	0.171	0.216	5,312	1,624	0.137	0.173
R3	6	6,900	2,328	0.290	0.281	5,520	1,979	0.261	0.253	4,416	1,583	0.209	0.202
	10	6,900	2,328	0.250	0.281	5,520	1,979	0.225	0.253	4,416	1,583	0.180	0.202
	12	6,900	2,328	0.230	0.281	5,520	1,979	0.207	0.253	4,416	1,583	0.166	0.202
R3.5	14	6,310	2,200	0.315	0.228	5,048	1,499	0.284	0.205	4,038	1,200	0.227	0.164
R4	8	5,720	2,000	0.400	0.175	4,576	1,020	0.360	0.158	3,661	816	0.288	0.126
	14	5,720	2,188	0.400	0.175	4,576	1,020	0.360	0.158	3,661	816	0.288	0.126
R4.5	16	5,135	2,125	0.450	0.165	4,108	867	0.405	0.148	3,286	694	0.324	0.118
R5	10	4,550	2,063	0.500	0.154	3,640	714	0.450	0.139	2,912	571	0.360	0.111
	15	4,550	2,063	0.500	0.154	3,640	714	0.450	0.139	2,912	571	0.360	0.111
	18	4,550	2,063	0.500	0.154	3,640	714	0.450	0.139	2,912	571	0.360	0.111
R5.5	20	4,160	1,950	0.550	0.157	3,328	663	0.495	0.141	2,662	530	0.396	0.113
R6	18	3,770	1,925	0.600	0.159	3,016	612	0.540	0.143	2,413	490	0.432	0.114
	22	3,770	1,875	0.600	0.159	3,016	612	0.540	0.143	2,413	490	0.432	0.114
R6.5	24	3,728	1,850	0.549	0.156	2,982	666	0.494	0.140	2,386	533	0.395	0.112
R7	24	3,686	1,788	0.498	0.153	2,948	720	0.448	0.137	2,359	576	0.359	0.110
R8	30	2,985	1,750	0.413	0.147	2,388	612	0.372	0.132	1,911	490	0.298	0.106
R10	38	2,429	1,688	0.276	0.133	1,943	367	0.248	0.120	1,554	294	0.198	0.096

절입량 Depth of Cut

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



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2HREG Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 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 0.1	0.3	56,000	544	0.006	0.020	47,600	435	0.005	0.018	42,840	392	0.005	0.015
〃	0.5	50,900	464	0.005	0.016	43,265	371	0.005	0.014	38,939	334	0.004	0.012
ø 0.2	0.5	56,000	544	0.006	0.020	47,600	435	0.005	0.018	42,840	392	0.005	0.015
〃	1	50,900	464	0.005	0.016	43,265	371	0.005	0.014	38,939	334	0.004	0.012
〃	2	48,200	400	0.003	0.006	40,970	320	0.003	0.005	36,873	288	0.002	0.005
ø 0.3	1	60,000	896	0.009	0.101	51,000	717	0.008	0.091	45,900	645	0.007	0.077
〃	1.5	50,800	736	0.008	0.057	43,180	589	0.007	0.051	38,862	530	0.006	0.044
〃	2	41,500	560	0.006	0.013	35,275	448	0.005	0.012	31,748	403	0.005	0.010
〃	3	31,900	384	0.002	0.004	27,115	307	0.002	0.004	24,404	276	0.002	0.003
〃	4	26,200	272	0.001	0.003	22,270	218	0.001	0.003	20,043	196	0.001	0.002
〃	5	20,400	160	0.001	0.002	17,340	128	0.001	0.002	15,606	115	0.001	0.002
ø 0.4	1	52,700	1,056	0.012	0.054	44,795	845	0.011	0.049	40,316	760	0.009	0.041
〃	5	38,500	608	0.003	0.003	32,725	486	0.003	0.003	29,453	438	0.002	0.002
〃	10	33,700	416	0.001	0.001	28,645	333	0.001	0.001	25,781	300	0.001	0.001
ø 0.5	2	56,800	1,440	0.020	0.098	48,280	1,152	0.018	0.088	43,452	1,037	0.015	0.075
〃	3	44,200	1,056	0.009	0.016	37,570	845	0.008	0.014	33,813	760	0.007	0.012
〃	4	40,600	928	0.008	0.012	34,510	742	0.008	0.011	31,059	668	0.006	0.009
〃	5	37,000	800	0.008	0.008	31,450	640	0.007	0.007	28,305	576	0.006	0.006
〃	6	33,400	672	0.005	0.004	28,390	538	0.005	0.004	25,551	484	0.004	0.003
〃	8	29,100	512	0.002	0.002	24,735	410	0.002	0.002	22,262	369	0.002	0.002
〃	10	26,100	400	0.001	0.001	22,185	320	0.001	0.001	19,967	288	0.001	0.001
〃	14	21,500	192	0.001	0.001	18,275	154	0.001	0.001	16,448	138	0.001	0.001
ø 0.6	2	63,600	1,984	0.025	0.203	54,060	1,587	0.023	0.183	48,654	1,428	0.019	0.155
〃	3	52,500	1,584	0.018	0.114	44,625	1,267	0.016	0.103	40,163	1,140	0.014	0.087
〃	4	41,300	1,184	0.012	0.025	35,105	947	0.011	0.023	31,595	852	0.009	0.019
〃	5	36,700	1,008	0.010	0.017	31,195	806	0.009	0.015	28,076	726	0.008	0.013
〃	6	32,100	832	0.007	0.008	27,285	666	0.006	0.007	24,557	599	0.005	0.006
〃	8	26,800	624	0.004	0.003	22,780	499	0.004	0.003	20,502	449	0.003	0.002
〃	10	23,400	48	0.002	0.002	19,890	38	0.002	0.002	17,901	35	0.002	0.002
〃	12	20,900	384	0.002	0.001	17,765	307	0.002	0.001	15,989	276	0.002	0.001
〃	16	16,200	160	0.001	0.001	13,770	128	0.001	0.001	12,393	115	0.001	0.001
ø 0.7	2	59,800	2,208	0.030	0.055	50,830	1,766	0.027	0.050	45,747	1,590	0.023	0.042
〃	4	38,900	1,344	0.017	0.047	33,065	1,075	0.015	0.042	29,759	968	0.013	0.036
〃	6	30,200	960	0.010	0.014	25,670	768	0.009	0.013	23,103	691	0.008	0.011
〃	8	25,300	736	0.006	0.006	21,505	589	0.005	0.005	19,355	530	0.005	0.005
〃	10	22,000	576	0.004	0.003	18,700	461	0.004	0.003	16,830	415	0.003	0.002
ø 8	2	41,200	1,680	0.033	0.108	35,020	1,344	0.030	0.097	31,518	1,210	0.025	0.083
〃	4	37,100	1,488	0.027	0.08	31,535	1,190	0.024	0.072	28,382	1,071	0.021	0.061
〃	6	28,800	1,088	0.015	0.024	24,480	870	0.014	0.022	22,032	783	0.011	0.018
〃	8	24,100	832	0.009	0.01	20,485	666	0.008	0.009	18,437	599	0.007	0.008
〃	10	21,000	672	0.006	0.005	17,850	538	0.005	0.005	16,065	484	0.005	0.004
〃	12	18,700	544	0.004	0.003	15,895	435	0.004	0.003	14,306	392	0.003	0.002
〃	14	15,600	368	0.002	0.001	13,260	294	0.002	0.001	11,934	265	0.002	0.001
ø 0.9	6	27,600	1,264	0.019	0.019	23,460	1,011	0.017	0.017	21,114	910	0.015	0.015
〃	8	23,000	960	0.012	0.012	19,550	768	0.011	0.011	17,595	691	0.009	0.009
〃	10	20,000	752	0.008	0.008	17,000	602	0.007	0.007	15,300	541	0.006	0.006
ø 1.0	2	37,900	2,144	0.048	0.263	30,320	1,822	0.038	0.210	27,288	1,640	0.033	0.179
〃	3	37,900	2,144	0.048	0.263	30,320	1,822	0.038	0.210	27,288	1,640	0.033	0.179
〃	4	34,100	1,872	0.040	0.195	27,280	1,591	0.032	0.156	24,552	1,432	0.027	0.133
〃	5	30,300	1,600	0.032	0.083	24,240	1,360	0.026	0.066	21,816	1,224	0.022	0.056
〃	6	26,500	1,360	0.023	0.058	21,200	1,156	0.018	0.046	19,080	1,040	0.016	0.039
〃	8	22,100	1,056	0.014	0.024	17,680	898	0.011	0.019	15,912	808	0.010	0.016
〃	10	19,200	848	0.010	0.013	15,360	721	0.008	0.010	13,824	649	0.007	0.009
〃	12	17,200	704	0.007	0.007	13,760	598	0.006	0.006	12,384	539	0.005	0.005
〃	14	15,600	576	0.005	0.005	12,480	490	0.004	0.004	11,232	441	0.003	0.003
〃	16	14,300	480	0.004	0.003	11,440	408	0.003	0.002	10,296	367	0.003	0.002
〃	20	12,500	320	0.003	0.001	10,000	272	0.002	0.001	9,000	245	0.002	0.001
〃	25	10,800	192	0.003	0.001	8,640	163	0.002	0.001	7,776	147	0.002	0.001
〃	30	9,700	80	0.002	0.001	7,760	68	0.002	0.001	6,984	61	0.001	0.001
ø 1.2	4	28,900	1,888	0.050	0.189	23,120	1,605	0.040	0.151	20,808	1,444	0.034	0.129
〃	6	24,800	1,552	0.037	0.120	19,840	1,319	0.030	0.096	17,856	1,187	0.025	0.082
〃	8	20,700	1,216	0.024	0.051	16,560	1,034	0.019	0.041	14,904	930	0.016	0.035
〃	10	18,000	992	0.016	0.026	14,400	843	0.013	0.021	12,960	759	0.011	0.018
〃	12	16,100	832	0.011	0.015	12,880	707	0.009	0.012	11,592	636	0.007	0.010
〃	16	13,400	608	0.006	0.006	10,720	517	0.005	0.005	9,648	465	0.004	0.004
〃	20	11,700	448	0.004	0.003	9,360	381	0.003	0.002	8,424	343	0.003	0.002
〃	25	10,800	192	0.003	0.001	8,640	163	0.002	0.001	7,776	147	0.002	0.001
〃	30	9,700	80	0.002	0.001	7,760	68	0.002	0.001	6,984	61	0.001	0.001

2HREG Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 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 1.4	6	23,300	1,712	0.052	0.222	18,640	1,455	0.042	0.178	16,776	1,310	0.035	0.151
〃	8	19,500	1,360	0.035	0.094	15,600	1,156	0.028	0.075	14,040	1,040	0.024	0.064
〃	10	16,900	1,136	0.025	0.048	13,520	966	0.020	0.038	12,168	869	0.017	0.033
〃	14	13,700	816	0.013	0.018	10,960	694	0.010	0.014	9,864	624	0.009	0.012
〃	16	12,600	720	0.010	0.012	10,080	612	0.008	0.010	9,072	551	0.007	0.008
〃	20	10,300	480	0.006	0.005	8,240	408	0.005	0.004	7,416	367	0.004	0.003
ø 1.5	4	26,600	2,144	0.073	0.462	21,280	1,822	0.058	0.370	19,152	1,640	0.050	0.314
〃	6	22,800	1,792	0.057	0.293	18,240	1,523	0.046	0.234	16,416	1,371	0.039	0.199
〃	8	19,000	1,440	0.041	0.124	15,200	1,224	0.033	0.099	13,680	1,102	0.028	0.084
〃	10	16,600	1,200	0.030	0.063	13,280	1,020	0.024	0.050	11,952	918	0.020	0.043
〃	12	14,800	1,008	0.023	0.037	11,840	857	0.018	0.030	10,656	771	0.016	0.025
〃	14	13,400	880	0.017	0.023	10,720	748	0.014	0.018	9,648	673	0.012	0.016
〃	16	12,300	768	0.013	0.015	9,840	653	0.010	0.012	8,856	588	0.009	0.010
〃	18	11,500	672	0.011	0.011	9,200	571	0.009	0.009	8,280	514	0.007	0.007
〃	20	10,700	592	0.009	0.008	8,560	503	0.007	0.006	7,704	453	0.006	0.005
〃	25	9,300	432	0.005	0.004	7,440	367	0.004	0.003	6,696	330	0.003	0.003
〃	30	8,300	320	0.004	0.002	6,640	272	0.003	0.002	5,976	245	0.003	0.001
ø 1.6	10	16,100	1,248	0.035	0.082	12,880	1,061	0.028	0.066	11,592	955	0.024	0.056
〃	14	13,000	928	0.020	0.030	10,400	789	0.016	0.024	9,360	710	0.014	0.020
〃	18	11,100	720	0.013	0.014	8,880	612	0.010	0.011	7,992	551	0.009	0.010
ø 2.0	4	23,000	2,400	0.070	0.966	18,400	2,040	0.056	0.773	16,560	1,836	0.048	0.657
〃	6	20,300	2,160	0.064	0.926	16,240	1,836	0.051	0.741	14,616	1,652	0.044	0.630
〃	8	17,000	1,744	0.054	0.391	13,600	1,482	0.043	0.313	12,240	1,334	0.037	0.266
〃	10	14,800	1,472	0.045	0.200	11,840	1,251	0.036	0.160	10,656	1,126	0.031	0.136
〃	12	13,200	1,264	0.037	0.116	10,560	1,074	0.030	0.093	9,504	967	0.025	0.079
〃	14	12,000	1,120	0.031	0.073	9,600	952	0.025	0.058	8,640	857	0.021	0.050
〃	16	11,100	992	0.026	0.049	8,880	843	0.021	0.039	7,992	759	0.018	0.033
〃	18	10,300	880	0.022	0.034	8,240	748	0.018	0.027	7,416	673	0.015	0.023
〃	20	9,600	800	0.018	0.025	7,680	680	0.014	0.020	6,912	612	0.012	0.017
〃	22	8,700	672	0.014	0.018	6,960	571	0.011	0.014	6,264	514	0.010	0.012
〃	25	8,400	624	0.012	0.013	6,720	530	0.010	0.010	6,048	477	0.008	0.009
〃	30	7,500	496	0.008	0.007	6,000	422	0.006	0.006	5,400	379	0.005	0.005
ø 2.5	8	15,000	2,144	0.077	0.954	12,000	1,822	0.062	0.763	10,800	1,640	0.052	0.649
〃	10	13,100	1,824	0.068	0.488	10,480	1,550	0.054	0.390	9,432	1,395	0.046	0.332
〃	12	11,800	1,600	0.060	0.283	9,440	1,360	0.048	0.226	8,496	1,224	0.041	0.192
〃	16	9,900	1,264	0.045	0.119	7,920	1,074	0.036	0.095	7,128	967	0.031	0.081
〃	20	8,700	1,040	0.033	0.061	6,960	884	0.026	0.049	6,264	796	0.022	0.041
〃	25	7,600	832	0.022	0.031	6,080	707	0.018	0.025	5,472	636	0.015	0.021
〃	30	6,800	688	0.014	0.018	5,440	585	0.011	0.014	4,896	526	0.010	0.012
〃	35	6,200	608	0.009	0.012	4,960	517	0.007	0.010	4,464	465	0.006	0.008
〃	40	5,700	464	0.005	0.008	4,560	394	0.004	0.006	4,104	355	0.003	0.005
〃	50	5,000	304	0.001	0.004	4,000	258	0.001	0.003	3,600	233	0.001	0.003
ø 3	6	13,200	2,352	0.103	1.978	10,560	1,999	0.082	1.582	9,504	1,799	0.070	1.345
〃	10	11,600	2,032	0.092	1.013	9,280	1,727	0.074	0.810	8,352	1,554	0.063	0.689
〃	12	10,500	1,776	0.081	0.586	8,400	1,510	0.065	0.469	7,560	1,359	0.055	0.398
〃	16	8,900	1,440	0.064	0.247	7,120	1,224	0.051	0.198	6,408	1,102	0.044	0.168
〃	20	7,800	1,200	0.050	0.127	6,240	1,020	0.040	0.102	5,616	918	0.034	0.086
〃	25	6,900	992	0.036	0.065	5,520	843	0.029	0.052	4,968	759	0.024	0.044
〃	30	6,200	832	0.026	0.038	4,960	707	0.021	0.030	4,464	636	0.018	0.026
〃	35	5,700	704	0.018	0.024	4,560	598	0.014	0.019	4,104	539	0.012	0.016
〃	40	5,300	592	0.013	0.016	4,240	503	0.010	0.013	3,816	453	0.009	0.011
〃	45	5,000	528	0.008	0.012	4,000	449	0.006	0.010	3,600	404	0.005	0.008
〃	50	4700	432	0.006	0.008	3,760	367	0.005	0.006	3,384	330	0.004	0.005
〃	60	4,500	400	0.003	0.005	3,600	340	0.002	0.004	3,240	306	0.002	0.003
ø 4	8	10,000	2,560	0.140	1.990	8,000	2,176	0.112	1.592	7,200	1,958	0.095	1.353
〃	10	9,200	2,240	0.120	1.960	7,360	1,904	0.096	1.568	6,624	1,714	0.082	1.333
〃	12	8,500	2,048	0.112	1.852	6,800	1,741	0.090	1.482	6,120	1,567	0.076	1.259
〃	16	7,200	1,680	0.093	0.781	5,760	1,428	0.074	0.625	5,184	1,285	0.063	0.531
〃	20	6,300	1,408	0.077	0.400	5,040	1,197	0.062	0.320	4,536	1,077	0.052	0.272
〃	25	5,600	1,200	0.061	0.205	4,480	1,020	0.049	0.164	4,032	918	0.041	0.139
〃	30	5,000	1,008	0.048	0.119	4,000	857	0.038	0.095	3,600	771	0.033	0.081
〃	35	4,600	864	0.038	0.075	3,680	734	0.030	0.060	3,312	661	0.026	0.051
〃	40	4,200	752	0.030	0.050	3,360	639	0.024	0.040	3,024	575	0.020	0.034
〃	45	3,900	656	0.023	0.035	3,120	558	0.018	0.028	2,808	502	0.016	0.024
〃	50	3,700	576	0.018	0.026	2,960	490	0.014	0.021	2,664	441	0.012	0.018
〃	55	3,500	512	0.015	0.020	2,800	435	0.012	0.016	2,520	392	0.010	0.014
〃	60	3,300	448	0.011	0.015	2,640	381	0.009	0.012	2,376	343	0.007	0.010

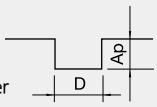
2HREG Cutting Condition

• RPM : rev./min • Feed : mm/min

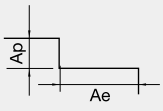
피삭재 Material		동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness						40 ~ 50HRc				50 ~ 52HRc			
외경 Outside Diameter	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 5	16	6,000	1,824	0.127	1.907	4,800	1,550	0.102	1.526	4,320	1,395	0.086	1.297
〃	20	5,300	1,568	0.121	0.977	4,240	1,333	0.097	0.782	3,816	1,200	0.082	0.664
〃	25	4,600	1,312	0.109	0.500	3,680	1,115	0.087	0.400	3,312	1,004	0.074	0.340
〃	30	4,200	1,136	0.094	0.289	3,360	966	0.075	0.231	3,024	869	0.064	0.197
〃	35	3,800	992	0.077	0.182	3,040	843	0.062	0.146	2,736	759	0.052	0.124
〃	40	3,500	864	0.060	0.122	2,800	734	0.048	0.098	2,520	661	0.041	0.083
〃	50	3,100	688	0.031	0.063	2,480	585	0.025	0.050	2,232	526	0.021	0.043
〃	60	2,800	560	0.013	0.036	2,240	476	0.010	0.029	2,016	428	0.009	0.024
ø 6	20	4,200	1,536	0.126	2.025	3,360	1,306	0.101	1.620	3,024	1,175	0.086	1.377
〃	30	3,400	1,168	0.109	0.600	2,720	993	0.087	0.480	2,448	894	0.074	0.408
〃	40	3,000	960	0.083	0.253	2,400	816	0.066	0.202	2,160	734	0.056	0.172
〃	50	2,600	768	0.054	0.130	2,080	653	0.043	0.104	1,872	588	0.037	0.088
〃	60	2,400	656	0.031	0.075	1,920	558	0.025	0.060	1,728	502	0.021	0.051
ø 8	20	3,200	1,456	0.180	1.600	2,560	1,238	0.144	1.280	2,304	1,114	0.122	1.088
〃	40	2,600	960	0.120	0.200	2,080	816	0.096	0.160	1,872	734	0.082	0.136
ø 10	25	2,900	1,424	0.200	1.760	2,320	1,210	0.160	1.408	2,088	1,089	0.136	1.197
〃	45	2,200	928	0.140	0.240	1,760	789	0.112	0.192	1,584	710	0.095	0.163
ø 12	30	2,000	1,296	0.190	1.650	1,600	1,102	0.152	1.320	1,440	991	0.129	1.122
〃	50	1,950	912	0.150	0.250	1,560	775	0.120	0.200	1,404	698	0.102	0.170

절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth



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- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이며 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- 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, or found red heat on the material, 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㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

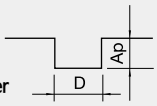
4HREG Cutting Condition

• RPM : rev./min • Feed : mm/min

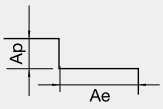
피삭재 Material		동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
Ø 0.8	8	24,100	1,235	0.009	0.01	20,485	988	0.008	0.01	18,430	840	0.006	0.01
〃	12	18,700	707	0.004	0.003	15,895	566	0.004	0.003	14,306	481	0.003	0.002
Ø 1	8	22,100	1,373	0.014	0.024	17,680	1,098	0.011	0.019	15,912	934	0.010	0.016
〃	16	14,300	624	0.004	0.003	11,440	499	0.003	0.002	10,296	424	0.003	0.002
〃	25	10,800	250	0.003	0.001	8,640	200	0.002	0.001	7,776	170	0.002	0.001
Ø 1.5	8	19,000	1,872	0.041	0.124	15,200	1,498	0.033	0.099	13,680	1,273	0.028	0.084
〃	16	12,300	998	0.013	0.015	9,840	799	0.010	0.012	8,856	679	0.009	0.010
〃	25	9,300	562	0.005	0.004	7,440	449	0.004	0.003	6,696	382	0.003	0.003
Ø 2	8	17,000	2,267	0.054	0.391	13,600	1,814	0.043	0.313	12,240	1,542	0.037	0.266
〃	16	11,100	1,290	0.026	0.049	8,880	1,032	0.021	0.039	7,992	877	0.018	0.033
〃	25	8,400	811	0.012	0.013	6,720	649	0.010	0.010	6,048	552	0.008	0.009
Ø 2.5	10	13,100	2,371	0.068	0.488	10,480	1,897	0.054	0.390	9,432	1,612	0.046	0.332
〃	16	9,900	1,643	0.045	0.119	7,920	1,315	0.036	0.095	7,128	1,117	0.031	0.081
〃	30	6,800	894	0.014	0.018	5,440	716	0.011	0.014	4,896	608	0.010	0.012
Ø 3	10	11,600	2,642	0.092	1.013	9,280	2,113	0.074	0.810	8,352	1,796	0.063	0.689
〃	16	8,900	1,872	0.064	0.247	7,120	1,498	0.051	0.198	6,408	1,273	0.044	0.168
〃	25	6,900	1,290	0.036	0.065	5,520	1,032	0.029	0.052	4,968	877	0.024	0.044
〃	35	5,700	915	0.018	0.024	4,560	732	0.014	0.019	4,104	622	0.012	0.016
Ø 4	10	9,200	2,912	0.120	1.960	7,360	2,330	0.096	1.568	6,624	1,980	0.082	1.333
〃	16	7,200	2,184	0.093	0.781	5,760	1,747	0.074	0.625	5,184	1,485	0.063	0.531
〃	25	5,600	1,560	0.061	0.205	4,480	1,248	0.049	0.164	4,032	1,061	0.041	0.139
〃	40	4,200	978	0.030	0.050	3,360	782	0.024	0.040	3,024	665	0.020	0.034
Ø 5	15	6,000	2,371	0.127	1.907	4,800	1,897	0.102	1.526	4,320	1,612	0.086	1.297
〃	25	4,600	1,706	0.109	0.500	3,680	1,364	0.087	0.400	3,312	1,160	0.074	0.340
〃	40	3,500	1,123	0.060	0.122	2,800	899	0.048	0.098	2,520	764	0.041	0.083
Ø 6	20	4,200	1,997	0.126	2.025	3,360	1,597	0.101	1.620	3,024	1,358	0.086	1.377
〃	40	3,000	1,248	0.083	0.253	2,400	998	0.066	0.202	2,160	849	0.056	0.172
Ø 8	20	3,200	1,893	0.180	1.600	2,560	1,514	0.144	1.280	2,304	1,287	0.122	1.088
〃	40	2,600	1,248	0.120	0.200	2,080	998	0.096	0.160	1,872	849	0.082	0.136
Ø 10	25	2,900	1,851	0.200	1.760	2,320	1,481	0.160	1.408	2,088	1,259	0.136	1.197
〃	45	2,200	1,206	0.140	0.240	1,760	965	0.112	0.192	1,584	820	0.095	0.163
Ø 12	30	2,000	1,685	0.190	1.650	1,600	1,348	0.152	1.320	1,440	1,146	0.129	1.122
〃	50	1,950	1,186	0.150	0.250	1,560	948	0.120	0.200	1,404	806	0.102	0.170

절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth



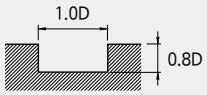
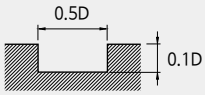
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- 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, or found red heat on the material, 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㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

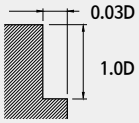
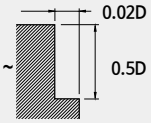
2HCEG/2LEMG Cutting Condition

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness					40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 0.1	50,000	300	0.01	0.1	45,000	240	0.08	0.05	40,500	168	0.08	0.05
ø 0.2	50,000	390	0.02	0.2	45,000	312	0.16	0.10	40,500	218	0.16	0.10
ø 0.3	50,000	570	0.03	0.3	45,000	456	0.24	0.15	40,500	319	0.24	0.15
ø 0.4	50,000	705	0.04	0.4	45,000	564	0.32	0.20	40,500	395	0.32	0.20
ø 0.5	50,000	1,110	0.05	0.5	45,000	888	0.40	0.25	40,500	622	0.40	0.25
ø 0.6	50,000	1,410	0.06	0.6	45,000	1,128	0.48	0.30	40,500	790	0.48	0.30
ø 0.8	50,000	1,800	0.08	0.8	40,000	1,440	0.64	0.40	30,000	1,008	0.64	0.40
ø 0.9	49,000	1,965	0.09	0.9	39,000	1,572	0.72	0.45	27,800	1,100	0.72	0.45
ø 1	48,000	2,250	0.10	1.0	38,000	1,800	0.80	0.50	25,500	1,260	0.80	0.50
ø 2	33,300	2,550	0.20	2.0	26,000	2,040	1.60	1.00	17,500	1,428	1.60	1.00
ø 3	21,800	2,550	0.30	3.0	17,300	2,040	2.40	1.50	11,500	1,428	2.40	1.50
ø 4	16,700	2,640	0.40	4.0	13,200	2,112	3.20	2.00	8,800	1,478	3.20	2.00
ø 5	15,700	3,000	0.50	5.0	12,500	2,400	4.00	2.50	8,300	1,680	4.00	2.50
ø 6	13,000	2,850	0.60	6.0	10,350	2,280	4.80	3.00	6,900	1,596	4.80	3.00
ø 8	9,880	2,790	0.80	8.0	7,800	2,232	6.40	4.00	5,200	1,562	6.40	4.00
ø 10	7,800	2,550	1.00	10.0	6,150	2,040	8.00	5.00	4,100	1,428	8.00	5.00
ø 12	6,650	2,550	1.20	12.0	5,250	2,040	9.60	6.00	3,500	1,428	9.60	6.00
ø 16	5,540	2,340	1.60	16.0	4,340	1,872	12.80	8.00	2,600	1,310	12.80	8.00
ø 18	5,540	2,340	1.80	18.0	4,340	1,872	14.40	9.00	2,600	1,310	14.40	9.00
ø 20	4,640	2,160	2.00	20.0	4,340	1,728	16.00	10.00	2,100	1,210	16.00	10.00
절입량 Depth of Cut	~ 40HRC 				40HRC ~ 							

측면절삭 Side Cutting

피삭재 Material	동 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness					40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 1	48,000	1,050	1	0.03	38,000	735	0.50	0.02	25,500	515	0.50	0.02
ø 2	33,300	1,200	2	0.06	26,000	840	1.00	0.04	17,500	588	1.00	0.04
ø 3	21,800	1,200	3	0.09	17,300	840	1.50	0.06	11,500	588	1.50	0.06
ø 4	16,700	1,250	4	0.12	13,200	875	2.00	0.08	8,800	613	2.00	0.08
ø 5	15,700	1,450	5	0.15	12,500	1,015	2.50	0.10	8,300	711	2.50	0.10
ø 6	13,000	1,350	6	0.18	10,350	945	3.00	0.12	6,900	662	3.00	0.12
ø 8	9,880	1,320	8	0.24	7,800	924	4.00	0.16	5,200	647	4.00	0.16
ø 10	7,800	1,200	10	0.30	6,150	840	5.00	0.20	4,100	588	5.00	0.20
ø 12	6,650	1,200	12	0.36	5,250	840	6.00	0.24	3,500	588	6.00	0.24
ø 16	5,540	1,000	16	0.48	4,340	700	8.00	0.32	2,600	490	8.00	0.32
ø 18	5,540	1,000	18	0.54	4,340	700	9.00	0.36	2,600	490	9.00	0.36
ø 20	4,640	950	20	0.60	4,340	760	10.00	0.40	2,100	532	10.00	0.40
절입량 Depth of Cut	~ 40HRC 				40HRC ~ 							

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛ 이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- 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, or found red heat on the material, 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㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

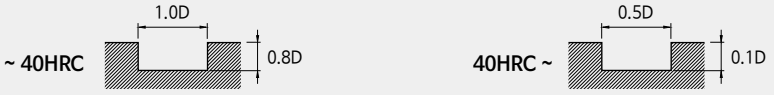
4HCEG/4LEMG Cutting Condition

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness					40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 1	48,000	2,700	0.10	1.0	38,000	2,160	0.80	0.50	25,500	1,512	0.80	0.50
ø 2	33,300	3,060	0.20	2.0	26,000	2,448	1.60	1.00	17,500	1,714	1.60	1.00
ø 3	21,800	3,060	0.30	3.0	17,300	2,448	2.40	1.50	11,500	1,714	2.40	1.50
ø 4	16,700	3,168	0.40	4.0	13,200	2,534	3.20	2.00	8,800	1,774	3.20	2.00
ø 5	15,700	3,600	0.50	5.0	12,500	2,880	4.00	2.50	8,300	2,016	4.00	2.50
ø 6	13,000	3,420	0.60	6.0	10,350	2,736	4.80	3.00	6,900	1,915	4.80	3.00
ø 8	9,880	3,348	0.80	8.0	7,800	2,678	6.40	4.00	5,200	1,875	6.40	4.00
ø 10	7,800	3,060	1.00	10.0	6,150	2,448	8.00	5.00	4,100	1,714	8.00	5.00
ø 12	6,650	3,060	1.20	12.0	5,250	2,448	9.60	6.00	3,500	1,714	9.60	6.00
ø 16	5,540	2,808	1.60	16.0	4,340	2,246	12.80	8.00	2,600	1,572	12.80	8.00
ø 18	5,540	2,808	1.80	18.0	4,340	2,246	14.40	9.00	2,600	1,572	14.40	9.00
ø 20	4,640	2,592	2.00	20.0	4,340	2,074	16.00	10.00	2,100	1,452	16.00	10.00

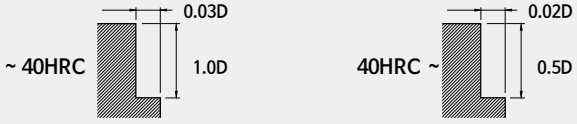
절입량 Depth of Cut



측면절삭 Side Cutting

피삭재 Material	동 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness					40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 1	48,000	1,155	1	0.03	38,000	809	1	0.03	25,500	566	0.50	0.02
ø 2	33,300	1,320	2	0.06	26,000	924	2	0.06	17,500	647	1.00	0.04
ø 3	21,800	1,320	3	0.09	17,300	924	3	0.09	11,500	647	1.50	0.06
ø 4	16,700	1,375	4	0.12	13,200	963	4	0.12	8,800	674	2.00	0.08
ø 5	15,700	1,595	5	0.15	12,500	1,117	5	0.15	8,300	782	2.50	0.10
ø 6	13,000	1,485	6	0.18	10,350	1,040	6	0.18	6,900	728	3.00	0.12
ø 8	9,880	1,452	8	0.24	7,800	1,016	8	0.24	5,200	711	4.00	0.16
ø 10	7,800	1,320	10	0.30	6,150	924	10	0.30	4,100	647	5.00	0.20
ø 12	6,650	1,320	12	0.36	5,250	924	12	0.36	3,500	647	6.00	0.24
ø 16	5,540	1,100	16	0.48	4,340	770	16	0.48	2,600	539	8.00	0.32
ø 18	5,540	1,100	18	0.54	4,340	770	18	0.54	2,600	539	9.00	0.36
ø 20	4,640	1,045	20	0.60	4,340	836	20	0.60	2,100	585	10.00	0.40

절입량 Depth of Cut



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- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
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- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø10이하 사용시 진동 허용 관리 5㎛ 이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

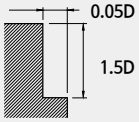
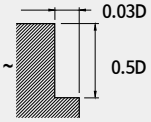
- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- 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, or found red heat on the material, 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㎛).
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4HEMG Cutting Condition

• RPM : rev./min • Feed : mm/min

측면절삭 Side Cutting

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 1	40,000	720	1.5	0.05	40,000	660	1.5	0.05	40,000	308	0.5	0.03
ø 1.5	40,000	900	2.25	0.075	40,000	750	2.25	0.075	38,500	350	0.75	0.045
ø 2	40,000	1,200	3	0.1	38,000	1,080	3	0.1	36,500	504	1	0.06
ø 3	38,400	2,736	4.5	0.15	34,560	2,462	4.5	0.15	27,648	1,149	1.5	0.09
ø 4	28,800	3,168	6	0.2	25,920	2,851	6	0.2	20,736	1,331	2	0.12
ø 5	24,000	3,600	7.5	0.25	21,600	3,240	7.5	0.25	17,280	1,512	2.5	0.15
ø 6	19,200	4,176	9	0.3	17,280	3,758	9	0.3	13,824	1,754	3	0.18
ø 8	14,400	4,176	12	0.4	12,960	3,758	12	0.4	10,368	1,754	4	0.24
ø 10	11,520	4,176	15	0.5	10,368	3,758	15	0.5	8,294	1,754	5	0.3
ø 12	9,600	3,456	18	0.6	8,640	3,110	18	0.6	6,912	1,452	6	0.36
ø 16	7,200	2,592	24	0.8	6,480	2,333	24	0.8	5,184	1,089	8	0.48
ø 20	5,760	2,088	30	1	5,184	1,879	30	1	4,147	877	10	0.6

절입량 Depth of Cut	~ 50HRC  0.05D 1.5D	50HRC ~  0.03D 0.5D

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- HRC52 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 시켜주십시오.
- 유효장이길게체결할시회전수와피드를같은비율로DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를초 과하거나 버 및 적열현상이 발생할 때 스핀들속도와 이송속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When milling workpiece HRC over 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- If you clamp the endmill with long overhang of effective length, reduce the RPM and feed in the same proportion.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

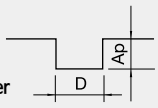
2CREG Cutting Condition

• RPM : rev./min • Feed : mm/min

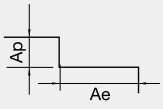
피삭재 Material		동 합금 Copper alloys C1100				합금강 / 프리하든강 Alloy Steels / Prehardened Steels NAK80/KP4M				고경도강 Hardened Steels STAVAX/SKD11			
경도 Hardness						40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.2	1	50,000	352	0.016	0.020	50,000	264	0.006	0.020	34,500	211	0.004	0.020
〃	1.5	50,000	311	0.017	0.010	50,000	233	0.005	0.010	26,450	186	0.003	0.010
ø 0.3	1	50,000	890	0.029	0.020	50,000	668	0.007	0.020	34,500	534	0.005	0.015
〃	3	50,000	393	0.029	0.015	50,000	295	0.006	0.015	24,150	236	0.003	0.010
ø 0.4	1	47,150	890	0.047	0.062	50,000	668	0.013	0.070	39,675	534	0.011	0.070
〃	3	33,350	683	0.026	0.053	26,450	512	0.008	0.026	26,450	410	0.007	0.026
ø 0.5	1	48,300	2,008	0.079	0.114	48,300	668	0.033	0.119	39,100	534	0.029	0.119
〃	3	31,050	1,118	0.056	0.088	31,050	525	0.022	0.110	25,415	420	0.020	0.110
〃	5	25,760	827	0.026	0.044	25,760	510	0.011	0.010	20,700	408	0.010	0.010
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	1,449	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	1,925	0.293	0.660	12,880	1,070	0.059	0.440	11,730	920	0.044	0.440
〃	10	8,280	1,325	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	1,801	0.314	0.836	12,535	1,001	0.059	0.792	11,730	909	0.042	0.792
〃	12	9,200	1,449	0.182	0.704	9,200	805	0.043	0.440	8,280	725	0.030	0.440
〃	20	6,900	1,139	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	1,801	0.331	0.836	10,350	1,001	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	2,029	0.381	0.831	10,350	1,127	0.103	0.655	9,775	874	0.103	0.616
〃	20	8,165	1,553	0.254	0.762	6,050	863	0.071	0.567	3,420	667	0.071	0.567
〃	30	6,900	1,263	0.137	0.674	3,300	702	0.049	0.371	2,890	541	0.049	0.371
ø 4	12	8,740	1,904	0.401	1.525	8,740	1,058	0.117	1.124	7,360	920	0.081	1.124
〃	20	6,785	1,458	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	3,064	0.697	2.277	7,705	1,702	0.150	1.346	5,520	1,139	0.106	1.346
〃	30	5,290	1,470	0.342	1.760	2,780	817	0.075	1.035	3,795	541	0.053	1.035
ø 6	20	5,980	2,194	0.600	2.194	5,460	1,219	0.476	1.356	3,565	1,035	0.186	1.356
〃	40	4,600	1,635	0.565	2.049	2,380	909	0.410	1.304	2,160	759	0.164	1.304
ø 8	22	5,520	1,946	0.528	2.542	5,520	1,081	0.419	1.518	3,220	909	0.164	1.518
〃	40	4,140	1,449	0.497	2.277	2,120	805	0.361	1.323	2,080	667	0.144	1.323
ø 10	24	4,600	1,656	0.449	2.887	4,485	920	0.356	1.645	2,760	771	0.139	1.645
〃	45	3,450	1,221	0.423	2.438	3,450	679	0.307	1.334	1,955	564	0.122	1.334
ø 12	26	3,795	1,387	0.377	3.013	3,795	771	0.299	2.024	2,300	644	0.117	2.024
〃	50	2,875	1,035	0.355	2.415	2,875	575	0.258	1.403	1,725	483	0.103	1.403
ø 16	35	2,990	1,097	0.302	2.921	2,990	610	0.239	2.162	1,725	518	0.094	2.162

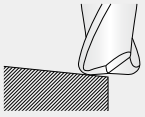
절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth





경사진면절삭 Inclined Cutting

- HRC52 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜 주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 30% 이하로 줄이십시오.
- Ae 값 설정시 코너R 치수를 고려해 주십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.

- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Consider the corner radius value when you set up the Ae value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.

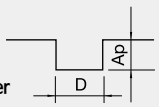
4CREG Cutting Condition

• RPM : rev./min • Feed : mm/min

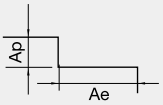
피삭재 Material		공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVX / SKD11			
경도 Hardness		30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 1	4	13,110	1,884	0.216	0.435	13,110	700	0.038	0.290	13,000	650	0.032	0.290
〃	10	8,194	727	0.052	0.339	8,194	404	0.014	0.135	7,101	343	0.012	0.135
ø 1.2	4	12,500	1,346	0.200	0.503	8,740	950	0.024	0.097	12,500	750	0.019	0.097
〃	10	8,000	861	0.058	0.435	6,337	650	0.009	0.077	5,681	389	0.008	0.077
ø 1.5	6	12,236	2,503	0.323	0.726	12,236	1,390	0.065	0.484	11,144	900	0.048	0.484
〃	12	7,866	1,722	0.161	0.610	7,866	957	0.045	0.310	7,211	822	0.034	0.310
ø 2	6	11,908	2,341	0.345	0.919	11,908	1,301	0.065	0.871	11,144	1,181	0.046	0.871
〃	12	8,740	1,884	0.200	0.774	8,740	1,047	0.047	0.484	7,866	942	0.033	0.484
ø 2.5	10	9,833	2,341	0.365	0.919	9,833	1,301	0.081	0.581	9,286	1,226	0.056	0.581
〃	20	5,900	1,023	0.074	0.677	5,900	568	0.017	0.194	5,572	538	0.012	0.194
ø 3	10	9,833	2,637	0.419	0.914	9,833	1,465	0.113	0.720	9,286	1,136	0.113	0.678
〃	20	7,757	2,018	0.280	0.839	5,748	1,121	0.078	0.624	3,249	867	0.078	0.624
ø 4	12	8,303	2,476	0.441	1.677	8,303	1,375	0.129	1.237	6,992	1,196	0.089	1.237
〃	20	6,446	1,895	0.413	1.457	5,586	1,053	0.086	0.968	5,463	1,091	0.058	0.968
〃	30	5,463	978	0.215	1.331	2,803	543	0.046	0.738	2,413	852	0.031	0.738
ø 6	20	5,681	2,852	0.660	2.414	5,187	1,585	0.524	1.491	3,387	1,346	0.205	1.491
〃	40	4,370	2,126	0.622	2.254	2,261	1,181	0.451	1.435	2,052	987	0.180	1.435
ø 8	22	5,244	2,530	0.581	2.796	5,244	1,405	0.461	1.670	3,059	1,181	0.180	1.670
ø 10	24	4,370	2,153	0.494	3.175	4,261	1,196	0.392	1.809	2,622	1,002	0.153	1.809
ø 12	26	3,605	1,803	0.415	3.314	3,605	1,002	0.329	2.226	2,185	837	0.129	2.226

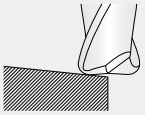
절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth





경사진면절삭 Inclined Cutting

- HRC52 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜 주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- Ae 값 설정시 코너R 치수를 고려해 주십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.

- When milling workpiece HRC over 52 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Consider the corner radius value when you set up the Ae value.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.

2NCRG/4NCRG

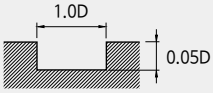
■ 4NCRG는 RPM 동일, FEED만 최대 **30% Up** 적용.
■ Use the same RPM and raise up the feed up to 30% for 4NCRG.

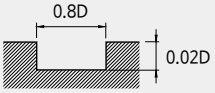
• RPM : rev./min • Feed : mm/min

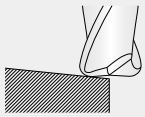
홈절삭 Slotting

피삭재 Material	공구강/ 금형강 Tool steels / Mold steels				프리하든강 Prehardened Steels				고경도강 Hardened Steels			
경도 Hardness	30 ~ 40HRc				40 ~ 50HRc				45 ~ 55HRc			
외경 Outside Diameter	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 0.4	42,500	562	0.020	0.4	38,250	268	0.008	0.32	34,000	107	0.008	0.32
ø 0.5	42,500	643	0.025	0.5	38,250	306	0.01	0.4	34,000	122	0.01	0.4
ø 0.6	42,500	723	0.03	0.6	38,250	344	0.012	0.48	34,000	138	0.012	0.48
ø 0.8	42,500	803	0.04	0.8	38,250	383	0.016	0.64	25,500	153	0.016	0.64
ø 1	40,800	1,992	0.05	1	32,300	949	0.02	0.8	21,675	379	0.02	0.8
ø 2	28,305	2,378	0.1	2	22,100	1,132	0.04	1.6	14,875	453	0.04	1.6
ø 3	18,530	2,410	0.15	3	14,705	1,148	0.06	2.4	9,775	648	0.06	2.4
ø 4	14,195	2,474	0.2	4	11,220	1,178	0.08	3.2	7,480	689	0.08	3.2
ø 5	13,345	2,635	0.25	5	10,625	1,255	0.1	4	7,055	716	0.1	4
ø 6	11,135	2,570	0.3	6	8,798	1,224	0.12	4.8	5,865	743	0.12	4.8
ø 8	8,398	2,345	0.4	8	6,630	1,117	0.16	6.4	4,420	695	0.16	6.4
ø 10	6,630	2,185	0.5	10	5,228	1,040	0.2	8	3,485	662	0.2	8
ø 12	5,653	2,185	0.6	12	4,463	1,040	0.24	9.6	2,975	655	0.24	9.6

절입량 Depth of Cut

~ 40HRC 

40HRC ~ 

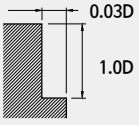


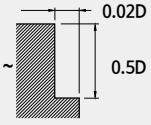
경사진면절삭 Inclined Cutting

측면절삭 Side Cutting

피삭재 Material	공구강/ 금형강 Tool steels / Mold steels				프리하든강 Prehardened Steels				고경도강 Hardened Steels			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 0.4	42,500	236	0.4	0.01	38,250	212	0.2	0.01	34,000	127	0.20	0.01
ø 0.5	42,500	261	0.5	0.015	38,250	235	0.25	0.01	34,000	141	0.25	0.01
ø 0.6	42,500	263	0.6	0.018	38,250	236	0.30	0.012	34,000	142	0.30	0.012
ø 0.8	42,500	427	0.8	0.024	34,000	384	0.40	0.016	25,500	231	0.40	0.016
ø 1	40,800	833	1	0.03	32,300	750	0.50	0.02	21,675	450	0.50	0.02
ø 2	28,305	1,224	2	0.06	22,100	1,102	1.00	0.04	14,875	661	1.00	0.04
ø 3	18,530	1,250	3	0.09	14,705	1,125	1.50	0.06	9,775	675	1.50	0.06
ø 4	14,195	1,275	4	0.12	11,220	1,148	2.00	0.08	7,480	689	2.00	0.08
ø 5	13,345	1,479	5	0.15	10,625	1,331	2.50	0.1	7,055	799	2.50	0.1
ø 6	11,135	1,377	6	0.18	8,798	1,239	3.00	0.12	5,865	744	3.00	0.12
ø 8	8,398	1,346	8	0.24	6,630	1,212	4.00	0.16	4,420	727	4.00	0.16
ø 10	6,630	1,224	10	0.3	5,228	1,102	5.00	0.2	3,485	661	5.00	0.2
ø 12	5,653	1,200	12	0.36	4,463	1,100	6.00	0.24	2,975	635	6.00	0.24

절입량 Depth of Cut

~ 40HRC 

40HRC ~ 

- HRC52 이상인 경우 같은 직경의 같은 비율로 20% DOWN 시켜 주십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 30%까지 UP 해주십시오.
- 상기 절삭조건표는 2날 기준이며, 4날시 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대 30%까지 UP 해주십시오.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이며 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 피 삭재와 절삭 형상을 위한 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

- When milling workpiece is over HRC 52 hardened steel, reduce 20% of the RPM and feed compared to the same diameter.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 30% in stable milling condition.
- The parameters on the table is based on 2 flutes. For using 4 flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use the adequate coolant for work material and machining geometry and note for heat and ignition.

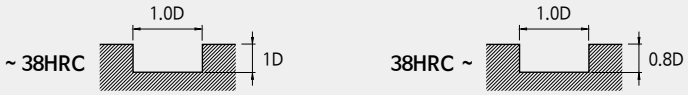
3&4ROUG Cutting Condition

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels / Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M			
경도 Hardness	~ 200HB				~ 30HRc				30 ~ 40HRc				40 ~ 45HRc			
외경 Outside Diameter	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
ø 4	3,870	395	4	4	3,251	191	4	4	2,786	170	4	4	2,167	111	3.2	4
ø 5	3,870	395	5	5	3,251	218	5	5	2,477	195	5	5	1,858	127	4	5
ø 6	3,251	395	6	6	2,786	254	6	6	2,167	227	6	6	1,625	148	4.8	6
ø 8	2,477	395	8	8	2,090	305	8	8	1,625	273	8	8	1,238	177	6.4	8
ø 10	2,012	395	10	10	1,703	343	10	10	1,238	307	10	10	1,006	199	8	10
ø 12	1,625	395	12	12	1,393	300	12	12	1,084	268	12	12	851	174	9.6	12
ø 16	1,238	395	16	16	1,084	276	16	16	774	246	16	16	619	160	12.8	16
ø 20	1,006	372	20	20	851	254	20	20	619	227	20	20	495	148	16	20

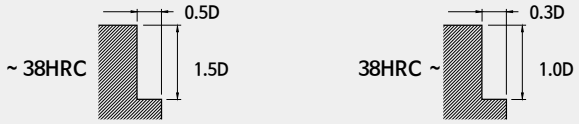
절입량 Depth of Cut



측면절삭 Side Cutting

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels / Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M			
경도 Hardness	~ 200HB				~ 30HRc				30 ~ 40HRc				40 ~ 45HRc			
외경 Outside Diameter	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
ø 4	4,300	439	6	2	3,612	280	6	2	3,096	194	6	2	2,408	140	4	1.2
ø 5	4,300	439	7.5	2.5	3,612	290	7.5	2.5	2,752	215	7.5	2.5	2,064	161	5	1.5
ø 6	3,612	439	9	3	3,096	312	9	3	2,408	237	9	3	1,806	183	6	1.8
ø 8	2,752	439	12	4	2,322	355	12	4	1,806	269	12	4	1,376	204	8	2.4
ø 10	2,236	439	15	5	1,892	371	15	5	1,376	280	15	5	1,118	226	10	3
ø 12	1,806	439	18	6	1,548	387	18	6	1,204	290	18	6	946	231	12	3.6
ø 16	1,376	439	24	8	1,204	414	24	8	860	312	24	8	688	237	16	4.8
ø 20	1,118	413	30	10	946	403	30	10	688	301	30	10	550	226	20	6

절입량 Depth of Cut



- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적 입니다.

- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

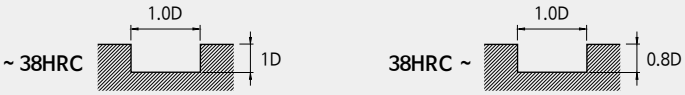
3&4HROUG Cutting Condition

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels / Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304 / SUS316			
경도 Hardness	~ 200HB				~ 30HRc				30 ~ 40HRc				40 ~ 45HRc			
외경 Outside Diameter	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
ø 4	4,698	486	4	4	3,888	243	4	4	3,321	162	4	4	2,592	122	3.2	4
ø 5	4,698	486	5	5	3,888	251	5	5	2,997	186	5	5	2,268	138	4	5
ø 6	3,888	486	6	6	3,402	267	6	6	2,592	203	6	6	1,944	162	4.8	6
ø 8	2,997	486	8	8	2,511	307	8	8	1,944	235	8	8	1,458	178	6.4	8
ø 10	2,430	486	10	10	2,025	324	10	10	1,458	243	10	10	1,215	203	8	10
ø 12	1,944	486	12	12	1,701	332	12	12	1,296	251	12	12	1,053	203	9.6	12
ø 16	1,499	486	16	16	1,296	356	16	16	972	267	16	16	810	203	12.8	16
ø 20	1,215	446	20	20	1,053	348	20	20	729	259	20	20	608	194	16	20

절입량 Depth of Cut



측면절삭 Side Cutting

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels / Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304 / SUS316			
경도 Hardness	~ 200HB				~ 30HRc				30 ~ 40HRc				40 ~ 45HRc			
외경 Outside Diameter	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
ø 4	5,220	540	6	2	4,320	270	6	2	3,690	180	6	2	2,880	135	4	1.6
ø 5	5,220	540	7.5	2.5	4,320	279	7.5	2.5	3,330	207	7.5	2.5	2,520	153	5	2
ø 6	4,320	540	9	3	3,780	297	9	3	2,880	225	9	3	2,160	180	6	2.4
ø 8	3,330	540	12	4	2,790	342	12	4	2,160	261	12	4	1,620	198	8	3.2
ø 10	2,700	540	15	5	2,250	360	15	5	1,620	270	15	5	1,350	225	10	4
ø 12	2,160	540	18	6	1,890	369	18	6	1,440	279	18	6	1,170	225	12	4.8
ø 16	1,665	540	24	8	1,440	396	24	8	1,080	297	24	8	900	225	16	6.4
ø 20	1,350	495	30	10	1,170	387	30	10	810	288	30	10	675	216	20	8

절입량 Depth of Cut

- 가능한 공구 길이 측정시 유압식 측정이 아닌 레이저식 도구 세터를 사용 하십시오.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적 입니다.

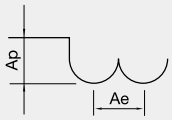
- Use laser tool measurement instead of hydraulic measurement when measuring tool length as possible.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For stainless and heat resistant alloy, water-soluble oil is the most effective.

4VSB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels / Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				티타늄 합금강 Titanium alloy steels Ti6A				내열 합금강 Heat Resistance Alloy				스테인레스강 Stainless Steels SUS304 / SUS316			
	~30HRc				30 ~ 40HRc				-				-				-			
반경 (Radius)	RPM	FEED	Ap Axial	Ae Radial	RPM	FEED	Ap Axial	Ae Radial	RPM	FEED	Ap Axial	Ae Radial	RPM	FEED	Ap Axial	Ae Radial	RPM	FEED	Ap Axial	Ae Radial
0.5R	44,500	1,000	1.00	0.50	37,825	750	1.00	0.50	16,000	600	0.30	0.50	9,550	110	0.30	0.20	25,500	1,000	1.00	0.50
0.6R	37,150	1,250	1.20	0.60	31,578	938	1.20	0.60	13,200	600	0.36	0.60	8,000	100	0.36	0.24	21,000	850	1.20	0.60
0.75R	29.720	1,300	1.50	0.75	25,262	975	1.50	0.75	10,600	600	0.45	0.75	6,300	80	0.45	0.30	17,000	700	1.50	0.75
1R	22.300	1,540	2.00	1.00	18,955	1,155	2.00	1.00	8,000	480	0.60	1.00	3,180	120	0.60	0.40	12,800	760	2.00	1.00
1.25R	17.800	1,650	2.50	1.25	15,130	1,238	2.50	1.25	6,400	380	0.75	1.25	2,500	100	0.75	0.50	10,000	600	2.50	1.25
1.5R	14.860	1,740	3.00	1.00	12,631	1,305	3.00	1.50	5,300	420	0.90	1.50	2,120	90	0.90	0.60	8,500	780	3.00	1.50
2R	11,150	1,624	4.00	2.00	9,478	1,218	4.00	2.00	4,000	300	1.20	2.00	1,590	100	1.20	0.80	6,370	640	4.00	2.00
2.5R	8,910	1,552	5.00	2.50	7,574	1,164	5.00	2.50	3,200	300	1.50	2.50	1,270	90	1.50	1.00	5,100	710	5.00	2.50
3R	7,430	1,450	6.00	3.00	6,316	1,088	6.00	3.00	2,650	300	1.80	3.00	1,000	85	1.80	1.20	4,250	680	6.00	3.00
4R	5,500	1,305	8.00	4.00	4,675	979	8.00	4.00	2,000	240	2.40	4.00	800	70	2.40	1.60	3,190	580	8.00	4.00
5R	4,460	1,160	10.00	5.00	3,791	870	10.00	5.00	1,600	230	3.00	5.00	630	60	3.00	2.00	2,550	500	10.00	5.00
6R	3,710	1,088	12.00	6.00	3,154	816	12.00	6.00	1,320	240	3.60	6.00	530	55	3.60	2.40	2,120	470	12.00	6.00
8R	2,790	885	16.00	8.00	2,372	663	16.00	8.00	1,000	200	4.80	8.00	400	45	4.80	3.20	1,600	390	16.00	8.00
10R	2,230	725	20.00	10.00	1,896	544	20.00	10.00	800	170	6.00	10.00	300	40	6.00	4.00	1,280	320	20.00	10.00
12.5R	1,780	624	25.00	12.50	1,513	468	25.00	12.50	630	150	7.50	12.50	255	35	7.50	5.00	1,000	260	25.00	12.50

절입 기준 Depth of Cut



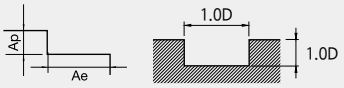
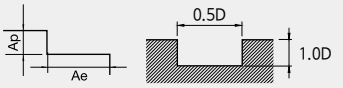
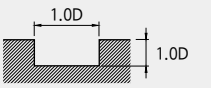
Ap : Axial Depth 축 방향의 절입 깊이(mm)
Ae : Radial Depth 반경 방향의 절입 깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전 속도 (min^{-1})
Vf : Feed 이송 속도 (mm/min)

- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상 , 가공 목적, 적용 기계에 따라 조건 변경 요망 합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 (Ø 1 이하 사용시 진동 허용 관리 5㎛이내일것)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천합니다.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity(1 or less, the vibration tolerance management should be within 5㎛)
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4VSE/4VCC/4VSC Cutting Condition

• RPM : rev./min • Feed : mm/min

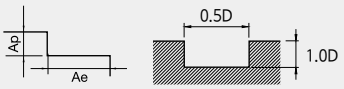
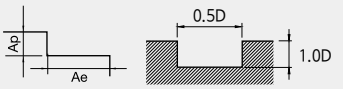
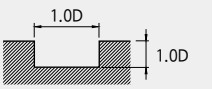
피삭재 Material	구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC				공구강/금형강 Tool steels / Mold steels SCM/HPM				티타늄 합금강 Titanium alloy steels Ti6A				내열 합금강 Heat Resistance Alloys				스테인레스강 Stainless Steels SUS304/SUS316			
	~30HRc				30 ~ 40HRc				-				-				-			
외경 mm Outside Diameter	RPM	FEED	Ap Axial	Ae Radial	RPM	FEED	Ap Axial	Ae Radial	RPM	FEED	Ap Axial	Ae Radial	RPM	FEED	Ap Axial	Ae Radial	RPM	FEED	Ap Axial	Ae Radial
Ø1	41,400	800	1.50	0.50	38,000	690	1.50	0.50	22,920	150	1.00	0.30	10,800	100	1.00	0.20	31,900	380	1.50	0.35
Ø1.2	34,500	700	3.00	0.60	32,000	600	1.80	0.60	19,104	120	1.20	0.36	8,951	80	1.20	0.24	26,500	300	1.80	0.42
Ø1.5	27,600	550	2.25	0.75	25,600	450	2.25	0.75	15,360	100	1.50	0.45	7,155	65	1.50	0.30	21,200	250	2.25	0.53
Ø2	20,700	400	3.00	1.00	19,100	330	3.00	1.00	11,460	80	2.00	0.60	5,400	65	2.00	0.40	15,600	200	3.00	0.70
Ø2.5	16,500	330	3.75	1.25	15,300	270	3.75	1.25	9,120	70	2.50	0.75	4,293	50	2.50	0.50	12,800	150	3.75	0.88
Ø3	13,800	330	4.50	1.50	12,740	240	4.50	1.50	7,644	100	3.00	0.90	3,578	50	3.00	0.60	10,600	210	4.50	1.05
Ø4	10,350	410	6.00	2.00	9,560	405	6.00	2.00	5,736	160	4.00	1.20	2,700	40	4.00	0.80	8,000	150	6.00	1.40
Ø5	8,280	430	7.50	2.50	7,600	450	7.50	2.50	4,584	230	5.00	1.50	2,160	60	5.00	1.00	6,380	250	7.50	1.75
Ø6	6,900	550	9.00	3.00	6,400	450	9.00	3.00	3,840	250	6.00	1.80	1,782	116	6.00	1.20	5,300	420	9.00	2.10
Ø8	5,180	600	12.00	4.00	4,780	420	12.00	4.00	2,868	320	8.00	2.40	1,350	116	8.00	1.60	4,000	180	12.00	2.80
Ø10	4,140	780	15.00	5.00	4,140	600	15.00	5.00	2,400	380	10.00	3.00	1,080	131	10.00	2.00	3,180	510	15.00	3.50
Ø12	3,450	800	18.00	6.00	3,440	600	18.00	6.00	1,920	400	12.00	3.60	891	145	12.00	2.40	2,650	530	18.00	4.20
Ø16	2,600	700	24.00	8.00	2,600	600	24.00	8.00	1,440	350	16.00	4.80	675	131	16.00	3.20	2,000	400	24.00	5.60
Ø20	2,000	700	30.00	10.00	2,000	540	30.00	10.00	1,200	320	20.00	6.00	540	116	20.00	4.00	1,600	320	30.00	7.00
절입 기준 Depth of Cut	Side Milling • Ap : Axial Depth • Ae : Radial Depth 								Side Milling • Ap : Axial Depth • Ae : Radial Depth 											

- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상 , 가공 목적, 적용 기계에 따라 조건 변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 (Ø 1 이하 사용시 진동 허용 관리 5㎛이내일것)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity(1 or less, the vibration tolerance management should be within 5㎛)
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

6VSE/6VSC Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC				공구강/금형강 Tool steels / Mold steels SCM/HPM				티타늄 합금강 Titanium alloy steels Ti6A				내열 합금강 Heat Resistance Alloys				스테인레스강 Stainless Steels SUS304/SUS316			
	~30HRc				30 ~ 40HRc				-				-				-			
외경 mm Outside Diameter	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	RPM	FEED	Ap Axial Depth	AE Radial Depth
Ø3	21,000	5,200	6.0	0.20	18,500	2,000	6.0	0.20	7,400	900	4.5	0.2	2,860	280	4.5	0.2	5,600	1,350	6.0	0.20
Ø4	18,000	5,750	8.0	0.20	16,000	2,410	8.0	0.20	6,850	930	6.0	0.2	2,100	300	6.0	0.2	5,950	1,650	8.0	0.20
Ø5	15,200	6,100	10.0	0.30	13,500	2,850	10.0	0.30	6,100	1,050	7.5	0.3	1,850	360	7.5	0.3	6,300	1,800	10.0	0.30
Ø6	14,500	6,300	12.0	0.30	12,000	3,100	12.0	0.30	5,800	1,150	9.0	0.3	1,700	385	9.0	0.3	6,800	2,000	12.0	0.30
Ø8	12,000	8,150	14.0	0.40	8,500	3,900	14.0	0.40	4,350	1,350	10.5	0.4	1,450	420	10.5	0.4	5,400	2,300	14.0	0.40
Ø10	9,500	7,950	20.0	0.50	7,250	4,100	20.0	0.50	3,400	1,500	15.0	0.5	1,000	460	15.0	0.5	4,850	2,400	20.0	0.50
Ø12	8,200	7,800	24.0	0.60	5,900	4,250	24.0	0.60	2,850	1,650	18.0	0.6	900	490	18.0	0.6	3,900	2,600	24.0	0.60
Ø16	6,200	6,800	32.0	0.80	4,250	3,950	32.0	0.80	2,450	1,350	24.0	0.8	750	400	24.0	0.8	2,800	2,000	32.0	0.80
Ø20	4,850	6,650	40.0	1.00	3,650	3,650	40.0	1.00	1,950	1,200	30.0	1.0	580	360	30.0	1.0	2,650	1,700	40.0	1.00
절입 기준 Depth of Cut	Side Milling • Ap : Axial Depth • Ae : Radial Depth 								Side Milling • Ap : Axial Depth • Ae : Radial Depth 											

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- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오.

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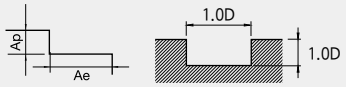
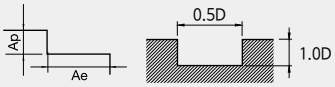
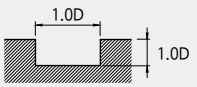
- The edge the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity(1 or less, the vibration tolerance management should be within 5㎛)
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

5VCC Cutting Condition

• RPM : rev./min • Feed : mm/min

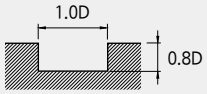
피삭재 Material	구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels / Gray cast irons SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				티타늄 합금강 Titanium alloy steels Ti6A				내열 합금강 Heat Resistance Alloys				스테인레스강 Stainless Steels SUS304 / SUS316			
	~30HRc				30 ~ 40HRc				-				-				-			
외경 mm Outside Diameter	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	RPM	FEED	Ap Axial Depth	AE Radial Depth
Ø6	12,000	3,025	9.0	0.3	8,000	2,020	9.0	3.0	5,180	525	6.00	1.80	1,890	186	6.00	1.20	5,930	1,600	9.0	2.10
Ø8	9,000	3,300	12.0	0.4	5,900	2,300	12.0	4.0	3,800	670	8.00	2.40	1,430	186	8.00	1.60	4,480	1,820	12.0	2.80
Ø10	7,200	4,290	15.0	0.5	5,100	2,700	15.0	5.0	3,240	800	10.00	3.00	1,145	209	10.00	2.00	3,560	1,940	15.0	3.50
Ø12	6,000	4,400	18.0	0.6	4,300	2,700	18.0	6.0	2,590	840	12.00	3.60	945	230	12.00	2.40	2,970	2,000	18.0	4.20
Ø14	8,300	4,150	21.0	0.7	3,840	2,700	21.0	7.0	2,300	790	14.00	4.20	820	220	14.00	2.80	2,540	1,780	21.0	4.90
Ø16	4,500	3,850	24.0	0.8	3,250	2,700	24.0	8.0	1,900	735	16.00	4.80	715	210	16.00	3.20	2,240	1,520	24.0	5.60
Ø18	3,950	3,850	27.0	0.9	2,860	2,560	27.0	9.0	1,750	700	18.00	5.40	630	195	18.00	3.60	2,010	1,350	27.0	6.30
Ø20	3,480	3,850	30.0	1.0	2,500	2,430	30.0	10.0	1,620	670	20.00	6.00	570	185	20.00	4.00	1,800	1,220	30.0	7.00
절입 기준 Depth of Cut	Side Milling • Ap : Axial Depth • Ae : Radial Depth								Side Milling • Ap : Axial Depth • Ae : Radial Depth											

- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오
- 날 경의 코너C 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상 , 가공 목적, 적용 기계에 따라 조건 변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 (Ø 1 이하 사용시 진동 허용 관리 5㎛이내일것)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공 시의 발열과 발화에 주의하십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Set ae figure considering Corner C figure of diameter.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Use a machine with low vibration and good rigidity(1 or less, the vibration tolerance management should be within 5㎛)
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4SLE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M 40~45HRC				스테인레스강 / 티타늄 합금강 Stainless Steels / Titanium alloy steels SUS304 / SUS316 / Ti6A				내열합금강 Heat Resistance Alloys			
	40 ~ 45HRc				-				-			
외경 Outside Diameter	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 3	13,270	740	2.4	3.0	5,840	260	2.4	3.0	3,185	115	2.4	3.0
ø 4	9,950	710	3.2	4.0	4,380	245	3.2	4.0	2,390	115	3.2	4.0
ø 6	6,630	720	4.8	6.0	2,920	245	4.8	6.0	1,590	115	4.8	6.0
ø 8	4,970	800	6.4	8.0	2,190	245	6.4	8.0	1,190	115	6.4	8.0
ø 10	3,980	800	8.0	10.0	1,750	245	8.0	10.0	955	115	8.0	10.0
ø 12	3,320	800	9.6	12.0	1,460	245	9.6	12.0	796	115	9.6	12.0
ø 16	2,490	800	12.8	16.0	1,095	245	12.8	16.0	597	115	12.8	16.0
ø 20	1,990	800	16.0	20.0	880	245	16.0	20.0	480	115	16.0	20.0
절입량 Depth of Cut												

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP & DOWN 하여 설정 하십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
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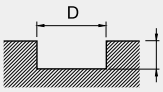
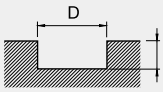
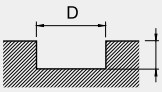
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

7SUC Cutting Condition

• RPM : rev./min • Feed : mm/min

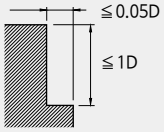
피삭재 Material	합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M 40~45HRC				스테인레스강 / 티타늄 합금강 Stainless Steels / Titanium alloy steels SUS304 / SUS316 / Ti6A				내열합금강 Heat Resistance Alloys			
	40 ~ 45HRc				-				-			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 6	4,070	925	6	6	4,070	550	3	6	1,430	200	1.2	6
ø 8	3,080	838	8	8	3,080	488	4	8	1,100	163	1.6	8
ø 10	2,420	663	10	10	2,420	438	5	10	880	163	2	10
ø 12	2,090	663	12	12	2,090	375	6	12	726	138	2.4	12
ø 16	1,540	488	16	16	1,540	350	8	16	550	100	3.2	16
ø 20	1,210	438	20	20	1,210	325	10	20	440	75	4	20
절입량 Depth of Cut	 ≦1D (MAX. 12mm)				 ≦0.5D				 ≦0.2D			

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

5&6TROE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				스테인레스강 / 티타늄 합금강 Stainless Steels / Titanium alloy steels SUS304 / SUS316 / Ti6A				내열합금강 Heat Resistance Alloys			
	40 ~ 45HRc				-				-			
외경 Outside Diameter	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 6	3,700	450	6	0.3	3,200	380	6	0.3	1,100	65	6	0.3
ø 8	2,800	400	8	0.4	2,350	420	8	0.4	950	60	8	0.4
ø 10	2,250	325	10	0.5	1,990	350	10	0.5	750	60	10	0.5
ø 12	1,990	300	12	0.6	1,550	270	12	0.6	600	55	12	0.6
ø 16	1,550	250	16	0.8	1,250	250	16	0.8	500	50	16	0.8
ø 20	1,200	180	20	1	900	150	20	1	350	50	20	1
절입량 Depth of Cut	 ≦0.05D ≦1D											

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

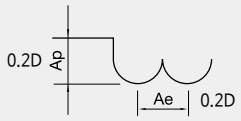
- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- Use 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

2GBE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material		흑연 Graphite			
반경 Radius	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.25	5	25,000	320	0.10	0.10
R 0.5	10	21,850	380	0.20	0.20
〃	20	19,665	342	0.18	0.18
〃	30	18,682	325	0.15	0.15
R 0.75	10	21,850	646	0.30	0.30
〃	20	19,665	630	0.27	0.27
〃	30	18,682	580	0.23	0.23
R 1	15	19,950	760	0.40	0.40
〃	20	17,955	684	0.36	0.36
〃	30	16,160	616	0.32	0.32
〃	40	13,736	523	0.26	0.26
〃	50	10,988	419	0.21	0.21
R 1.5	20	17,575	1,378	0.60	0.60
〃	30	15,818	1,240	0.54	0.54
〃	40	14,236	1,116	0.49	0.49
〃	50	12,100	948	0.44	0.44
R 2	20	15,200	1,995	0.80	0.80
〃	35	13,680	1,796	0.72	0.72
〃	45	12,312	1,616	0.61	0.61
R 2.5	25	14,725	2,423	1.00	1.00
〃	50	11,780	1,938	0.80	0.80
R 3	25	14,250	2,803	1.20	1.20
R 4	30	12,350	2,850	1.60	1.60
R 5	-	10,925	2,898	2.00	2.00
R 6	-	9,975	2,993	2.40	2.40
R 8	-	7,600	2,375	3.20	3.20
R 10	-	6,175	1,900	4.00	4.00

절입량 Depth of Cut



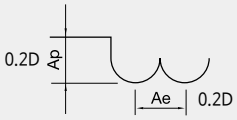
- 유효장이 긴 경우에는 회전수와 이송속도를 최대20% 이하로 줄이십시오.
- 절삭 조건표에 없는 유효장은 같은 직경과 비례하여 DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.

- In case of long effective length, reduce the RPM and feed by 20% or less.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

2TGB Cutting Condition

피삭재 Material		흑연 Graphite				
반경 Radius	유효장 Effective Length	Angle θ	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	20	0°30	18,000	300	0.20	0.20
〃	30	0°30	17,100	285	0.18	0.18
〃	40	0°30	16,245	271	0.16	0.16
〃	25	1°	16,740	279	0.20	0.20
〃	35	1°	15,903	265	0.18	0.18
〃	50	1°	15,108	252	0.16	0.16
R 0.75	30	0°30	17,000	320	0.30	0.30
〃	40	0°30	16,150	304	0.28	0.28
〃	50	0°30	15,343	289	0.26	0.26
〃	30	1°	15,300	288	0.30	0.30
〃	50	1°	14,229	268	0.28	0.28
〃	60	1°	13,233	249	0.26	0.26
R 1	40	0°30	16,500	600	0.40	0.40
〃	50	0°30	14,850	540	0.36	0.36
〃	70	0°30	13,365	486	0.32	0.32
〃	60	1°	12,029	437	0.36	0.36
〃	90	1°	10,224	372	0.32	0.32
R 2	70	0°30	13,500	1,600	0.80	0.80
〃	80	1°	12,825	1,520	0.76	0.76
R 3	100	0°30	11,000	2,200	1.20	1.20
〃	100	1°	10,780	2,156	1.20	1.20
R 5	83	0°30	9,600	2,250	2.00	2.00
R 6	110	0°30	7,500	2,300	2.40	2.40

절입량 Depth of Cut

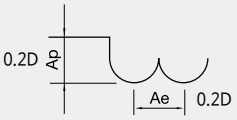


3TBD

• RPM : rev./min • Feed : mm/min

피삭재 Material		흑연 Graphite				
반경 Radius	유효장 Effective Length	Angle θ	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	20	0°30	18,900	360	0.20	0.20
〃	30	0°30	17,955	342	0.18	0.18
〃	40	0°30	17,057	325	0.16	0.16
〃	25	1°	17,577	335	0.20	0.20
〃	35	1°	16,698	318	0.18	0.18
〃	50	1°	15,863	302	0.16	0.16
R 0.75	30	0°30	17,850	384	0.30	0.30
〃	40	0°30	16,958	365	0.28	0.28
〃	50	0°30	16,110	347	0.26	0.26
〃	40	1°	16,065	346	0.30	0.30
〃	50	1°	14,940	321	0.28	0.28
〃	60	1°	13,895	299	0.26	0.26
R 1	40	0°30	17,325	720	0.40	0.40
〃	50	0°30	15,593	648	0.36	0.36
〃	60	0°30	14,702	559	0.32	0.32
〃	50	1°	14,524	588	0.36	0.36
〃	60	1°	12,630	525	0.32	0.32
〃	70	1°	11,367	472	0.19	0.19
R 2	80	0°30	13,466	1,824	0.80	0.80
〃	100	1°	12,120	1,642	0.76	0.76

절입량 Depth of Cut

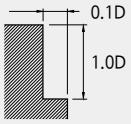


- 유효장이 긴 경우에는 회전수와 이송속도를 최대20% 이하로 줄이십시오.
- 절삭조건표에 없는 유효장은 같은 직경과 비례하여 DOWN 시켜주십시오.
- 절삭조건에 없는 각도는 같은 직경에 이전 각도와 비례하여 사용 하십시오.
- 이송속도 및 축 방향의 절입 깊이는 리브창과 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.

- In case of long effective length, reduce the RPM and feed by 20% or less.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- If there is no parameter for the angle of your tool, refer to the previous angle, and adjust compare to it.
- Adjust the value of the feed and Ap based on the effective length and taper angle, and adjust the milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

2GEM/4GEM/6GEM Cutting Condition

• RPM : rev./min • Feed : mm/min

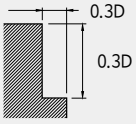
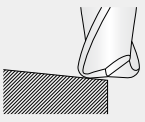
	2GEM				4GEM				6GEM			
피삭재 Material	흑연 Graphite				흑연 Graphite				흑연 Graphite			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 1	36,000	700	1.00	0.10	-	-	-	-	-	-	-	-
ø 2	28,000	700	2.00	0.20	-	-	-	-	-	-	-	-
ø 3	18,000	800	3.00	0.30	18,000	1,600	3.00	0.30	-	-	-	-
ø 4	16,000	1,000	4.00	0.40	16,000	2,000	4.00	0.40	-	-	-	-
ø 5	15,000	1,200	5.00	0.50	15,000	2,400	5.00	0.50	-	-	-	-
ø 6	12,000	1,300	6.00	0.60	12,000	2,600	6.00	0.60	23,400	2,880	6.00	0.60
ø 8	10,000	1,500	8.00	0.80	10,000	3,000	8.00	0.80	19,500	3,900	8.00	0.80
ø 10	8,000	1,400	10.00	1.00	8,000	2,800	10.00	1.00	15,600	4,800	10.00	1.00
ø 12	6,500	1,400	12.00	1.20	6,500	2,800	12.00	1.20	12,675	4,800	12.00	1.20
ø 16	5,800	1,300	16.00	1.60	5,800	2,600	16.00	1.60	11,310	5,400	16.00	1.60
ø 20	5,000	1,200	20.00	2.00	5,000	2,400	20.00	2.00	9,750	5,400	20.00	2.00
절입량 Depth of Cut												

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 흑연 가공시 에어브로를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contac measuring method.
- 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, or found red heat on the material, 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㎛).
- For graphite milling, air blow method is recommended.

2DCR/4DCR Cutting Condition

• RPM : rev./min • Feed : mm/min

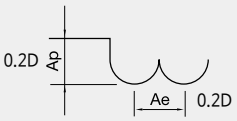
	2DCR				4DCR			
피삭재 Material	흑연 Graphite				흑연 Graphite			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.2	40,000	100	0.06	0.06	-	-	-	-
ø 0.4	40,000	230	0.12	0.12	-	-	-	-
ø 0.5	40,000	300	0.15	0.15	-	-	-	-
ø 0.6	40,000	400	0.18	0.18	-	-	-	-
ø 0.8	40,000	630	0.24	0.24	-	-	-	-
ø 1	35,000	800	0.30	0.30	-	-	-	-
ø 2	25,000	920	0.60	0.60	25,000	1,840	0.60	0.60
ø 3	16,500	920	0.90	0.90	16,500	1,840	0.90	0.90
ø 4	15,000	1,300	1.20	1.20	15,000	2,600	1.2	1.2
ø 5	14,000	1,600	1.50	1.50	-	-	-	-
ø 6	11,000	1,700	1.80	1.80	11,000	3,390	1.8	1.8
ø 8	-	-	-	-	8,000	2,030	2.4	2.4
ø 10	-	-	-	-	6,500	1,700	3.0	3.0
ø 12	-	-	-	-	5,500	1,700	3.6	3.6
ø 16	-	-	-	-	5,500	1,500	4.8	4.8
절입량 Depth of Cut					 경사진면절삭 Inclined Cutting			

- 유효장이 긴 경우에는 회전수와 이송속도를 최대20% 이하로 줄이십시오.
- 곡면 절삭시 날경의 코너R 보다 낮은 이동 PITCH를 설정 하십시오.
- 곡면 절삭시 안정적인 속도 내에서 피드를 최대 50%까지 UP 해주십시오.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적절한 쿨런트 사용과 가공시 발열, 발화에 주의 하십시오.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- For curved milling, set up the lower value of the pitch than the corner radius value of tool diameter.
- For curved milling, raise up the feed up to 50% in stable milling condition.
- For groove milling, set up the Ae value by considering of corner radius value.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Use the adequate coolant for work material and machining geometry and note for heat and ignition.

2DBE/3DBE/4DBE Cutting Condition

• RPM : rev./min • Feed : mm/min

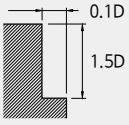
	2DBE				3DBE				4DBE			
피삭재 Material	흑연 Graphite				흑연 Graphite				흑연 Graphite			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 1	16,000	400	0.20	0.20	16,000	480	0.20	0.20	16,000	700	0.20	0.20
ø 2	16,000	800	0.40	0.40	16,000	960	0.40	0.40	16,000	1,200	0.40	0.40
ø 3	16,000	1,450	0.60	0.60	16,000	1,740	0.60	0.60	16,000	2,000	0.60	0.60
ø 4	16,000	2,100	0.80	0.80	16,000	2,520	0.80	0.80	16,000	3,100	0.80	0.80
ø 5	15,500	2,550	1.00	1.00	15,500	3,060	1.00	1.00	15,000	3,800	1.00	1.00
ø 6	15,000	2,950	1.20	1.20	15,000	3,540	1.20	1.20	15,000	4,400	1.20	1.20
ø 8	13,000	3,000	1.60	1.60	13,000	3,600	1.60	1.60	13,000	4,500	1.60	1.60
ø 10	11,500	3,000	2.00	2.00	12,000	3,600	2.00	2.00	12,000	4,600	2.00	2.00
ø 12	10,700	3,200	2.40	2.40	10,000	3,840	2.40	2.40	10,000	4,700	2.40	2.40
절입량 Depth of Cut												

- 유효장이 긴 경우에는 회전수와 이송속도를 최대20% 이하로 줄이십시오.
- 절삭 조건표에 없는 유효장은 같은 직경과 비례하여 DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공형상, 가공목적, 적용기계에 따라 조건변경 요망합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할 시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용합니다.

- If the effective length is long, reduce the RPM and feed maximum 20%.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

2DEM/3DEM/4&6DEM Cutting Condition

• RPM : rev./min • Feed : mm/min

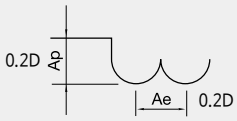
	2DEM				4DEM				6DEM			
피삭재 Material	흑연 Graphite				흑연 Graphite				흑연 Graphite			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.2	40,000	100	0.3	0.02	-	-	-	-	-	-	-	-
ø 0.4	40,000	200	0.6	0.04	-	-	-	-	-	-	-	-
ø 0.6	40,000	350	0.9	0.06	-	-	-	-	-	-	-	-
ø 0.8	40,000	550	1.2	0.08	-	-	-	-	-	-	-	-
ø 1	40,000	700	1.5	0.10	-	-	-	-	-	-	-	-
ø 2	25,000	800	3.0	0.20	-	-	-	-	-	-	-	-
ø 3	16,500	800	4.5	0.30	16,500	1,600	4.5	0.3	-	-	-	-
ø 4	15,000	1,200	6.0	0.40	15,000	2,400	6.0	0.4	-	-	-	-
ø 5	14,000	1,400	7.5	0.50	14,000	2,800	7.5	0.5	-	-	-	-
ø 6	11,000	1,500	9.0	0.60	11,000	3,000	9.0	0.6	21,450	6,200	9	0.6
ø 8	8,000	1,800	12.0	0.80	8,000	3,600	12.0	0.8	15,600	7,400	12	0.8
ø 10	6,500	1,200	15.0	1.00	6,500	3,000	15.0	1.0	12,675	6,200	15	1.0
ø 12	5,500	1,500	18.0	1.20	5,500	3,000	18.0	1.2	10,725	6,200	18	1.2
ø 16	5,500	1,300	24.0	1.60	-	-	-	-	10,725	5,300	24	1.6
절입량 Depth of Cut												

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 주세요.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과 하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 흑연 가공시 에어브로를 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- 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, or found red heat on the material, 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㎛).
- For graphite milling, air blow method is recommended.

2CPB Cutting Condition

• RPM : rev./min • Feed : mm/min

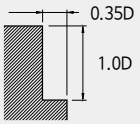
피삭재 Material	CFRP				GFRP			
반경 Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.25	28,000	273	0.05	0.05	13,720	112	0.05	0.05
R 0.3	25,760	315	0.06	0.06	12,622	129	0.06	0.06
R 0.4	18,816	399	0.08	0.08	9,220	164	0.08	0.08
R 0.5	17,920	420	0.1	0.1	8,781	172	0.1	0.1
R 1	17,920	840	0.2	0.2	8,781	344	0.2	0.2
R 2	17,920	2,205	0.4	0.4	8,781	904	0.4	0.4
R 3	16,800	3,098	0.6	0.6	8,232	1,270	0.6	0.6
R 4	14,560	3,150	0.8	0.8	7,134	1,292	0.8	0.8
R 5	12,880	3,360	1	1	6,311	1,378	1	1
R 6	11,200	3,308	1.2	1.2	5,488	1,356	1.2	1.2
절입량 Depth of Cut								

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 유효장에 따라 같은 직경에 비례하여 회전수와 이송속도를 DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공형상, 가공목적, 적용기계에 따라 조건변경 요망합니다.
- 공작기계와 가공물의 강성이 없는 경우, 진동이 발생할 시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the effective length of your tool does not show above the table, use the shorten effevtive length of parameter and reduce the parameters in the same proportion.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.

8 ~12CPE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	CFRP				GFRP			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 6	8,400	840	6	2.1	4116	378	6	2.1
ø 8	6,200	860	8	2.8	3038	387	8	2.8
ø 10	5,100	780	10	3.5	2499	351	10	3.5
ø 12	4,150	750	12	4.2	2034	338	12	4.2
절입량 Depth of Cut								

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 조건은 8날 기준이며 날 수가 증가시 같은 직경에 비례하여 회전수와 이송속도를 UP 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Above the value of the table is based on 8 flutes. If you use more than 8 flutes of endmill, raise up the RPM and Feed in a same proportion compared to the same diameter.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

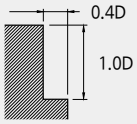
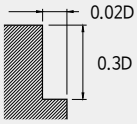
3CPR R-TAC Coating

• RPM : rev./min • Feed : mm/min

피삭재 Material	CFRP			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 6	8,000	600	6	2.4
ø 8	6,000	600	8	3.2
ø 10	4,800	540	10	4.0
ø 12	4,000	540	12	4.8

4&6CPR DIA Coating

• RPM : rev./min • Feed : mm/min

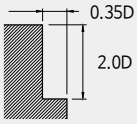
	4CPR								6CPR							
피삭재 Material	CFRP				GFRP				CFRP				GFRP			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 6	7,900	1,100	6	2.4	4,200	430	6	2.4	10,500	1,950	1.8	0.12	5,300	740	1.8	0.12
ø 8	5,960	1,600	8	3.2	3,200	590	8	3.2	7,970	2,950	2.4	0.16	3,900	950	2.4	0.16
ø 10	4,750	1,500	10	4.0	2,550	560	10	4.0	6,350	2,930	3	0.20	3,120	850	3	0.20
ø 12	3,950	2,060	12	4.8	2,120	725	12	4.8	5,300	3,900	3.6	0.24	2,600	1,050	3.6	0.24
절입량 Depth of Cut																

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

6 ~16CPO Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	CFRP				GFRP			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 4	15,900	1,400	8	1.4	15,900	1,400	8	1.4
ø 5	13,000	1,900	10	1.8	13,000	1,900	10	1.8
ø 6	10,600	2,200	12	2.1	10,600	2,200	12	2.1
ø 8	7,950	2,600	16	2.8	7,950	2,600	16	2.8
ø 10	6300	3050	20	3.5	6300	3050	20	3.5
ø 12	5300	3300	24	4.2	5300	3300	24	4.2
절입량 Depth of Cut								

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 조건은 8날 기준이며 날 수가 증가시 같은 직경에 비례하여 회전수와 이송속도를 UP 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- Above the value of the table is based on 8 flutes. If you use more than 8 flutes of endmill, raise up the RPM and Feed in a same proportion compared to the same diameter.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

2DDCA Cutting Condition

• RPM : rev./min • Feed : mm/min

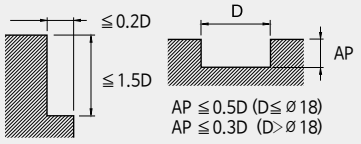
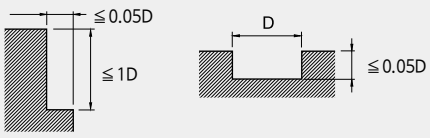
피삭재 Material	CFRP			
외경 Outside Diameter	RPM	FEED	V/C	Fz
ø 2	15,900	960	100 ~ 150	0.03 ~ 0.07
ø 2.5	12,700	760	〃	〃
ø 3	10,600	630	〃	〃
ø 4	7,960	480	〃	〃
ø 5	6,370	380	〃	〃
ø 6	5,300	320	〃	〃
ø 8	3,980	240	〃	〃
ø 9	3,540	210	〃	〃
ø 10	3,180	190	〃	〃
ø 11	2,890	175	〃	〃
ø 12	2,650	160	〃	〃

- 상기조건은V/C 100 , Fz 0.03 기준이며, 실가공시가공목적, 적용기계에따라조건변경요망합니다.
- 조건표가 기계의 최대 스핀들속도를 초과할 시 스핀들속도와 이송속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오.

- Above the parameters are based on V/C 100 with Fz 0.03. Actual machining can be changed depending on your machining purpose and condition of your machine.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

3SUE Cutting Condition

• RPM : rev./min • Feed : mm/min

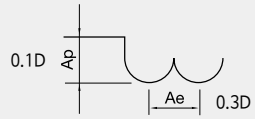
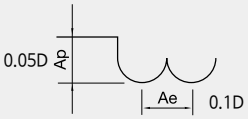
피삭재 Material	스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A				고경도강 STAVAX / SKD11				내열합금강 Heat Resistance Alloys			
경도 Hardness					45 ~ 55HRc							
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.8	6,400	80	1.2	0.16	7,800	210	0.8	0.04	2,000	20	0.8	0.04
ø 1	5,600	90	1.5	0.20	7,000	210	1.0	0.05	1,700	30	1.0	0.05
ø 2	4,800	100	3.0	0.40	5,800	238	1.5	0.08	1,400	40	1.5	0.08
ø 3	4,000	120	4.5	0.60	4,400	315	2.5	0.13	1,400	50	2.5	0.13
ø 4	3,300	180	6.0	0.80	3,600	490	3.0	0.15	1,200	70	3.0	0.15
ø 5	2,700	220	7.5	1.00	3,000	630	4.0	0.20	1,000	90	4.0	0.20
ø 6	2,400	230	9.0	1.20	2,800	630	5.0	0.25	900	90	5.0	0.25
ø 8	1,800	250	12.0	1.50	2,000	700	7.0	0.35	720	80	7.0	0.35
ø 10	1,400	250	14.0	1.80	1,800	770	9.0	0.45	600	80	9.0	0.45
ø 12	1,200	200	17.0	2.00	1,400	630	10.0	0.50	500	70	10.0	0.50
ø 16	900	150	23.0	2.50	1,100	420	15.0	0.75	360	60	15.0	0.75
절입량 Depth of Cut												

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- 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, or found red heat on the material, 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㎛).
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

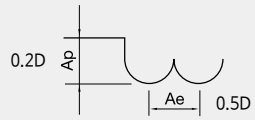
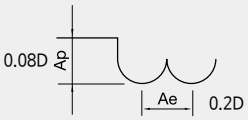
3SURB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				스테인레스강 Stainless Steel SUS304 / SUS316				고경도강 Hardened steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc								45 ~ 55HRc			
반경 Corner 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
R0.5	42000	500	0.10	0.30	25000	220	0.10	0.30	9000	130	0.050	0.10
R0.75	38000	520	0.15	0.45	17000	250	0.15	0.45	7600	185	0.075	0.15
R1	24000	550	0.20	0.60	12700	300	0.20	0.60	6400	225	0.100	0.20
R1.5	16000	600	0.30	0.90	8500	310	0.30	0.90	5460	272	0.150	0.30
R2	12000	530	0.40	1.20	6400	290	0.40	1.20	4160	208	0.200	0.40
R3	8000	350	0.60	1.80	4200	240	0.60	1.80	2730	168	0.300	0.60
R4	5900	270	0.80	2.40	3190	240	0.80	2.40	2080	152	0.400	0.80
R5	4700	200	1.00	3.00	2550	230	1.00	3.00	1690	144	0.500	1.00
R6	4000	180	1.20	3.60	2100	230	1.20	3.60	1430	100	0.600	1.20
절입량 Depth of Cut												

4SUB Cutting Condition

• RPM : rev./min • Feed : mm/min

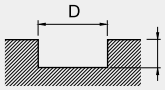
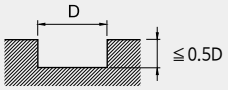
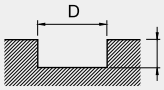
피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				스테인레스강 Stainless Steel SUS304 / SUS316				고경도강 Hardened steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc								45 ~ 55HRc			
반경 Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R1.5	13,860	707	0.3	0.9	9,600	387	0.3	0.9	5040	376	0.15	0.3
R2	10,560	619	0.4	1.2	7,200	354	0.4	1.2	3840	287	0.2	0.4
R2.5	8,382	575	0.5	1.5	5,760	309	0.5	1.5	3000	276	0.25	0.5
R3	6,996	464	0.6	1.8	4,800	287	0.6	1.8	2520	232	0.3	0.6
R4	5,280	420	0.8	2.4	3,600	287	0.8	2.4	1920	210	0.4	0.8
R5	4,224	398	1.0	3.0	2,880	276	1.0	3.0	1560	199	0.5	1.0
R6	3,498	398	1.2	3.6	2,400	276	1.2	3.6	1320	166	0.6	1.2
절입량 Depth of Cut												

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- HRC55 이상 고경도강 가공시 같은 직경의 같은 비율로 20% DOWN 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천 합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- When milling workpiece, HRC over 55 hardened steel , reduce 20% of the RPM and feed compared to the same diameter.
- 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, reduce the RPM and feed in the same proportion.
- Air blow or oil mist is recommended for smooth chip emission.

4SURE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A				내열합금강 Heat Resistance Alloys			
	40 ~ 45HRc											
외경 Outside Diameter	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 1	18000	750	1	1	18000	232	0.5	1	6000	80	0.2	1
ø 2	11740	820	2	2	10920	232	1	2	4990	112	0.4	2
ø 3	8390	900	3	3	8270	352	1.5	3	4370	160	0.6	3
ø 4	6150	800	4	4	6240	400	2	4	3330	184	0.8	4
ø 5	5370	750	5	5	4990	416	2.5	5	2600	208	1	5
ø 6	4480	600	6	6	4130	416	3	6	2180	208	1.2	6
ø 8	3350	580	8	8	3120	392	4	8	1660	208	1.6	8
ø 10	2680	560	10	10	2500	320	5	10	1350	176	2	10
ø 12	2240	530	12	12	2100	320	6	12	1140	144	2.4	12
ø 16	1680	500	16	16	1560	232	8	16	830	112	3.2	16
ø 20	1340	500	20	20	1250	208	10	20	620	80	4	20
절입량 Depth of Cut	 ≦1D (MAX. 12mm)				 ≦0.5D				 ≦0.2D			

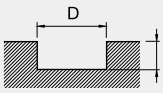
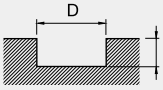
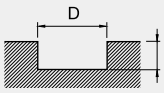
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- 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, or found red heat on the material, 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㎛).
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

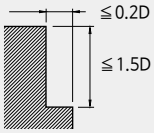
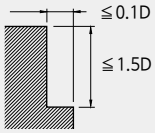
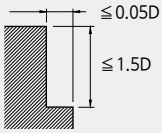
4SUE/4SUC/4SUV Cutting Condition

• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A				내열합금강 Heat Resistance Alloys			
	40 ~ 45HRc											
외경 Outside Diameter	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 2	10,000	400	2	2	9,600	310	1	2	3,200	80	0.4	2
ø 3	6,900	410	3	3	7,400	380	1.5	3	2,700	110	0.6	3
ø 4	5,600	490	4	4	5,600	400	2	4	2,000	120	0.8	4
ø 5	4,500	630	5	5	4,500	410	2.5	5	1,600	130	1	5
ø 6	3,700	740	6	6	3,700	440	3	6	1,300	160	1.2	6
ø 7	3,200	700	7	7	3,200	410	3.5	7	1,100	140	1.4	7
ø 8	2,800	670	8	8	2,800	390	4	8	1,000	130	1.6	8
ø 9	2,500	600	9	9	2,500	350	4.5	9	900	130	1.8	9
ø 10	2,200	530	10	10	2,200	350	5	10	800	130	2	10
ø 11	2,000	530	11	11	2,000	320	5.5	11	720	120	2.2	11
ø 12	1,900	530	12	12	1,900	300	6	12	660	110	2.4	12
ø 16	1,400	390	16	16	1,400	280	8	16	500	80	3.2	16
ø 20	1,100	350	20	20	1,100	260	10	20	400	60	4	20
절입량 Depth of Cut	 ≦1D (MAX. 12mm)				 ≦0.5D				 ≦0.2D			

측면절삭 Side Cutting

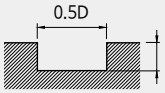
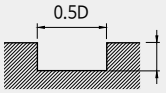
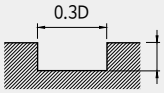
피삭재 Material	합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A				내열합금강 Heat Resistance Alloys			
	40 ~ 45HRc											
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 2	21,000	825	3	0.4	14,000	420	3	0.2	4,800	130	3	0.1
ø 3	15,000	938	4.5	0.6	10,600	638	4.5	0.3	4,200	200	4.5	0.15
ø 4	11,000	1,050	6	0.8	8,000	720	6	0.4	3,200	220	6	0.2
ø 5	9,600	1,425	7.5	1	6,400	750	7.5	0.5	2,500	250	7.5	0.25
ø 6	8,000	1,650	9	1.2	5,300	750	9	0.6	2,100	250	9	0.3
ø 7	6,800	1,425	10.5	1.4	4,500	750	10.5	0.7	1,800	260	10.5	0.35
ø 8	6,000	1,200	12	1.6	4,000	720	12	0.8	1,600	260	12	0.4
ø 9	5,300	1,110	13.5	1.8	3,500	630	13.5	0.9	1,400	220	13.5	0.45
ø 10	4,800	1,080	15	2	3,200	578	15	1	1,300	210	15	0.5
ø 11	4,400	1,013	16.5	2.2	2,900	570	16.5	1.1	1,200	190	16.5	0.55
ø 12	4,000	938	18	2.4	2,700	570	18	1.2	1,100	180	18	0.6
ø 16	3,000	855	24	3.2	2,000	420	24	1.6	800	130	24	0.8
ø 20	2,400	645	30	4	1,600	383	30	2	600	100	30	1
절입량 Depth of Cut	 ≦0.2D ≦1.5D				 ≦0.1D ≦1.5D				 ≦0.05D ≦1.5D			

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4SUCR Cutting Condition

• RPM : rev./min • Feed : mm/min

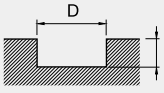
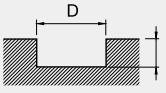
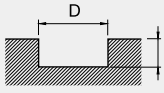
피삭재 Material	합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A				내열합금강 Heat Resistance Alloys			
	40 ~ 45HRc											
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 1	13,210	357	0.3	0.5	10,836	339	0.3	0.5	5,820	78	0.1	0.3
ø 2	11,270	518	0.6	1.0	9,391	339	0.6	1.0	4,840	109	0.2	0.6
ø 3	8,054	588	0.9	1.5	7,112	515	0.9	1.5	4,239	155	0.3	0.9
ø 4	5,904	657	1.2	2.0	5,366	585	1.2	2.0	3,230	178	0.4	1.2
ø 5	5,155	887	1.5	2.5	4,291	608	1.5	2.5	2,522	202	0.5	1.5
ø 6	4,301	1037	1.8	3.0	3,552	608	1.8	3.0	2,115	202	0.6	1.8
ø 8	3,216	749	2.4	4.0	2,683	573	2.4	4.0	1,610	202	0.8	2.4
ø 10	2,573	657	3.0	5.0	2,150	468	3.0	5.0	1,310	171	1.0	3.0
ø 12	2,150	576	3.6	6.0	1,806	468	3.6	6.0	1,106	140	1.2	3.6
ø 16	1,613	541	4.8	8.0	1,342	339	4.8	8.0	805	109	1.6	4.8
ø 20	1,286	404	6.0	10.0	1,075	304	6.0	10.0	601	78	2.0	6.0
절입량 Depth of Cut												

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정 하십시오.
- 날 경의 코너R 대비Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- If the diameter or effective length of your tool are not on the table, adjust it compared similarity value on the table.
- 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, or found red heat on the material, 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㎛).
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

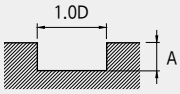
4LSUC Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				스테인레스강 / 티타늄 합금강 Stainless Steel / Titanium alloy steels SUS304 / SUS316 / Ti6A				내열합금강 Heat Resistance Alloys			
	40 ~ 45HRc											
외경 Outside Diameter	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 1	14,300	380	0.5	1	9,600	310	0.5	1	4,770	80	0.2	1
ø 2	8,500	400	1.0	2	9,600	310	1.0	2	3,000	100	0.4	2
ø 3	6,900	410	1.5	3	7,400	380	1.5	3	2,700	110	0.6	3
ø 4	5,600	490	2.0	4	5,600	400	2.0	4	2,000	120	0.8	4
ø 5	4,500	630	2.5	5	4,500	410	2.5	5	1,600	130	1.0	5
ø 6	3,700	740	3.0	6	3,700	440	3.0	6	1,300	160	1.2	6
ø 7	3,200	700	3.5	7	3,200	410	3.5	7	1,100	140	1.4	7
ø 8	2,800	670	4.0	8	2,800	390	4.0	8	1,000	130	1.6	8
ø 10	2,200	530	5.0	10	2,200	350	5.0	10	800	130	2.0	10
ø 11	2,000	530	5.5	11	2,000	320	5.5	11	720	120	2.2	11
ø 12	1,900	530	6.0	12	1,900	300	6.0	12	660	110	2.4	12
ø 16	1,400	390	8.0	16	1,400	280	8.0	16	500	80	3.2	16
ø 20	1,100	350	10.0	20	1,100	260	10.0	20	400	60	4.0	20
절입량 Depth of Cut												

3&4&5SUR Cutting Condition

• RPM : rev./min • Feed : mm/min

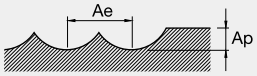
피삭재 Material	스테인레스강/ 티탄합금 Stainless Steels / Titanium Alloy Steels			
	SUS304 / SUS 316 / Ti6A			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 3	5,000	380	0.9	3
ø 4	4,800	350	1.2	4
ø 5	4,700	350	1.5	5
ø 6	4,400	340	1.5	6
ø 7	3,800	340	1.75	7
ø 8	3,300	340	2	8
ø 9	3,000	340	2.25	9
ø 10	2,700	330	2.5	10
ø 12	2,200	330	1.8	12
ø 14	2,000	310	2.1	14
ø 16	1,750	300	2.4	16
ø 20	1,300	210	2	20
절입량 Depth of Cut	 A : Ø3 ~ 5 = 0.3 x D Ø6 ~ 10 = 0.25 x D Ø12 ~ 16 = 0.15 x D Ø18 ~ 20 = 0.1 x D			

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대30% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전 속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.
- 스테인레스, 내열합금강 등의 절단 가공시 수용성 절삭유가 가장 효과적입니다.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- If the effective length is long, reduce the RPM and feed maximum 30%.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.
- For parting off stainless or hear resistant alloy, using water-soluble oil is the most effective way.

2COB Cutting Condition

• RPM : rev./min • Feed : mm/min

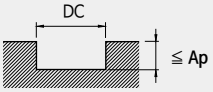
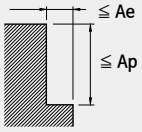
피삭재 Material	동합금 Copper Alloys C1100							
반경 Corner Radius	α≦15°				α>15°			
	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	40,000	5,200	0.06	0.1	40,000	3,200	0.06	0.1
R 0.75	40,000	6,240	0.09	0.15	40,000	4,000	0.09	0.15
R 1	40,000	6,240	0.11	0.2	39,000	4,700	0.11	0.2
R 1.5	40,000	7,800	0.12	0.3	30,000	4,500	0.12	0.3
R 2	40,000	7,800	0.13	0.4	27,000	4,300	0.13	0.4
R 2.5	32,000	7,150	0.15	0.5	20,000	3,600	0.15	0.5
R 3	25,000	5,850	0.2	0.6	16,000	2,900	0.2	0.6
R 4	21,000	5,460	0.25	0.8	13,000	2,600	0.25	0.8
R 5	16,000	4,160	0.3	1	10,000	2,000	0.3	1
R 6	13,000	3,380	0.5	1.2	8,000	1,700	0.5	1.2
R 8	9,000	2,340	0.5	1.6	6,000	1,300	0.5	1.6
절입량 Depth of Cut								

- α란 가공면의 경사각입니다.
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 원활한 칩배출을 위하여 수용성 절삭유제의 사용을 추천합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.

- α value represents a slope of workpiece.
- If the effective length is long, reduce the RPM and feed in the same proportion.
- Using Water-soluble oil is recommended for smooth chip emission.
- If the parameters exceed the maximum RPM and feed of your machine, reduce the RPM and feed in the same proportion.

2COR/3COR Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material			홈절삭 Slotting				측면절삭 Side Cutting			
			동/ 동합금 C1100 Copper / Copper Alloys				동/ 동합금 C1100 Copper / Copper Alloys			
외경 Outside Diameter	반경 Corner Radius	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ap Radial Depth	RPM	FEED	Ap Axial Depth	Ap Radial Depth
ø 1	R0.1, R0.2	3	45,000	2,500	0.036	1	45,000	4,500	0.036	0.2
〃	〃	6	40,000	2,000	0.03	1	40,000	3,000	0.03	0.2
〃	〃	10	35,000	1,600	0.025	1	35,000	2,000	0.025	0.2
ø 1.5	R0.1, R0.2	5	23,000	1,800	0.08	1.5	50,000	6,000	0.08	0.3
〃	〃	8	26,000	1,600	0.06	1.5	45,000	5,500	0.06	0.3
〃	〃	12	30,000	1,500	0.05	1.5	40,000	4,500	0.04	0.3
ø 2	R0.1, R0.2	6	35,000	1,800	0.14	2	45,000	5,000	0.12	0.8
〃	〃	10	30,000	1,600	0.12	2	40,000	4,700	0.1	0.6
〃	〃	14	30,000	1,200	0.08	2	30,000	3,800	0.06	0.4
ø 3	R0.2, R0.3	10	30,000	2,200	0.14	3	40,000	6,500	0.12	1
〃	〃	16	20,000	2,000	0.12	3	35,000	6,000	0.1	0.6
〃	〃	20	20,000	2,000	0.12	3	35,000	6,000	0.1	0.6
〃	R0.5	10	20,000	2,600	0.14	3	38,000	10,000	0.12	0.8
〃	〃	16	20,000	2,200	0.12	3	35,000	8,000	0.1	0.6
〃	〃	20	20,000	2,200	0.12	3	35,000	8,000	0.1	0.6
ø 4	R0.2, R0.3	12	20,000	2,600	0.5	4	40,000	8,000	0.18	0.12
〃	〃	16	15,000	2,400	0.3	4	32,000	5,000	0.16	0.1
〃	〃	20	15,000	2,000	0.25	4	32,000	5,000	0.15	0.8
〃	R0.5	12	20,000	2,400	0.5	4	35,000	10,000	0.3	0.1
〃	〃	16	15,000	2,200	0.25	4	32,000	7,000	0.15	0.8
〃	〃	20	15,000	2,200	0.25	4	32,000	7,000	0.15	0.8
ø 6	R0.3, R0.5	20	10,000	1,400	0.6	6	20,000	5,200	0.25	1.2
〃	〃	30	10,000	1,200	0.4	6	20,000	5,000	0.25	1.2
〃	R10	20	10,000	1,800	0.6	6	20,000	9,000	0.25	1.2
〃	〃	30	10,000	1,500	0.4	6	20,000	7,000	0.25	1.2
ø 8	R0.3, R0.5	25	8,000	1,000	0.3	8	15,000	5,000	0.3	1.5
〃	R1	25	8,000	1,300	0.3	8	15,000	10,000	0.3	1.5
ø 10	R0.5	30	7,000	1,300	0.3	10	13,000	7,000	0.2	1.5
〃	R1.0	30	7,000	1,500	0.3	10	13,000	12,000	0.2	1.5
ø 12	R0.5	35	6,000	1,100	0.2	12	10,000	9,000	0.15	2
〃	R1.0	35	6,000	1,300	0.2	12	10,000	15,000	0.15	2
절입량 Depth of Cut										

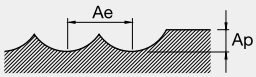
- 절삭 시 코너R 부분을 참고하여 절삭하시기 바랍니다.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 위 절삭 조건은 2날 절삭 조건이며, 3날 가공 시 회전수는 유지하고, 피드는 안정적인 속도내에서 최대 20%까지 UP 해주십시.
- 홈 절삭 시 날 경의 코너R 대비 Ae값을 설정 하십시오.

- Please refer to the corner R when cutting.
- If the effective length is long, reduce the rotation speed and feed rate by up to 20%.
- The above cutting conditions are for 2-flute cutting. For 3-flute cutting, maintain the rotation speed and increase the feed by up to 20% within a stable speed range.
- When cutting grooves, set the Ae value relative to the corner R of the tool's edge.

2DRB Cutting Condition

• RPM : rev./min • Feed : mm/min

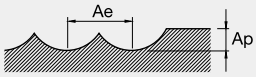
피삭재 Material	알루미늄 합금 Aluminum Alloy Expanding Material AL7075				알루미늄 합금 주물 / 다이캐스팅 Aluminum Alloys Casting / Die Casting AC4B / Si13%				탄소섬유 / 동합금 Magnesium Alloy / Copper Allloy / CFRP AZ91 / AZ80A / C1100		동합금 Copper Allloy C1100	
	일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling	
반경 Radius	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R0.1	32,000	220	45,000	290	32,000	220	45,000	290	32,000	220	45,000	290
R0.3	32,000	480	45,000	660	32,000	480	45,000	660	32,000	480	45,000	660
R0.5	28,800	760	45,000	1,100	28,800	760	45,000	1,100	28,800	760	45,000	1,100
R0.8	28,800	850	45,000	1,400	28,800	850	45,000	1,400	25,200	850	35,900	1,300
R1	28,600	1,400	45,000	2,000	28,600	1,400	43,000	1,900	21,500	1,000	35,900	1,600
R1.5	19,100	1,400	45,000	3,000	19,100	1,400	28,600	1,900	14,300	1,000	23,900	1,600
R2	14,300	1,400	35,900	3,200	14,300	1,400	21,400	1,900	10,700	1,000	17,900	1,600
R3	9,500	1,400	23,900	3,200	9,500	1,400	14,300	1,900	7,200	1,000	12,000	1,600
R4	7,200	1,800	17,600	4,100	7,200	1,800	10,700	2,400	5,400	1,300	8,900	2,000
R5	5,700	1,600	14,000	3,600	5,700	1,600	8,600	2,200	4,300	1,200	7,200	1,800
R6	4,800	1,500	11,700	3,400	4,800	1,500	7,200	2,000	3,600	1,100	5,900	1,700
절입량 Depth of Cut	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae
	0.1D	0.2D	0.05D	0.1D	0.1D	0.2D	0.05D	0.1D	0.1D	0.2D	0.02D	0.05D



2DLB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	알루미늄 합금 Aluminum Alloy Expanding Material AL7075				알루미늄 합금 주물 / 다이캐스팅 Aluminum Alloys Casting / Die Casting AC4B / Si13%				탄소섬유 / 동합금 Magnesium Alloy / Copper Allloy / CFRP AZ91 / AZ80A / C1100		동합금 Copper Allloy C1100	
	일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling	
반경 Radius	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R0.3	28,800	350	40,000	490	28,800	350	36,100	480	28,800	350	31,600	420
R0.5	23,400	720	31,500	950	23,400	720	25,200	900	23,400	720	20,700	800
R0.8	23,400	760	35,900	1,120	23,400	760	25,200	1,000	22,500	720	20,700	800
R1	22,500	950	31,500	1,260	22,500	950	25,200	1,100	17,100	720	20,700	800
R1.5	15,300	950	20,700	1,260	15,300	950	16,700	1,100	11,300	720	13,500	800
R2	11,300	950	15,800	1,260	11,300	950	12,600	1,100	8,600	720	10,400	800
R3	9,000	950	13,200	1,260	9,000	950	12,600	1,100	5,900	720	8,900	800
R4	6,400	1,150	11,600	1,260	6,400	1,150	9,800	1,000	4,800	880	6,400	950
R5	5,200	1,050	9,400	1,120	5,200	1,050	7,800	860	3,900	760	5,300	880
R6	4,100	1,000	6,700	950	4,100	1,000	5,400	520	3,000	740	4,600	840
절입량 Depth of Cut	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae
	0.1D	0.2D	0.05D	0.1D	0.1D	0.2D	0.05D	0.1D	0.1D	0.2D	0.02D	0.05D

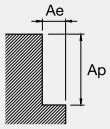
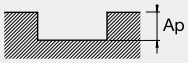


- 상기 절삭조건은 참고 수치이므로 실가공시 가공형상, 가공목적, 적용기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들속도와 이송속도를 비례하여 조정하십시오.
- 에어브로 혹은 미스트 쿨런트를 추천합니다.

- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolant is recommended.

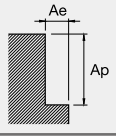
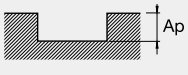
2DRE/3DRE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	알루미늄 합금 Aluminum Alloy Expanding Material AL7075				알루미늄 합금 주물 / 다이캐스팅 Aluminum Alloys Casting / Die Casting AC4B / Si13%				탄소섬유 / 동합금 Magnesium Alloy / Copper Allloy / CFRP AZ91 / AZ80A / C1100		동합금 Copper Allloy C1100	
	일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø 0.5	28,800	160	45,000	500	28,800	160	45,000	450	28,800	140	45,000	410
ø 0.6	28,800	180	45,000	590	28,800	180	45,000	540	28,800	160	45,000	500
ø 0.8	28,800	200	45,000	770	28,800	200	45,000	720	26,100	180	45,000	590
ø 1	28,800	200	45,000	900	28,800	200	45,000	960	20,700	200	37,800	630
ø 1.2	28,800	210	45,000	1,100	28,800	210	45,000	1,000	17,100	200	32,400	630
ø 1.5	28,800	250	45,000	1,400	28,800	250	45,000	1,100	14,000	200	26,600	630
ø 2	28,800	400	45,000	1,800	28,800	380	45,000	1,100	13,000	200	25,200	680
ø 2.5	22,500	540	43,200	1,900	22,500	540	27,900	1,100	8,600	230	18,000	680
ø 3	18,900	630	36,000	1,900	18,900	630	23,400	1,100	7,200	230	15,300	680
ø 4	14,000	650	29,700	2,000	14,000	650	18,000	1,200	5,400	250	12,600	720
ø 5	11,300	680	27,900	2,500	11,300	680	17,280	1,500	4,300	270	11,300	860
ø 6	9,500	750	23,400	2,500	9,500	750	14,310	1,500	3,600	280	9,500	900
ø 8	7,200	800	17,550	2,600	7,200	800	10,800	1,600	2,600	270	7,100	900
ø 10	5,700	900	13,950	2,900	5,700	900	8,640	1,700	2,100	330	5,700	1,000
ø 12	4,800	950	11,700	2,900	4,800	950	7,200	1,700	1,800	350	4,800	1,000
측면절삭 Side Cutting	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae
	1.5D	0.1D	1D	0.1D	1.5D	0.1D	1D	0.1D	1.5D	0.1D	1D	0.05D
홈절삭 Slotting	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae
	0.5D	0.8D	0.15D	0.8D	0.5D	0.8D	0.15D	0.8D	0.5D	0.8D	0.1D	0.8D
절입량 Depth of Cut												

2DLE Cutting Condition

• RPM : rev./min • Feed : mm/min

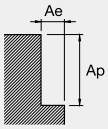
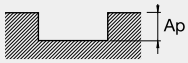
피삭재 Material	알루미늄합금재 Aluminum Alloy Expanding Material A7075				알루미늄합금주물 / 다이캐스팅 Aluminum Alloys Casting / Die Casting AC4B / Si13%				탄소섬유 / 동합금 Magnesium Alloy / Copper Allloy / CFRP AZ91 / AZ80A / C1100		동합금 Copper Allloy C1100	
	일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø 0.1	32,000	35	45,000	120	32,000	35	45,000	120	32,000	35	45,000	100
ø 0.3	32,000	60	45,000	300	32,000	60	45,000	300	32,000	60	45,000	210
ø 0.5	28,800	90	45,000	500	28,800	90	45,000	500	28,800	90	45,000	390
ø 0.8	28,800	120	45,000	700	28,800	130	45,000	700	23,000	110	45,000	500
ø 1	28,800	170	45,000	900	28,800	170	45,000	900	20,700	125	37,800	630
ø 1.5	28,800	230	40,500	1,100	28,800	230	40,500	1,100	14,000	130	26,700	630
ø 2	23,000	270	30,600	1,100	23,000	270	30,600	1,100	10,400	135	21,600	675
ø 3	15,300	460	20,700	1,100	15,300	460	20,700	1,100	7,200	200	15,300	675
ø 4	11,300	470	15,300	1,100	11,300	470	15,300	1,100	5,400	210	11,700	675
ø 5	9,000	490	12,200	1,100	9,000	490	12,200	1,100	4,300	225	9,000	675
ø 6	7,700	540	10,000	1,100	7,700	540	10,000	1,100	3,600	225	7,200	675
ø 8	6,000	600	8,200	1,200	6,000	600	8,200	1,200	2,600	300	5,900	720
ø 10	4,500	650	6,000	1,400	4,500	650	6,000	1,400	2,100	300	4,300	800
ø 12	3,100	690	4,500	1,500	3,100	690	4,500	1,500	1,600	320	3,200	850
측면절삭 Side Cutting	Ap	Ae	Ap	Ap	Ap	Ap	Ap	Ae	Ap	Ae	Ap	Ae
	1.2D	0.1D	1D	0.1D	1.2D	0.1D	1D	0.1D	1D	0.1D	1D	0.05D
홈절삭 Slotting	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae
	0.3D	0.8D	0.15D	0.8D	0.3D	0.8D	0.15D	0.8D	0.3D	0.8D	0.1D	0.8D
절입량 Depth of Cut												

- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망 합니다 (Ø1이하 사용시 진동 허용 관리 5㎛이내 일것.)
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- 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, or found red heat on the material, 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㎛).
- Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

2DLC Cutting Condition

• RPM : rev./min • Feed : mm/min

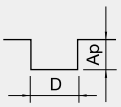
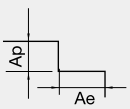
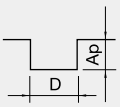
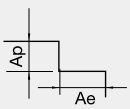
피삭재 Materid	알루미늄 합금 Aluminum Alloy Expanding Material AL7075				알루미늄 합금 주물 / 다이캐스팅 Aluminum Alloys Casting / Die Casting AC4B / Si13%				탄소섬유 / 동합금 Magnesium Alloy / Copper Allloy / CFRP AZ91 / AZ80A / C1100		동합금 Copper Allloy C1100	
	일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø 1	37,500	220	50,000	1,170	37,400	220	50,000	1,170	27,000	160	49,000	820
ø 1.5	37,500	300	50,000	1,430	37,400	300	50,000	1,430	18,000	170	34,700	820
ø 2	30,000	350	40,000	1,430	30,000	350	40,000	1,430	13,500	180	28,000	880
ø 3	20,000	600	27,000	1,430	20,000	600	27,000	1,430	9,400	260	20,000	880
ø 4	15,000	610	20,000	1,430	14,700	610	20,000	1,430	7,000	270	15,200	880
ø 6	10,000	700	13,000	1,430	10,000	700	13,000	1,430	4,700	290	9,400	880
ø 8	7,800	780	11,000	1,560	7,800	780	10,700	1,560	3,400	390	7,700	940
ø 10	5,900	850	7,800	1,820	5,900	850	7,800	1,820	2,700	390	5,600	1,000
ø 12	4,000	900	5,900	1,950	4,000	900	5,900	1,950	2,100	410	4,200	1,100
측면절삭 Side Cutting	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae
	1.2D	0.1D	1D	0.1D	1.2D	0.1D	1D	0.1D	1D	0.1D	1D	0.05D
홈절삭 Slotting	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae	Ap	Ae
	0.3D	0.8D	0.15D	0.8D	0.3D	0.8D	0.15D	0.8D	0.3D	0.8D	0.1D	0.8D
절입량 Depth of Cut												

- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 측면 절삭시 코너R 부분을 참고하여 절삭하시기 바랍니다.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 에어브로 혹은 미스트 쿨런트를 추천하며 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- In case of long effective length, reduce the RPM and feed by 20% or less.
- Refer to the corner radius value for side milling
- 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.
- Air blow or mist coolant is recommended and note for chip emission, heat, or ignition.

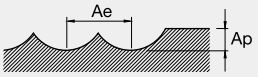
3ALR/3ALE

• RPM : rev./min • Feed : mm/min

피삭재 Materid	알루미늄합금 Aluminum Alloys etc AL7075							
	3ALR Type				3ALE Type			
외경 Outside Diameter	RPM	FEED			RPM	FEED		
		수직 Vertical	홈절삭 Soltting	측면절삭 Side Milling		수직 Vertical	홈절삭 Soltting	측면절삭 Side Milling
ø 1	35,000	150	585	715	32,000	130	501	605
ø 2	30,000	225	1,170	1,398	25,500	190	995	1,170
ø 3	21,600	225	1,300	1,560	18,400	190	1,100	1,300
ø 4	16,200	300	1,300	1,560	14,000	255	1,100	1,300
ø 5	13,000	300	1,300	1,560	11,000	255	1,100	1,300
ø 6	10,800	300	1,300	1,560	9,200	255	1,100	1,300
ø 8	8,100	300	1,300	1,560	7,000	255	1,100	1,300
ø 10	6,480	250	1,300	1,560	5,500	210	1,100	1,300
ø 12	5,400	200	1,300	1,560	4,400	170	1,100	1,300
ø 16	-	-	-	-	3,200	130	995	1,235
ø 20	-	-	-	-	2,000	85	884	1,105
Milling Amount (mm)		Ap=0.75D	Ap=0.75D	Ap=0.75D/ Ae=0.3D		Ap=0.75D	Ap=0.75D	Ap=0.75D/ Ae=0.3D
절입량 Depth of Cut								

2ALB Cutting Condition

• RPM : rev./min • Feed : mm/min

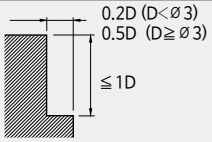
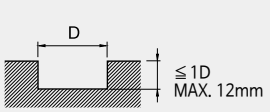
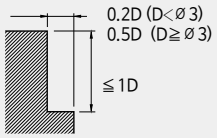
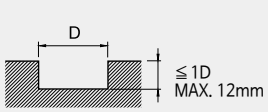
피삭재 Material	알루미늄 합금 Aluminum Alloys AL7075				동합금 Copper Alloys C1100			
반경 Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
0.25R	40,000	700	0.01	0.025	34,000	2,000	0.015	0.05
0.3R	40,000	800	0.012	0.03	34,000	2,300	0.018	0.06
0.4R	40,000	1,050	0.016	0.04	34,000	2,580	0.024	0.08
0.5R	40,000	1,200	0.02	0.05	34,000	2,880	0.03	0.1
0.6R	40,000	1,650	0.024	0.06	34,000	3,250	0.036	0.12
0.75R	40,000	1,950	0.03	0.075	34,000	3,600	0.045	0.15
1R	40,000	2,170	0.04	0.1	33,150	4,230	0.06	0.2
1.25R	37,000	2,250	0.05	0.125	28,500	4,100	0.075	0.25
1.5R	33,125	2,300	0.06	0.15	25,500	4,050	0.09	0.3
2R	23,125	2,450	0.08	0.2	22,950	3,870	0.12	0.4
2.5R	19,125	2,500	0.1	0.25	17,000	3,240	0.15	0.5
3R	16,250	2,500	0.12	0.3	31,600	2,610	0.18	0.6
4R	11,875	2,500	0.16	0.4	11,050	2,340	0.24	0.8
5R	10,000	2,200	0.2	0.5	8,500	2,200	0.3	1
6R	8,125	2,170	0.24	0.6	6,800	2,050	0.36	1.2
8R	7,500	2,000	0.32	0.8	5,100	2,000	0.48	1.6
절입량 Depth of Cut								

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 원활한 칩배출을 위하여 수용성 절삭유제의 사용을 추천합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 용망합니다. (Ø1 이하 사용시 진동 허용 관리 5㎛ 이내일것)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 쿨런트 사용을 추천하며, 동 가공시 습식 쿨런트를 추천합니다.

- If the effective length is long, lower RPM and FEED at the same ratio.
- We recommend using a soluble cutting fluid for smooth chip evacuation.
- If the rotation speed of the applied machine is insufficient, reduce the rotation speed and feed rate at the same ratio.
- The above cutting conditions are numerical values, so they may need to be adjusted depending on the actual machining shape, machining purpose, and applied machine.
- Please use a rigid and low-vibration machine (vibration tolerance within 5㎛ for Ø1 or below).
- For smooth chip evacuation, we recommend using air blow or mist coolant, and for non-ferrous materials, we recommend using wet coolant during machining

2ALE Cutting Condition

• RPM : rev./min • Feed : mm/min

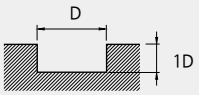
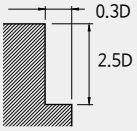
피삭재 Material	알루미늄합금 Aluminum Alloys AL7075				알루미늄 합금 주물 Aluminum Alloys AC4B			
	측면가공 Side Milling		홈가공 Soltting		측면가공 Side Milling		홈가공 Soltting	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø 1	34,000	500	34,000	400	34,000	400	34,000	300
ø 2	34,000	950	32,300	720	32,300	720	27,200	470
ø 3	27,200	1,200	21,300	800	21,300	800	18,000	510
ø 4	20,400	1,300	16,000	850	16,000	850	14,000	550
ø 5	16,200	1,400	13,000	850	13,000	850	11,000	600
ø 6	13,600	1,600	11,000	940	11,000	940	9,400	640
ø 8	10,200	1,600	8,000	1,000	8,000	1,000	6,800	680
ø 10	8,100	1,600	6,500	1,000	6,500	1,000	5,400	680
ø 12	6,800	1,600	5,400	1,000	5,400	1,000	4,500	680
ø 16	5,100	1,600	4,100	1,000	4,100	1,000	3,400	610
ø 20	4,100	1,300	3,200	850	3,200	850	2,700	560
절입량 Depth of Cut								

- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

3FALE Cutting Condition

• RPM : rev./min • Feed : mm/min

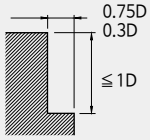
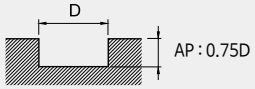
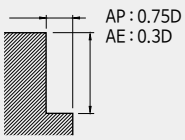
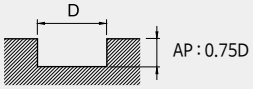
피삭재 Material	홈절삭 Slotting				측면절삭 Side Cutting			
	알루미늄 합금 Aluminum Alloys AL7075				알루미늄 합금 Aluminum Alloys AL7075			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 6	8,000	1,000	6	6	8,000	1,200	15	1.8
ø 8	6,000	1,000	8	8	6,000	1,200	20	2.4
ø 10	4,800	1,000	10	10	4,800	1,200	25	3
ø 12	4,000	1,000	12	12	4,000	1,200	30	3.6
ø 16	3,000	1,000	16	16	3,000	1,200	40	4.8
절입량 Depth of Cut								

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전 속도와 이송 속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

4ALE Cutting Condition

• RPM : rev./min • Feed : mm/min

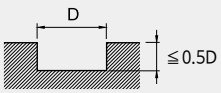
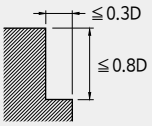
피삭재 Material	알루미늄 합금 Aluminum Alloys AL7075				알루미늄 합금 Aluminum Alloys AL7075			
	측면가공 Side Milling		홈가공 Soltting		측면가공 Side Milling		홈가공 Soltting	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø3	12,800	975	12,880	825	5,796	439	5,796	330
Ø4	9,800	975	9,800	825	4,410	439	4,410	330
Ø5	7,700	975	7,700	825	3,465	439	3,465	330
Ø6	6,440	975	6,440	825	2,898	439	2,898	330
Ø8	4,900	975	4,900	825	2,205	439	2,205	330
Ø10	3,850	975	3,850	825	1,733	439	1,733	330
Ø12	3,080	975	3,080	825	1,386	439	1,386	330
Ø16	2,240	926	2,240	746	1,008	417	1,008	298
Ø20	1,400	829	1,400	663	630	373	630	265
절입량 Depth of Cut								

- 높은 이송속도로 절삭 시 절삭날의 배출되는 칩의 융착되어, 안정적인 절삭조건을 먼저 확인해 해주십시오.
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의하십시오.
- 측면가공 후 좋지않은 표면의 세로결이 생긴다면 홀더의 클램핑과 콜렛의 체결을 확인해주십시오.

- When cutting at a high feed rate, check the stability of the cutting conditions first, as chip adhesion may occur on the cutting edge.
- The cutting edge is precisely ground. To prevent breakage, try to measure without contacting the edge if possible.
- The above cutting conditions are numerical values, so they may need to be adjusted depending on the actual machining shape, machining purpose, and applied machine.
- We recommend using air blow, cutting oil, or oil mist coolant to remove chips effectively and pay attention to heat generation and ignition during machining.
- If vertical lines appear on the surface after side milling, check the clamping of the holder and the fastening of the collet.

3ALC Cutting Condition

• RPM : rev./min • Feed : mm/min

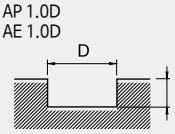
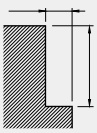
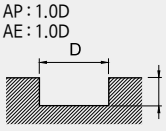
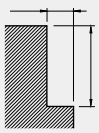
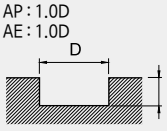
피삭재 Material	홈절삭 Slotting				측면절삭 Side Cutting			
	알루미늄 합금 Aluminum Alloys AL7075				알루미늄 합금 Aluminum Alloys AL7075			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 6	10,000	3,300	3	6	10,000	4,200	4.8	1.8
ø 8	9,000	2,700	4	8	9,000	3,750	6.4	2.4
ø 10	7,500	2,000	5	10	7,500	3,000	8	3
ø 12	6,500	1,600	6	12	6,500	2,700	9.6	3.6
ø 16	5,000	1,600	8	16	5,000	2,700	12.8	4.8
ø 20	4,000	1,500	10	20	4,000	2,500	16	6
절입량 Depth of Cut								

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰 최대 20% 이하로 줄이십시오.
- 측면 절삭시 코너R 부분을 참고하여 절삭 하시기 바랍니다.
- 홈 절삭시 날경의 코너R 대비 Ae 값을 설정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시의 발열과 발화에 주의하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- Refer to the corner radius value for side milling.
- 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.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

3ALCB Cutting Condition

• RPM : rev./min • Feed : mm/min

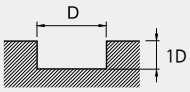
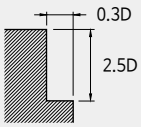
피삭재 Material	알루미늄합금 Aluminum Alloys A7075				알루미늄 합금 주물 Aluminum Alloys AC4B				비철금속 Non-ferrous			
	측면가공 Side Milling		홈가공 Soltting		측면가공 Side Milling		홈가공 Soltting		측면가공 Side Milling		홈가공 Soltting	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Ø3	40,300	3,600	37,000	2,200	26,500	1,600	15,900	1,200	47,700	5,700	40,000	3,600
Ø4	30,250	4,080	27,800	2,500	19,900	2,400	12,000	1,450	35,820	6,450	30,000	4,000
Ø5	25,500	5,080	22,300	2,780	15,900	2,800	9,550	1,720	28,600	6,880	24,200	4,350
Ø6	21,200	5,700	18,500	2,900	13,270	2,900	7,960	1,790	23,800	7,100	20,170	4,800
Ø8	15,900	6,200	14,000	3,700	9,950	2,300	5,970	2,150	17,900	7,500	15,100	5,450
Ø10	12,800	5,700	11,200	4,000	7,960	2,150	4,770	2,290	14,300	8,100	12,100	5,800
Ø12	10,600	5,400	9,250	3,600	6,630	2,980	3,980	2,000	12,000	7,500	10,080	6,050
Ø16	8,560	4,700	7,000	3,100	4,970	2,680	3,000	1,700	8,950	6,780	7,560	5,200
Ø20	6,850	4,100	5,570	2,800	3,980	2,300	2,400	1,450	7,170	5,800	6,050	4,550
절입량 Depth of Cut												

- 가공 진입시 가능 한 피삭재 밖에서 진입 하십시오
- 절삭 조건이 없는 직경 및 유효장은 비슷한 직경 및 유효장에 비례하여 UP&DOWN 하여 설정하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다. (Ø1 이하 사용시 진동 허용 관리 5㎛이내일것.)
- 원활한 칩배출을 위하여 수용성 쿨런트 사용을 추천합니다.

- During tool entry, try to enter from outside the workpiece as much as possible.
- For diameters and effective lengths without specific cutting conditions, set them proportionally UP&DOWN to similar diameters and effective lengths.
- The above cutting conditions are numerical values, so they may need to be adjusted depending on the actual machining shape, machining purpose, and applied machine.
- If the rotation speed of the applied machine is insufficient, reduce the rotation speed and feed rate at the same ratio.
- Please use a rigid and low-vibration machine (vibration tolerance within 5㎛ for Ø1 or below).
- We recommend using a soluble coolant for smooth chip evacuation.

3ARE/3ARC Cutting Condition

• RPM : rev./min • Feed : mm/min

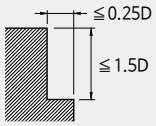
피삭재 Material	동 Copper alloys C1100						알루미늄 합금 Aluminum alloys AL7075					
			홈절삭 Slotting		측면절삭 Side Cutting				홈절삭 Slotting		측면절삭 Side Cutting	
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	Ap Axial Depth	Ae Radial Depth
ø 6	4,200	1,500	6	6	15	1.8	8,000	1,800	6	6	15	1.8
ø 8	3,200	1,500	8	8	20	2.4	6,000	1,800	8	8	20	2.4
ø 10	2,600	1,500	10	10	25	3	4,800	1,800	10	10	25	3
ø 12	2,100	1,500	12	12	30	3.6	4,000	1,800	12	12	30	3.6
ø 16	1,600	1,500	16	16	40	4.8	3,000	1,800	16	16	40	4.8
ø 20	1,300	1,500	20	20	50	6	2,400	1,800	20	20	50	6
절입량 Depth of Cut												

- 가공진입시가능한피삭재밖에서진입하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전 속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

3ARO Cutting Condition

• RPM : rev./min • Feed : mm/min

	측면절삭 Side Cutting							
피삭재 Material	알루미늄 합금 Aluminum Alloys AL7075				알루미늄 합금 주물 Aluminum Alloys AC4B			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 4	22,500	4,200	6	1	16,000	1,800	6	1
ø 5	20,250	4,900	7.5	1.25	14,400	2,000	7.5	1.25
ø 6	18,225	5,500	9	1.5	11,700	2,100	9	1.5
ø 8	13,500	5,400	12	2	9,000	2,200	12	2
ø 10	10,800	5,200	15	2.5	7,200	2,100	15	2.5
ø 12	8,775	4,800	18	3	5,900	1,900	18	3
ø 16	6,750	4,600	24	4	4,500	1,800	24	4
ø 20	5,400	4,300	30	5	3,600	1,700	30	5
절입량 Depth of Cut								

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전 속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 피삭재와 가공 모양에 따라 적절한 쿨런트를 사용 하십시오.

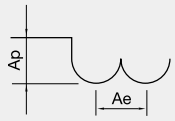
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- In case of long effective length, reduce the RPM and feed by 20% or less.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Depending on the workpiece and shape, use adequate coolant.

3TBIC Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material			합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61			
경도 Hardness			40 ~ 45HRc				45 ~ 55HRc				55~ 62HRc			
반경 Radius	유효장 Effective Length	각도 Taper Angle	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	12	1°	38,000	1,375	0.110	0.16	35,000	880	0.080	0.13	25,000	440	0.050	0.08
〃	20	1°	38,000	1,375	0.060	0.09	35,000	880	0.050	0.07	25,000	440	0.030	0.05
〃	15	2°	38,000	1,375	0.090	0.14	35,000	880	0.070	0.11	25,000	440	0.050	0.07
〃	20	2°	38,000	1,375	0.060	0.09	35,000	880	0.050	0.07	25,000	440	0.030	0.05
〃	15	3°	38,000	1,375	0.090	0.14	35,000	880	0.070	0.11	25,000	440	0.050	0.07
〃	20	3°	38,000	1,375	0.060	0.09	35,000	880	0.050	0.07	25,000	440	0.030	0.05
〃	20	4°	38,000	1,375	0.070	0.1	35,000	880	0.060	0.08	25,000	440	0.030	0.05
〃	20	5°	38,000	1,375	0.080	0.11	35,000	880	0.060	0.09	25,000	440	0.040	0.06
〃	20	7°	38,000	1,375	0.080	0.11	35,000	880	0.060	0.09	25,000	440	0.040	0.06
R 1	12	1°	35,000	1,540	0.400	0.27	30,000	990	0.140	0.22	15,000	550	0.090	0.14
〃	20	1°	35,000	1,540	0.180	0.21	30,000	990	0.110	0.17	15,000	550	0.070	0.11
〃	15	2°	35,000	1,540	0.400	0.24	30,000	990	0.130	0.19	15,000	550	0.080	0.12
〃	20	2°	35,000	1,540	0.160	0.21	30,000	990	0.110	0.17	15,000	550	0.070	0.11
〃	15	3°	35,000	1,540	0.400	0.24	30,000	990	0.130	0.19	15,000	550	0.080	0.12
〃	20	3°	35,000	1,540	0.300	0.21	30,000	990	0.110	0.17	15,000	550	0.070	0.11
〃	30	3°	35,000	1,540	0.160	0.2	30,000	990	0.12	0.18	15,000	550	0.08	0.12
〃	20	4°	35,000	1,540	0.400	0.21	30,000	990	0.110	0.17	15,000	550	0.070	0.11
〃	20	5°	35,000	1,540	0.15	0.22	30,000	990	0.12	0.18	15,000	550	0.08	0.12
〃	30	5°	35,000	1,540	0.13	0.2	30,000	990	0.11	0.18	15,000	550	0.07	0.12
〃	29	6°	35,000	1,540	0.14	0.2	30,000	990	0.1	0.18	15,000	550	0.07	0.12
〃	25	7°	35,000	1,540	0.15	0.25	30,000	990	0.12	0.18	15,000	550	0.07	0.11
R 2	20	1°	24,000	1,925	0.23	0.34	20,000	1,375	0.18	0.27	12,000	825	0.11	0.17
〃	20	2°	24,000	1,925	0.23	0.34	20,000	1,375	0.18	0.27	12,000	825	0.11	0.17
〃	21	3°	24,000	1,925	0.23	0.34	20,000	1,375	0.18	0.27	12,000	825	0.11	0.17
〃	20	4°	24,000	1,925	0.23	0.34	20,000	1,375	0.18	0.27	12,000	825	0.11	0.17
〃	20	5°	24,000	1,925	0.24	0.37	20,000	1,375	0.19	0.29	12,000	825	0.12	0.18
〃	20	6°	24,000	1,925	0.22	0.32	20,000	1,375	0.17	0.25	12,000	825	0.1	0.16
〃	18	7°	24,000	1,925	0.23	0.34	20,000	1,375	0.18	0.27	12,000	825	0.11	0.17
R 3	32	1°	16,000	1,925	0.23	0.41	13,500	1,375	0.23	0.35	8,000	825	0.14	0.21
〃	30	2°	16,000	1,925	0.25	0.42	13,500	1,375	0.23	0.35	8,000	825	0.14	0.21
〃	22	3°	16,000	1,925	0.3	0.45	13,500	1,375	0.24	0.36	8,000	825	0.15	0.23
〃	40	3°	16,000	1,925	0.2	0.4	13,500	1,375	0.2	0.35	8,000	825	0.13	0.19
〃	25	4°	16,000	1,925	0.22	0.43	13,500	1,375	0.22	0.36	8,000	825	0.14	0.2
〃	21	5°	16,000	1,925	0.25	0.45	13,500	1,375	0.23	0.36	8,000	825	0.14	0.23
〃	21	6°	16,000	1,925	0.25	0.45	13,500	1,375	0.23	0.36	8,000	825	0.14	0.23
〃	19	7°	16,000	1,925	0.21	0.43	13,500	1,375	0.25	0.36	8,000	825	0.15	0.25

절입량 Depth of Cut



Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- 절삭 조건에 없는 각도는 같은 직경에 이전 각도와 비례하여 사용 하십시오.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 절삭 양이 작은 경우, Feed를 최대 20% 까지 UP 시켜 주십시오.
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- If there is no parameter for the angle of your tool, refer to the previous angle, and adjust compare to it.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If you want to increase metal removal rates, raise up the feed up to 20%.
- During the chip evacuation, note for heat and ignition.

4&6CTDB

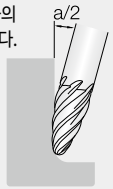
■ 6CTDB는 RPM 동일, FEED만 최대 **30% Up** 적용.
■ Use the same RPM and raise up the feed up to 30% for 6CTDB.

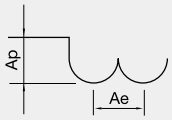
• RPM : rev./min • Feed : mm/min

피삭재 Material		흑연 Graphite				공구강 / 금형강 Tool steels / Mold steels SCM / HPM			
경도 Hardness						30 ~ 40HRc			
반경 Radius	a/2	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.5	10	35,000	4,200	0.22	0.3	42,000	1,950	0.09	0.05
R 0.75	10	33,000	5,250	0.27	0.3	39,000	2,860	0.10	0.05
R 1	10	32,000	6,300	0.32	0.6	38,500	3,510	0.20	0.10
R 1	15	25,000	6,000	1.18	0.6	30,000	2,730	0.20	0.10
R 1.5	10	25,000	6,000	0.39	0.8	30,000	3,120	0.30	0.10
R 2	10	16,000	4,500	0.45	1.1	20,000	2,275	0.40	0.10
R 2	30	14,500	3,700	1.18	1.1	18,000	1,950	0.40	0.10
R 3	10	12,000	4,250	0.49	1.4	14,000	2,210	0.60	0.10
R 3	20	10,500	4,000	1.18	1.4	13,200	2,015	0.60	0.10
R 4	5	9,500	4,100	0.45	1.6	11,000	2,080	0.80	0.10
R 4	10	8,000	3,850	0.45	1.6	10,000	1,950	0.80	0.10

절입량 Depth of Cut

a/2 각도만큼의 절삭을권장합니다.





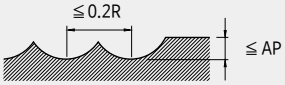
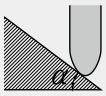
Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- 절삭 조건표는 4날 기준이며, 6날시에는 회전수는 유지하고, 피드는 안정적인 속도 내에서 최대30%까지 UP 해주십시오.
- 절삭 조건에 없는 각도는 같은 직경에 이전 각도와 비례하여 사용 하십시오.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 5축 가공시 유효장 부분을 확인 하여 주십시오.
- 절삭양이 작은 경우, Feed를 최대 20% 까지 UP 시켜 주십시오.
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- The parameters on the table is based on 4 flutes. For using 6 flutes, use the same RPM and raise up the feed up to 30% in stable milling condition.
- If there is no parameter for the angle of your tool, refer to the previous angle, and adjust compare to it.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- For 5-axis milling, check the length of the effective length before milling.
- If you want to increase metal removal rates, raise up the feed up to 20%.
- During the chip evacuation, note for heat and ignition.

2CTB Cutting Condition

• RPM : rev./min • Feed : mm/min

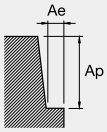
피삭재 Material	합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M						고경도강 Hardened Steels STAVAX / SKD11					
경도 Hardness	40 ~ 45HRC						45~ 55HRC					
반경 Radius	α≦15°		α>15°		Ap Axial Depth	Ae Radial Depth	α≦15°		α>15°		Ap Axial Depth	Ae Radial Depth
	RPM	FEED	RPM	FEED			RPM	FEED	RPM	FEED		
R0.5	40,000	2,800	40,000	1,600	0.06	0.1	40,000	2,800	40,000	1,500	0.05	0.1
R0.75	40,000	3,250	40,000	2,000	0.09	0.15	40,000	3,250	32,000	1,600	0.08	0.15
R1	40,000	3,250	39,000	2,350	0.11	0.2	40,000	3,250	31,000	1,750	0.11	0.2
R1.25	40,000	3,500	30,000	2,250	0.12	0.25	36,000	3,250	26,000	1,750	0.12	0.25
R1.5	40,000	3,750	27,000	2,150	0.13	0.3	32,000	3,000	22,000	1,700	0.13	0.3
R2	32,000	3,750	20,000	1,800	0.15	0.4	25,000	3,000	16,000	1,350	0.15	0.4
R2.5	25,000	3,000	16,000	1,450	0.2	0.5	20,000	2,700	13,000	1,150	0.2	0.5
R3	21,000	2,900	13,000	1,300	0.25	0.6	17,000	2,350	10,000	1,000	0.25	0.6
R4	16,000	2,250	10,000	1,000	0.3	0.8	13,000	1,800	8,000	750	0.3	0.8
R5	13,000	1,800	8,000	850	0.5	1	10,000	1,450	6,400	600	0.5	1
R6	9,000	1,250	6,000	650	0.5	1.2	7,200	1,000	4,800	500	0.5	1.2
절입량 Depth of Cut												

- α 란 가공면의 경사각입니다.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정하십시오.
- 에어브로 혹은 미스트 쿨런트를 추천합니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 칩 제거 주의 및 가공시 발열, 발화에 주의 하십시오.

- α value represents the inclined angle.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Air blow or mist coolant is recommended.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- During the chip evacuation, note for heat and ignition.

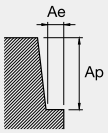
2CTE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steels HP / SM		구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC		공구강 / 금형강 Tool steels / Mold steels SCM / HPM		합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304/ SUS316		고경도강 Hardened Steels STAVAX / SKD11	
경도 Hardness	~200HB		~ 30HRc		30 ~ 40HRc		38 ~ 45HRc		45 ~ 55HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø 1	15,500	155	15,500	130	13,000	90	12,000	90	10,500	40
ø 1.5	10,500	155	10,500	130	8,900	90	8,250	90	7,000	40
ø 2	7,950	155	7,950	130	6,650	90	6,200	90	5,250	40
ø 2.5	6,200	145	6,200	125	5,300	90	4,950	90	4,200	40
ø 3	5,150	145	5,150	125	4,450	90	4,100	90	3,500	40
ø 4	3,850	145	3,850	125	3,300	90	3,100	85	2,600	40
ø 5	3,100	145	3,100	125	2,650	90	2,450	85	2,100	40
ø 6	2,600	145	2,600	125	2,200	90	2,050	85	1,750	40
ø 8	1,950	145	1,950	125	1,650	90	1,550	85	1,300	40
ø 10	1,550	145	1,550	120	1,300	90	1,200	85	1,050	40
절입량 Depth of Cut	Ap | Ae 2.5D | 0.02D									

4CTE

• RPM : rev./min • Feed : mm/min

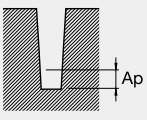
피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steels HP / SM		구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC		공구강 / 금형강 Tool steels / Mold steels SCM / HPM		합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304/ SUS316		고경도강 Hardened Steels STAVAX / SKD11	
경도 Hardness	~200HB		~ 30HRc		30 ~ 40HRc		38 ~ 45HRc		45 ~ 55HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
ø 3	5,300	225	4,450	225	4,450	180	4,100	130	3,500	130
ø 4	3,950	245	3,300	245	3,300	195	3,100	150	2,600	150
ø 5	3,150	275	2,650	275	2,650	225	2,450	160	2,100	160
ø 6	2,200	275	2,200	275	2,200	225	2,050	175	1,750	175
ø 8	1,950	270	1,650	270	1,650	225	1,550	190	1,300	190
ø 10	1,550	270	1,300	270	1,300	225	1,200	180	1,050	180
절입량 Depth of Cut	Ap 2.5D, Ae 0.02D 									

- 절입기준은 2CTE, 4CTE 동일 합니다.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 가급적 열박음 척을 사용하여 주십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- 2CTE and 4CTE type can be used the same depth of cut.
- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Using shrink-fit chuck is recommeded.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4RTE Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC			공구강 / 금형강 Tool steels / Mold steels SCM / HPM			합금강 / 프리하든강 / 스테인레스강 Alloy Steels / Pre-hardened Steels / Stainless Steels NAK80 / KP4M / SUS304/ SUS316			고경도강 Hardened Steels STAVAX / SKD11		
경도 Hardness	~ 30HRc			30HRc ~ 40HRc			38HRc ~ 45HRc			45HRc ~ 55HRc		
외경 Outside Diameter	RPM	FEED	Ap	RPM	FEED	Ap	RPM	FEED	Ap	RPM	FEED	Ap
ø 0.5	31,500	565	0.01~0.025	31,500	475	0.01~0.025	31,500	440	0.01~0.025	19,000	250	0.005~0.01
ø 0.6	31,500	680	0.012~0.03	29,500	530	0.012~0.03	26,500	445	0.012~0.03	15,500	260	0.006~0.012
ø 0.7	27,000	680	0.014~0.035	25,000	530	0.014~0.035	22,500	445	0.014~0.035	13,500	260	0.007~0.014
ø 0.8	23,500	680	0.016~0.04	22,000	630	0.016~0.04	19,500	445	0.016~0.04	11,500	260	0.008~0.016
ø 0.9	21,000	680	0.018~0.045	19,500	530	0.018~0.045	17,500	445	0.018~0.045	10,500	260	0.009~0.018
ø 1	19,000	680	0.02~0.05	17,500	530	0.02~0.05	15,500	445	0.02~0.05	9,500	260	0.01~0.02
ø 1.2	15,500	680	0.024~0.06	14,500	530	0.024~0.06	13,000	445	0.024~0.06	7,950	260	0.012~0.024
ø 1.5	12,500	680	0.03~0.075	11,500	530	0.03~0.075	10,500	445	0.03~0.075	6,350	260	0.015~0.03
ø 2	9,500	680	0.04~0.1	8,900	530	0.04~0.1	7,950	445	0.04~0.1	4,750	260	0.02~0.04
ø 2.5	7,600	680	0.05~0.125	7,100	530	0.05~0.125	7,950	445	0.04~0.1	4,750	260	0.02~0.04
절입량 Depth of Cut												

- 날 깊이를 얻기 위해서는, 순차적으로 하나씩 목부길이를 맞추는 것이 가장 효과적 입니다.
- 이송속도 및 축 방향의 절입 깊이는 테이퍼각에 따라 고려하시고, 절삭 상황에 맞추어 조정 하십시오.
- 코너 작업시에는 피드값을 50% 줄여 주십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- Consider the RPM and feed based on the taper angle and adjust it with milling condition.
- Reduce the feed by 50% for corner milling.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

2CRC Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild steels / Free cutting steel HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM	
경도 Hardness	~200HB		~30HRc		30~ 40HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø 1.9	7,400	410	8,500	340	10,000	270
ø 2.9	6,600	365	7,800	300	9,230	240
ø 3.9	5,800	320	7,300	270	8,500	210
ø 4.9	5,250	300	6,500	240	7,560	190
ø 5.9	4,600	260	5,700	220	6,750	170

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- R 게이지를 통해 절삭 후 측정 바랍니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Measure after cutting through the R gauge.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.

4CRC

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild steels / Free cutting steel HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM	
경도 Hardness	~200HB		~30HRc		30~ 40HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø 1.9	5,940	630	6,800	520	8,000	420
ø 2.9	5,280	560	6,000	470	7,100	370
ø 3.9	4,700	500	5,400	420	6,300	330
ø 4.9	4,200	450	4,830	370	5,600	300
ø 5.9	3,700	410	4,250	330	5,000	270

- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- R 게이지를 통해 절삭 후 측정 바랍니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Measure after cutting through the R gauge.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.

1HTE

• RPM : rev./min • Feed : mm/min

피삭재 Material	알루미늄 합금 Aluminum AL7075		플라스틱 Plastic		ABS수지 / 아크릴 ABS resin Acrylic	
경도 Hardness						
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø1.2	21,300	470	12,000	300	30,000	2,000
ø2	15,500	600	7,000	300	30,000	2,200
ø3	13,580	660	4,800	250	25,000	2,400
ø4	10,160	690	3,600	200	20,000	2,200
ø5	8,170	700	2,400	120	13,500	2,300
ø8	5,130	640	2,050	120	10,000	2,400
ø10	4,085	600	1,600	120	8,000	2,400
ø12	3,420	560	1,350	120	7,000	2,200
ø16	3,040	550	950	120	5,600	2,200

- 절삭날의 칩 융착을 주의하십시오.
- 피삭재에 진입 시 공구의 칩 뭉침을 확인해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례 적으로 조정하십시오.

- Please be mindful of chip adhesion on the cutting edge.
- When entering the cutting material, please check for chip buildup on the tool.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.

1CHA

• RPM : rev./min • Feed : mm/min

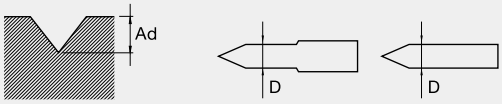
피삭재 Material	알루미늄 합금 Aluminum AL7075		플라스틱 Plastic		ABS수지 / 아크릴 ABS resin Acrylic	
경도 Hardness						
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø0.9	37,000	230	14,500	300	25,000	220
ø1.2	34,000	230	11,000	320	24,000	230
ø2	20,700	230	8,500	350	12,000	230
ø3	13,800	230	6,800	380	8,000	230
ø4	10,350	250	6,200	380	6,000	230
ø6	6,900	250	5,900	400	4,000	240
ø8	5,150	250	5,000	400	3,000	240
ø10	4,140	250	4,000	400	3,000	250
ø12	3,450	250	3,300	420	2,000	250
ø16	2,588	250	2,500	420	1,400	250

- 가공 진입 시 가능한 피삭재 밖에서 진입 하십시오.
- 상기 절삭 조건의 참고는 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 에어브로 혹은 수용성 절삭유 또는 유성 절삭유를 추천합니다.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

1STE/2STE/4STE

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild steels / Free cutting steel HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM	
경도 Hardness	~200HB		~30HRc		30~ 40HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø 2	5,500	85	4,000	75	3,000	50
ø 3	4,000	70	3,000	55	2,000	40
ø 4	3,000	60	2,500	45	1,800	35
ø 5	2,500	50	2,000	40	1,500	30
ø 6	2,000	45	1,600	35	1,200	25
ø 7	1,800	40	1,300	30	1,150	25
ø 8	1,500	35	1,250	30	900	23
ø 9	1,350	35	1,100	30	850	20
ø 10	1,200	35	900	25	800	20
ø 11	1,100	35	850	25	750	20
ø 12	1,000	30	800	25	600	15
절입량 Depth of Cut	Ad : 0.05D이하 					

- 상기 조건은 2날 기준이며 날수의 변경시 같은 직경에 비례하여 회전수와 이송속도를 UP/DOWN 시켜주십시오.
- 조각 가공시 엔드밀의 날 끝을 확인해 주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.

- The parameters on the table is based on 2 flutes. To change the number of flutes, refer to the same diameter of other parameters and then adjust it.
- For engrave machining, check the edge of the flutes.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.

2CHA/3CHA Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild steels / Free cutting steel HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM	
경도 Hardness	~200HB		~30HRc		30~ 40HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø 3	4,200	70	3,000	55	2,500	40
ø 4	3,000	60	2,500	45	1,800	35
ø 6	2,000	40	1,500	35	1,200	25
ø 8	1,500	35	1,200	30	900	25
ø 10	1,200	35	1,000	25	900	20
ø 12	1,000	30	850	25	600	20
절입량 Depth of Cut	Ap : 0.1d Ap : Axial Depth 축방향의절입깊이(mm) 					

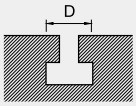
- 상기 조건은 2날 기준이며 날 수의 변경시 같은 직경에 비례하여 회전수와 이송속도를 UP/DOWN 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 에어브로 혹은 수용성 절삭유 또는 유성 절삭유를 추천합니다.

- The parameters on the table is based on 2 flutes. To change the number of flutes, refer to the same diameter of other parameters and then adjust it.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Air blow, water-soluble oil, or oil mist is recommended.

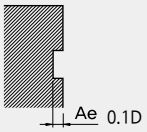
4TES/4TRS/3TRC/4&6TDA/3&4THC/4&6TAC

■ 3TRC는RPM 동일, FEED만최대 30% Down 적용.
■ Use the same RPM and reduce the feed by 30% for 3TRC.

홈절삭 Slotting

피삭재 Material	일반구조강/쾌삭강 Mild steels / Free cutting steel HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM	
경도 Hardness	~200HB		~30HRc		30~ 40HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø 1.5	3,050	117	1,890	77	1,530	59
ø 2	2,850	110	1,790	72	1,440	55
ø 2.5	2,680	99	1,700	66	1,350	50
ø 3	2,500	92	1,610	60	1,260	45
ø 4	2,150	81	1,430	54	1,080	41
ø 5	1,800	70	1,200	47	900	35
ø 6	1,430	59	950	39	720	30
ø 8	1,070	44	720	30	540	22
ø 10	860	35	580	23	430	17
ø 12	720	30	480	20	360	14
절입량 Depth of Cut						

측면절삭 Side Cutting

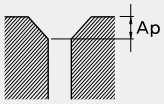
피삭재 Material	일반구조강/쾌삭강 Mild steels / Free cutting steel HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM	
경도 Hardness	~200HB		~30HRc		30~ 40HRc	
외경 Outside Diameter	RPM	FEED	RPM	FEED	RPM	FEED
ø 1.5	3,050	162	1,890	94	1,530	76
ø 2	2,850	149	1,790	88	1,440	70
ø 2.5	2,680	135	1,700	83	1,350	65
ø 3	2,500	122	1,610	79	1,260	59
ø 4	2,150	108	1,430	72	1,080	54
ø 5	1,800	95	1,200	65	900	49
ø 6	1,430	86	950	58	720	43
ø 8	1,070	64	720	43	540	32
ø 10	860	52	580	34	430	26
ø 12	720	43	480	29	360	22
절입량 Depth of Cut						

- 공구 진입시 피삭재 밖에서 진입하십시오. • 상기 절삭 조건은 4날 기준이며, 3TRC의 경우 회전수는 유지하고 Feed를 30% 줄여서 사용하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 측면절삭 시 떨림이 발생한 경우 절삭조건의 Feed를 줄여주십시오.

- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- The parameters on the table is based on 4 flutes. For using 3TRC , use the same RPM and reduce the feed by 30%.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- If a vibration is occurred while side milling, reduce the feed.

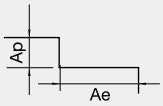
2CEN Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM			구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC			공구강 / 금형강 Tool steels / Mold steels SCM / HPM			알루미늄 합금 Aluminum Alloys AL7075		
경도 Hardness	-200HB			~30HRc			30~ 40HRc					
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth	RPM	FEED	Ap Axial Depth
ø 2	1,400	100	2	800	50	2	650	40	1	4,800	280	2
ø 3	1,400	100	3	800	50	3	650	40	1.5	4,800	280	3
ø 4	1,280	100	4	690	50	4	580	40	2	4,200	280	4
ø 5	1,300	100	5	640	50	5	520	40	2.5	3,300	280	5
ø 6	1,150	100	6	600	50	6	480	40	3	2,900	280	6
ø 8	1,000	100	8	530	50	8	420	40	4	2,600	280	8
ø 10	850	90	10	490	40	10	390	30	5	2,400	260	10
ø 12	720	90	12	410	40	12	310	30	6	1,900	260	12
ø 14	610	90	14	340	40	14	270	30	7	1,700	240	14
ø 16	550	90	16	310	40	16	250	30	8	1,500	230	16
절입량 Depth of Cut												

2CENE / 2CCMC

• RPM : rev./min • Feed : mm/min

피삭재 Materia	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC				공구강 / 금형강 Tool steels / Mold steels SCM / HPM				동 합금 Copper alloys C1100				알루미늄 Aluminum AL7075			
경도 Hardness	-200HB				~30HRc				30~ 40HRc											
외경 Outside Diameter	RPM	FEED	Ap	Ae	RPM	FEED	Ap	Ae	RPM	FEED	Ap	Ae	RPM	FEED	Ap	Ae	RPM	FEED	Ap	Ae
ø 1	28,000	230	1.5	0.05	24,500	180	1.5	0.05	17,500	120	1.5	0.05	23,000	150	1.5	0.1	50,000	400	1.5	0.2
ø 1.5	18,700	340	2.0	0.10	16,300	180	2.0	0.10	11,700	120	2.0	0.10	13,000	150	2.0	0.3	40,900	400	2.0	0.3
ø 2	14,000	360	2.5	0.15	12,300	220	2.5	0.15	8,800	170	2.5	0.15	11,500	150	2.5	0.4	31,800	400	2.5	0.4
ø 3	9,300	390	4.0	0.30	8,200	240	4.0	0.30	5,800	170	4.0	0.30	8,000	200	4.0	0.6	21,200	400	4.0	0.6
ø 4	7,000	390	5.0	0.40	6,100	240	5.0	0.40	4,400	180	5.0	0.40	6,000	200	5.0	0.8	15,900	500	5.0	0.8
ø 5	5,600	470	6.0	0.50	4,900	260	6.0	0.50	3,500	200	6.0	0.50	5,000	200	6.0	1	12,700	500	6.0	1
ø 6	4,700	480	8.0	0.60	4,100	270	8.0	0.60	2,900	200	8.0	0.60	4,000	200	8.0	1.2	10,600	500	8.0	1.2
ø 8	3,500	470	10.0	1.00	3,100	270	10.0	1.00	2,200	200	10.0	1.00	3,000	200	10.0	1.6	8,000	600	10.0	1.6
ø 10	2,800	480	12.0	1.20	2,500	280	12.0	1.20	1,800	200	12.0	1.20	2,400	200	12.0	2	6,400	600	12.0	2
ø 12	2,300	470	15.0	1.50	2,000	260	15.0	1.50	1,500	200	15.0	1.50	2,000	200	15.0	2.4	5,300	700	15.0	2.4
절입량 Depth of Cut	Side Milling • Ap : Axial Depth • Ae : Radial Depth 																			

- 2CENE는 홈 절삭이 불가능하며, 2CCMC는 홈 절삭을 추천하지 않습니다.
- 상기 절삭 조건은 측면 절삭조건 입니다.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 에어브로 혹은 수용성 절삭유 또는 유성 절삭유를 추천합니다.

- Grooving with 2CENE is not possible and 2CCMC is also not recommeded.
- Above parameters are for side milling.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- If a vibration is occurred while side milling, reduce the feed.

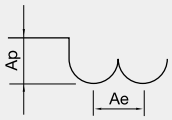
2MRB/3MRB

■ 3MRB는 RPM과 FEED를 10% Up 적용.
■ raise up the RPM and feed by 10% for 3MRB.

• RPM : rev./min • Feed : mm/min

피삭재 Material		알루미늄합금 Aluminum Alloys AL7075				플라스틱 Plastic			
반경 Corner Radius	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ap Radial Depth	RPM	FEED	Ap Axial Depth	Ap Radial Depth
R 0.1	1	35,000	420	0.003	0.03	35,000	1,000	0.05	0.03
R 0.15	2	35,000	490	0.004	0.04	35,000	1,050	0.06	0.04
R 0.2	3	35,000	560	0.005	0.06	35,000	1,100	0.07	0.06
R 0.25	4	35,000	700	0.006	0.07	28,000	1,200	0.08	0.07
〃	10	27,300	504	0.004	0.05	21,840	864	0.06	0.04
R 0.3	4	35,000	910	0.007	0.09	24,000	1,200	0.1	0.09
〃	10	27,300	655	0.005	0.07	18,720	864	0.07	0.05
R 0.4	4	26,000	940	0.008	0.12	18,000	900	0.13	0.12
〃	10	19,500	658	0.006	0.1	13,500	576	0.11	0.1
R 0.5	6	21,000	970	0.008	0.15	14,000	700	0.17	0.15
〃	16	14,700	631	0.006	0.1	9,800	455	0.1	0.09
R 0.6	6	18,000	1,010	0.009	0.18	12,000	600	0.2	0.18
〃	16	12,780	616	0.007	0.11	8,520	366	0.13	0.12
R 0.7	6	15,000	1,020	0.01	0.21	10,000	500	0.23	0.21
〃	16	10,800	622	0.008	0.16	7,200	305	0.17	0.15
R 0.75	6	14,000	1,010	0.012	0.24	9,500	480	0.25	0.24
〃	16	10,220	636	0.01	0.19	6,935	302	0.19	0.17
〃	25	8,483	477	0.008	0.14	5,756	227	0.13	0.11
R 1	8	11,000	1,100	0.18	0.35	7,000	350	0.4	0.35
〃	20	8,140	704	0.16	0.3	5,180	224	0.35	0.33
〃	30	6,919	528	0.14	0.25	4,403	168	0.3	0.28
R 1.5	8	6,900	760	0.2	0.5	4,800	240	0.5	0.5
〃	20	5,313	486	0.18	0.45	4,080	151	0.45	0.45
〃	30	4,516	365	0.16	0.4	3,142	113	0.4	0.4
R 2	16	5,200	690	0.25	0.65	3,600	180	0.6	0.65
〃	25	4,056	449	0.22	0.6	3,060	113	0.56	0.61
〃	35	3,488	336	0.2	0.55	2,356	85	0.54	0.57
R 2.5	16	4,200	590	0.3	0.8	2,900	150	0.8	0.85
〃	25	3,234	401	0.27	0.75	2,233	102	0.76	0.81
〃	35	2,652	309	0.24	0.7	1,831	79	0.72	0.75
R 3	25	3,500	550	0.35	0.9	2,400	120	1	1.2
〃	35	2,940	468	0.33	0.8	2,016	102	0.95	1.1
〃	50	2,323	355	0.3	0.7	1,593	78	0.9	1
R 4	-	3,300	520	0.4	1.2	2,065	130	1.3	1.6
R 5	-	2,850	500	0.5	1.5	1,615	125	1.6	2
R 6	-	2,650	470	0.6	1.8	1,350	125	2	2.4
R 7	-	2,500	450	0.8	2.4	1,000	120	2.5	3.2

절입량
Depth of Cut



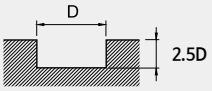
Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- 상기 절삭조건은 2날 기준이며, 3날 가공시 회전수와 Feed를 10% UP 시켜주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용 합니다.

- The parameters on the table is based on 2 flutes. For using 3 flutes, increase RPM and feed by 10% 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.

1MBE

• RPM : rev./min • Feed : mm/min

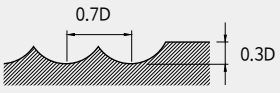
피삭재 Material	ABS 수지 / 아크릴 ABS resin / Acrylic			알루미늄합금 Aluminum Alloys AL7075		
외경 Outside Diameter	RPM	FEED	Ap (Axial Depth)	RPM	FEED	Ap (Axial Depth)
R0.5	41,600	2,200	2.5	29,900	1,430	2.5
R1	41,600	2,420	5	29,900	1,650	5
R1.5	32,500	2,640	7.5	23,400	1,870	7.5
R2	26,000	2,640	10	19,500	1,980	10
R2.5	19,500	2,420	12.5	15,600	1,980	12.5
R3	17,550	2,530	15	13,000	1,980	15
R4	17,000	2,640	20	12,500	2,090	20
R5	16,000	2,640	25	12,000	2,200	25
R6	14,000	2,420	30	10,000	2,090	30
R8	13,000	2,350	40	8,700	2,000	40
절입량 Depth of Cut						

- 절삭날의 칩 융착을 주의하십시오.
- 최대한 공구 진입 시 피삭재 밖에서 진입하십시오
- 상기 절살조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

- Please be mindful of chip adhesion on the cutting edge.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.

2MLB

• RPM : rev./min • Feed : mm/min

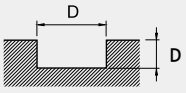
피삭재 Material	ABS 수지 / 아크릴 ABS resin / Acrylic			
반경 Radius	RPM	FEED	Ap Axial Depth	Ap Radial Depth
R 0.1	37,000	50	0.06	0.14
R 0.2	37,000	100	0.12	0.28
R 0.3	37,000	140	0.18	0.42
R 0.4	37,000	190	0.24	0.56
R 0.5	32,000	210	0.30	0.7
R 1	16,000	210	0.60	1.4
R 1.5	11,000	210	0.90	2.1
R 2	8,200	210	1.20	2.8
R 2.5	6,000	250	1.50	3.5
R 3	5,500	250	1.80	4.2
R 4	4,100	280	2.40	5.6
R 5	3,200	280	3.00	7.0
R 6	2,700	330	3.60	8.4
R 8	2,200	330	4.80	11.2
절입량 Depth of Cut				

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 상기 절사조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- 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.

2MLE

• RPM : rev./min • Feed : mm/min

피삭재 Material	ABS 수지 / 아크릴 ABS resin / Acrylic			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ap Radial Depth
ø 0.2	50,000	100	0.2	0.2
ø 0.4	50,000	200	0.4	0.4
ø 0.5	50,000	240	0.5	0.5
ø 0.6	40,000	240	0.6	0.6
ø 0.8	30,000	240	0.8	0.8
ø 1	24,000	240	1	1
ø 2	12,000	240	2	2
ø 3	8,000	240	3	3
ø 4	6,000	240	4	4
ø 5	4,800	240	5	5
ø 6	4,000	260	6	6
ø 8	3,000	260	8	8
ø 10	3,000	260	10	10
ø 12	2,000	260	12	12
ø 16	1,400	260	16	16
절입량 Depth of Cut				

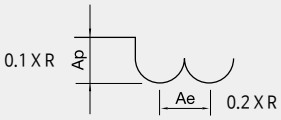
- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정하십시오.
- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 상기 절사조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전 속도가 부족한 경우에는 회전 속도와 이송속도를 같은 비율로 줄여서 적용합니다.

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- If the effective length is long, reduce the RPM and feed in the same proportion.
- 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.

2MBE / 3MBE

■ 3MBE는 RPM과FEED를 **10% Up** 적용.
■ Raise up the RPM and feed by 10% for 3MBE.

• RPM : rev./min • Feed : mm/min

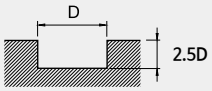
피삭재 Material	일반구조강/쾌삭강 Mild steels / Free cutting steel HP/SM				구조용강/탄소강/회주철 Structural steel / Carbon Steels /Gray cast iron SS/SC/FC				공구강/금형강 Tool steels / Mold steels SCM/HPM			
경도 Hardness	~200HB				~30HRc				30~ 40HRc			
반경 Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 0.2	36,000	630	0.02	0.04	34,200	520	0.02	0.04	33,174	400	0.02	0.04
R 0.3	24,300	630	0.03	0.06	23,085	520	0.03	0.06	22,392	400	0.03	0.06
R 0.4	21,000	630	0.04	0.08	19,950	520	0.04	0.08	19,352	400	0.04	0.08
R 0.5	12,000	630	0.05	0.10	12,300	520	0.1	0.10	10,179	400	0.05	0.10
R 1	11,400	630	0.10	0.20	10,000	520	0.1	0.20	8,700	400	0.10	0.20
R 1.5	7,700	630	0.15	0.30	6,700	520	0.2	0.30	5,800	400	0.15	0.30
R 2	5,800	630	0.20	0.40	5,000	520	0.2	0.40	4,300	400	0.20	0.40
R 3	3,800	630	0.30	0.60	3,300	520	0.3	0.60	2,900	400	0.30	0.60
R 4	2,900	630	0.40	0.80	2,500	520	0.4	0.80	2,200	400	0.40	0.80
R 5	2,300	630	0.50	1.00	2,000	520	0.5	1.00	1,700	400	0.50	1.00
R 6	1,900	630	0.60	1.20	1,700	520	0.6	1.20	1,400	400	0.60	1.20
절입량 Depth of Cut												

- 상기 절삭 조건은 2날 기준이며 3날 가공시 회전수와 Feed를 10% UP 시켜주십시오.
- R0.5 이하 제품은 절삭조건의 Feed 보다낮게 시작하여 점차 올려 주십시오.
- 상기 절사조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 적용 기계의 회전속도가 부족한 경우에는 회전 속도와 이송 속도를 같은 비율로 줄여서 적용합니다.

- The parameters on the table is based on 2 flutes. For using 3 flutes, increase RPM and feed by 10% in stable milling condition.
- Below 0.5mm of front diameter tool, set up the lower RPM
- 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.

1MEM / 1REM

• RPM : rev./min • Feed : mm/min

피삭재 Material	ABS 수지 / 아크릴 ABS resin / Acrylic			구조용강/탄소강/회주철 Structural steel / Carbon Steels /Gray cast iron SS/SC/FC		
외경 Outside Diameter	RPM	FEED	Ap (Axial Depth)	RPM	FEED	Ap (Axial Depth)
ø 1	32,000	2,000	2.5	23,000	1,300	2.5
ø 2	32,000	2,200	5	23,000	1,500	5
ø 3	25,000	2,400	7.5	18,000	1,700	7.5
ø 4	20,000	2,400	10	15,000	1,800	10
ø 5	15,000	2,200	12.5	12,000	1,800	12.5
ø 6	13,500	2,300	15	10,000	1,800	15
ø 8	10,000	2,400	20	7,800	1,900	20
ø 10	8,000	2,400	25	6,000	2,000	25
ø 12	7,000	2,200	30	5,000	1,900	30
절입량 Depth of Cut						

- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오
- 공구 진입시 피삭재 밖에서 진입 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.

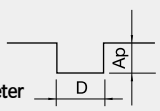
2MRE

• RPM : rev./min • Feed : mm/min

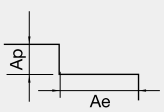
피삭재 Material		ABS / MC Nylon				Acrylic / Polyaetal				Polycabonate			
외경 Outside Diameter	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 0.5	2	7,800	150	0.20	0.005	19,500	150	0.20	0.005	11,700	150	0.20	0.005
〃	4	7,800	150	0.20	0.003	19,500	150	0.20	0.003	11,700	150	0.20	0.003
〃	6	7,800	150	0.20	0.001	19,500	150	0.20	0.001	11,700	150	0.20	0.001
ø 0.6	4	7,800	170	0.20	0.005	18,720	150	0.20	0.005	11,440	270	0.20	0.005
〃	6	7,800	170	0.20	0.003	18,720	150	0.20	0.003	11,440	270	0.20	0.003
ø 0.7	4	7,800	190	0.20	0.01	17,940	150	0.20	0.01	11,180	390	0.20	0.01
〃	6	7,800	190	0.20	0.008	17,940	150	0.20	0.008	11,180	390	0.20	0.008
ø 0.8	6	7,800	210	0.20	0.008	17,160	150	0.20	0.008	10,920	500	0.20	0.008
〃	8	7,800	210	0.20	0.005	16,770	140	0.20	0.005	10,660	480	0.20	0.005
ø 0.9	6	7,800	230	0.20	0.08	16,380	150	0.20	0.08	10,660	650	0.20	0.08
〃	10	7,800	230	0.20	0.03	15,340	130	0.20	0.03	10,140	500	0.20	0.03
ø 1	6	7,800	250	0.30	0.05	15,600	150	0.30	0.05	10,400	750	0.30	0.05
〃	8	7,800	250	0.30	0.05	14,950	135	0.30	0.05	10,010	700	0.30	0.05
〃	10	7,800	250	0.30	0.03	14,300	120	0.30	0.03	9,750	600	0.30	0.03
〃	12	7,800	250	0.30	0.03	13,520	110	0.30	0.03	9,360	550	0.30	0.03
〃	16	7,800	250	0.30	0.02	12,090	80	0.30	0.02	8,710	415	0.30	0.02
〃	20	7,800	250	0.30	0.01	10,400	45	0.30	0.01	7,800	250	0.30	0.01
ø 1.2	6	7,800	305	0.40	0.05	15,210	165	0.40	0.05	10,400	750	0.40	0.05
〃	8	7,800	305	0.40	0.05	14,560	150	0.40	0.05	10,010	700	0.40	0.05
〃	10	7,800	300	0.40	0.03	13,910	140	0.40	0.03	9,750	650	0.40	0.03
〃	12	7,800	300	0.40	0.03	13,260	125	0.40	0.03	9,360	600	0.40	0.03
ø 1.4	6	7,800	360	0.40	0.05	14,742	180	0.40	0.05	10,400	800	0.40	0.05
〃	10	7,800	350	0.40	0.03	13,910	155	0.40	0.03	10,010	700	0.40	0.03
〃	16	7,800	340	0.40	0.01	12,740	115	0.40	0.01	9,360	500	0.40	0.01
ø 1.5	6	7,930	390	0.50	0.05	14,560	190	0.50	0.05	10,400	800	0.50	0.05
〃	10	7,800	380	0.50	0.05	13,260	165	0.50	0.05	9,750	700	0.50	0.05
〃	14	7,800	365	0.50	0.03	12,480	135	0.50	0.03	9,100	550	0.50	0.03
〃	16	7,800	365	0.50	0.03	11,440	125	0.50	0.03	8,710	500	0.50	0.03
〃	20	7,670	350	0.50	0.02	9,880	90	0.50	0.02	7,930	375	0.50	0.02
ø 1.6	6	7,930	415	0.80	0.05	14,300	195	0.80	0.05	10,400	800	0.80	0.05
ø 2	8	7,930	500	1.00	0.10	13,130	220	1.00	0.10	10,270	850	1.00	0.10
〃	10	7,800	490	1.00	0.10	12,740	210	1.00	0.10	10,010	800	1.00	0.10
〃	12	7,800	485	1.00	0.08	12,350	200	1.00	0.08	9,750	800	1.00	0.08
〃	14	7,670	475	1.00	0.08	11,830	190	1.00	0.08	9,490	750	1.00	0.08
〃	16	7,670	465	1.00	0.05	11,440	180	1.00	0.05	9,230	700	1.00	0.05
〃	18	7,540	460	1.00	0.05	11,050	170	1.00	0.05	8,970	650	1.00	0.05
〃	20	7,410	445	1.00	0.03	10,400	150	1.00	0.03	8,450	600	1.00	0.03
〃	25	7,280	425	1.00	0.03	9,360	125	1.00	0.03	7,800	550	1.00	0.03
〃	30	7,020	400	1.00	0.02	8,060	95	1.00	0.02	7,020	425	1.00	0.02
ø 2.5	12	7,800	650	1.20	0.20	11,180	240	1.20	0.20	9,620	800	1.20	0.20
〃	20	7,410	550	1.00	0.10	8,840	175	1.00	0.10	8,060	650	1.00	0.10
ø 3	8	8,060	800	1.50	0.30	11,310	305	1.50	0.30	10,400	950	1.50	0.30
〃	12	7,800	750	1.50	0.25	10,400	280	1.50	0.25	9,750	900	1.50	0.25
〃	16	7,540	700	1.50	0.20	9,490	255	1.50	0.20	9,100	850	1.50	0.20
〃	20	7,280	650	1.50	0.20	8,320	220	1.50	0.20	8,190	900	1.50	0.20
〃	25	7.020	600	1.50	0.15	7,150	185	1.50	0.15	7,280	700	1.50	0.15
〃	30	6,760	550	1.50	0.10	5,850	145	1.50	0.10	6,240	600	1.50	0.10
〃	40	6,240	480	1.50	0.10	3,510	80	1.50	0.10	4,550	420	1.50	0.10
ø 4	12	6,500	700	2.00	0.35	9,100	260	2.00	0.35	7,540	750	2.00	0.35
〃	16	6,370	700	2.00	0.30	8,450	240	2.00	0.30	7,150	700	2.00	0.30
〃	18	6,240	700	2.00	0.30	8,190	235	2.00	0.30	7,020	700	2.00	0.30
〃	20	6,240	700	2.00	0.30	7,800	220	2.00	0.30	6,630	650	2.00	0.30
〃	25	6,110	650	2.00	0.25	7,280	205	2.00	0.25	6,670	650	2.00	0.25
〃	30	5,850	650	2.00	0.20	6,110	170	2.00	0.20	5,720	550	2.00	0.20
〃	35	5,590	650	2.00	0.20	5,460	150	2.00	0.20	5,330	550	2.00	0.20
〃	40	5,460	650	2.00	0.10	4,680	125	2.00	0.10	4,680	480	2.00	0.10
〃	50	5,070	600	2.00	0.10	3,120	80	2.00	0.10	3,770	390	2.00	0.10
ø 5	16	4,420	600	2.50	0.50	7,540	235	2.50	0.50	5,200	600	2.50	0.50
〃	35	4,160	550	2.50	0.30	5,070	130	2.50	0.30	3,770	455	2.50	0.30
ø 6	35	3,120	480	3.00	0.40	3,380	120	3.00	0.40	2,470	380	3.00	0.40
〃	50	2,860	445	3.00	0.30	2,470	85	3.00	0.30	2,210	335	3.00	0.30
〃	60	2,600	400	3.00	0.20	13,00	45	3.00	0.20	1,950	300	3.00	0.20

절입량
Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



Side Milling
- Ap : Axial Depth
- Ae : Radial Depth



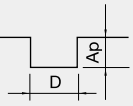
3MRE

• RPM : rev./min • Feed : mm/min

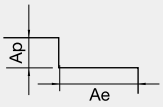
피삭재 Material		ABS / MC Nylon				Acrylic / Polyaetal				Polycabonate			
외경 Outside Diameter	유효장 Effective Length	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 1	10	8,268	280	0.30	0.03	14,056	132	0.30	0.03	10,725	784	0.30	0.03
〃	15	8,268	280	0.30	0.02	12,126	86	0.30	0.02	9,568	560	0.30	0.02
〃	20	8,268	280	0.30	0.01	10,473	52	0.30	0.01	8,775	420	0.30	0.01
ø 1.5	10	8,268	426	0.50	0.05	14,056	185	0.50	0.05	10,335	784	0.50	0.05
〃	15	8,268	409	0.50	0.03	12,126	140	0.50	0.03	9,233	560	0.50	0.03
〃	20	8,130	392	0.50	0.02	10,473	101	0.50	0.02	8,406	420	0.50	0.02
ø 2	10	8,229	550	1.00	0.10	13,441	236	1.00	0.10	10,561	898	1.00	0.10
〃	15	8,092	522	1.00	0.05	12,069	202	1.00	0.05	9,738	785	1.00	0.05
〃	20	7,818	499	1.00	0.03	10,972	168	1.00	0.03	8,915	673	1.00	0.03
〃	25	7,680	477	1.00	0.03	9,875	140	1.00	0.03	8,229	617	1.00	0.03
ø 3	20	7,622	733	1.50	0.20	8,711	248	1.50	0.20	8,575	1,015	1.50	0.20
〃	30	7,078	620	1.50	0.10	6,125	164	1.50	0.10	6,533	677	1.50	0.10
ø 4	20	6,533	790	2.00	0.30	8,167	248	2.00	0.30	6,942	733	2.00	0.30
〃	30	6,125	733	2.00	0.20	6,397	192	2.00	0.20	5,989	620	2.00	0.20
ø 6	30	4,141	612	3.00	0.40	4,486	153	3.00	0.40	3,279	484	3.00	0.40
〃	40	3,629	547	3.00	0.30	3,134	104	3.00	0.30	2,804	412	3.00	0.30
ø 8	40	3,338	514	4.00	0.50	2,883	98	4.00	0.50	2,580	387	4.00	0.50
〃	50	2,571	432	4.00	0.40	2,220	82	4.00	0.40	1,986	325	4.00	0.40
ø 10	50	2,262	401	5.00	0.60	1,954	77	5.00	0.60	1,748	302	5.00	0.60
〃	60	1,697	169	5.00	0.50	1,465	32	5.00	0.50	1,311	127	5.00	0.50
ø 12	60	1,442	153	6.00	0.60	1,245	29	6.00	0.60	1,114	116	6.00	0.60

절입량
Depth of Cut

Slotting
- **Ap : Axial Depth**
- **D : Outside Diameter**



Side Milling
- **Ap : Axial Depth**
- **Ae : Radial Depth**



- 날 끝이 정밀하게 연삭되어 있습니다. 파손을 피하기 위해 가능하면 비접촉 방식으로 측정 하십시오
- 가공 진입시 가능한 피삭재 밖에서 진입 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다 (Ø1 이하 사용시 진동 허용 관리 5㎛이내 일것.)

- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- 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, or found red heat on the material, 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㎛).

2MEM

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC				알루미늄 합금 Aluminum alloys AL7075			
경도 Hardness	-200HB				~30HRc							
외경 Outside Diameter	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 1	12,900	125	0.15	0.07	11,400	90	0.15	0.07	43,000	510	0.15	0.07
ø 1.5	8,600	125	0.75	0.11	7,700	90	0.75	0.11	29,000	580	0.75	0.11
ø 2	6,500	125	1.00	0.14	5,800	110	1.00	0.14	22,000	650	1.00	0.14
ø 2.5	5,100	150	1.25	0.18	4,600	110	1.25	0.18	17,200	680	1.25	0.18
ø 3	4,300	170	1.50	0.45	3,800	120	1.50	0.45	14,300	720	1.50	0.45
ø 4	3,200	200	3.00	0.60	2,900	120	3.00	0.60	10,700	750	3.00	0.60
ø 5	2,600	210	3.75	0.75	2,300	135	3.75	0.75	8,600	775	3.75	0.75
ø 6	2,200	220	4.50	0.90	1,900	150	4.50	0.90	7,200	790	4.50	0.90
ø 8	1,600	200	6.00	1.20	1,400	145	6.00	1.20	5,400	700	6.00	1.20
ø 10	1,300	180	7.50	1.50	1,200	145	7.50	1.50	4,300	650	7.50	1.50
ø 12	1,100	170	9.00	1.80	1,000	135	9.00	1.80	3,600	610	9.00	1.80

3MEM

• RPM : rev./min • Feed : mm/min

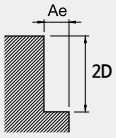
피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC				알루미늄 합금 Aluminum alloys AL7075			
경도 Hardness	-200HB				~30HRc							
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 1	13,674	141	0.15	0.07	12,084	101	0.15	0.07	45,580	566	0.15	0.07
ø 1.5	9,116	141	0.75	0.11	8,162	101	0.75	0.11	30,740	644	0.75	0.11
ø 2	6,890	141	1.00	0.14	6,148	123	1.00	0.14	23,320	722	1.00	0.14
ø 2.5	5,406	170	1.25	0.18	4,876	123	1.25	0.18	18,232	769	1.25	0.18
ø 3	4,558	192	1.50	0.45	4,028	134	1.50	0.45	15,158	799	1.50	0.45
ø 4	3,392	226	3.00	0.60	3,074	134	3.00	0.60	11,342	833	3.00	0.60
ø 6	2,332	249	4.50	0.90	2,014	168	4.50	0.90	7,632	877	4.50	0.90

4MEM

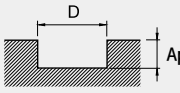
• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM				구조용강 / 탄소강 / 회주철 Structural steel / Carbon Steels /Gray cast iron SS / SC / FC				알루미늄 합금 Aluminum alloys AL7075			
경도 Hardness	-200HB				~30HRc							
외경 Outside Diameter	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 1	14,084	153	0.15	1.00	12,483	107	0.15	1.00	46,583	594	0.15	1.00
ø 1.5	9,389	153	0.75	1.50	8,431	107	0.75	1.50	31,416	676	0.75	1.50
ø 2	7,097	153	1.00	2.00	6,351	131	1.00	2.00	23,833	758	1.00	2.00
ø 2.5	5,568	183	1.25	2.50	5,037	131	1.25	2.50	18,633	808	1.25	2.50
ø 3	4,695	207	1.50	3.00	4,161	142	1.50	3.00	15,491	839	1.50	3.00
ø 4	3,494	244	3.00	4.00	3,175	142	3.00	4.00	11,592	874	3.00	4.00
ø 6	2,402	268	4.50	6.00	2,080	178	4.50	6.00	7,800	921	4.50	6.00
ø 8	2,509	258	6.00	8.00	1,957	156	6.00	8.00	6,006	889	6.00	8.00
ø 10	1,720	234	7.50	10.00	1,342	133	7.50	10.00	4,625	826	7.50	10.00
ø 12	1,279	210	9.00	12.00	998	116	9.00	12.00	3,561	744	9.00	12.00

절입량 Depth of Cut



Ae
ø 1 ~ 2.9 = 0.07D
ø 3 ~ = 0.15D



Ap
ø 1 ~ 1.2 = 0.15D
ø 1.5 ~ 3.5 = 0.5D
ø 4 ~ = 0.75D

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- 공구 진입시 피삭재 밖에서 진입 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.

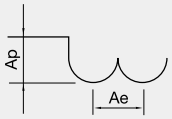
- The edge of the flute precisely grinded. If you want to measure the tool, and to avoid damaging on the flutes, use non-contact measuring method.
- When entering the tool to the workpiece, enter the tool from outside to the workpiece.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

2HHINB/2JJINB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM 30 ~40HRC				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M 40~45HRC				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
반경 Corner 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
R 5	7320	2635	0.25	1.0	6700	2196	0.50	1.0	5400	1910	0.50	0.50
R 5.5	6660	2428	0.28	1.1	6000	2024	0.55	1.1	4900	1760	0.55	0.55
R 6	6100	2185	0.30	1.2	5570	1821	0.60	1.2	4500	1584	0.60	0.60
R 6.5	5630	2015	0.33	1.3	5150	1679	0.65	1.3	4160	1461	0.65	0.65
R 8	4580	1639	0.40	1.6	4180	1366	0.80	1.6	3380	1188	0.80	0.80
R 8.5	4300	1542	0.43	1.7	3900	1285	0.85	1.7	3180	1118	0.85	0.85
R 10	3660	1311	0.50	2.0	3340	1093	1.00	2.0	2700	950	1.00	1.00
R 10.5	3500	1250	0.53	2.1	3180	1042	1.05	2.1	2580	906	1.05	1.05
R 12.5	2930	1056	0.63	2.5	2670	880	1.25	2.5	2170	765	1.25	1.25
R 13	2800	1007	0.65	2.6	2600	839	1.30	2.6	2080	730	1.30	1.30
R 15	2440	874	0.75	3.0	2230	728	1.50	3.0	1800	633	1.50	1.50

절입량 Depth of Cut



Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

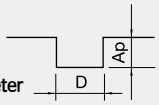
2HHINC/2JJINC Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM 30 ~40HRC				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M 40~45HRC				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 10	9550	950	0.25	2.0	8900	890	0.50	2.0	7000	700	0.50	1.0
ø 11	8690	870	0.28	2.2	8100	810	0.55	2.2	6370	640	0.55	1.1
ø 12	7960	800	0.30	2.4	7430	740	0.60	2.4	5840	580	0.60	1.2
ø 13	7350	730	0.33	2.6	6860	690	0.65	2.6	5390	540	0.65	1.3
ø 16	5970	600	0.40	3.2	5570	550	0.80	3.2	4380	440	0.80	1.6
ø 17	5620	560	0.43	3.4	5240	520	0.85	3.4	4120	410	0.85	1.7
ø 20	4780	480	0.50	4.0	4460	450	1.00	4.0	3500	350	1.00	2.0
ø 21	4550	450	0.53	4.2	4250	425	1.05	4.2	3340	330	1.05	2.1
ø 25	3800	380	0.63	5.0	3670	350	1.25	5.0	2800	280	1.25	2.5
ø 26	3670	360	0.65	5.2	3400	340	1.30	5.2	2700	270	1.30	2.6
ø 30	3200	320	0.75	6.0	2980	290	1.50	6.0	2330	230	1.50	3.0

절입량 Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

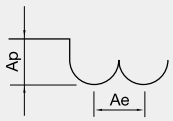
- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

2GINB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
반경 Corner 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
R 5	6,220	2,500	0.1	0.5	5,700	1,700	0.1	0.3	4,590	1,840	0.05	0.3
R 5.5	5,660	2,260	0.1	0.5	5,100	1,530	0.1	0.3	4,160	1,700	0.06	0.3
R 6	5,180	2,070	0.1	0.5	4,740	1,420	0.1	0.3	3,800	1,530	0.06	0.3
R 6.5	4,800	1,900	0.1	0.5	4,380	1,320	0.1	0.3	3,530	1,400	0.07	0.3
R 8	3,900	1,530	0.2	0.5	3,550	1,060	0.1	0.3	2,870	1,150	0.08	0.3
R 8.5	3,660	1,460	0.2	0.5	3,300	1,000	0.1	0.3	2,700	1,080	0.09	0.3
R 10	3,120	1,240	0.2	0.5	2,840	850	0.1	0.3	2,300	920	0.10	0.3
R 10.5	3,000	1,180	0.2	0.5	2,700	800	0.1	0.3	2,200	880	0.11	0.3
R 12.5	2,500	990	0.3	0.5	2,270	680	0.1	0.3	1,830	740	0.13	0.3
R 13	2,380	960	0.3	0.5	2,210	650	0.1	0.3	1,760	700	0.13	0.3
R 15	2,080	850	0.3	0.5	1,990	600	0.2	0.3	1,530	610	0.15	0.3

절입량 Depth of Cut



Ap : Axial Depth 축방향의절입깊이(mm)
Ae : Radial Depth 반경방향의절입깊이(mm)
D : Outside Diameter 외경(mm)
n : Speed 회전속도 (min^{-1})
Vf : Feed 이송속도 (mm/min)

- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

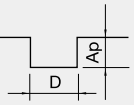
2GINC Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 10	8.200	807	0.3	2.0	7.560	756	0.1	1.0	5,950	595	0.125	1.0
ø 11	7.400	739	0.3	2.2	6.900	688	0.1	1.1	5,410	544	0.138	1.1
ø 12	6.770	680	0.3	2.4	6.320	629	0.2	1.2	4,960	493	0.150	1.2
ø 13	6.250	620	0.3	2.6	5.830	586	0.2	1.3	4,580	459	0.163	1.3
ø 16	5.070	510	0.4	3.2	4.740	467	0.2	1.6	3,720	374	0.200	1.6
ø 17	4.780	476	0.4	3.4	4.450	442	0.2	1.7	3,500	348	0.213	1.7
ø 20	4.060	408	0.5	4.0	3.790	382	0.3	2.0	2,970	297	0.250	2.0
ø 21	3.870	382	0.5	4.2	3.610	361	0.3	2.1	2,840	280	0.263	2.1
ø 25	3.230	323	0.6	5.0	3.120	287	0.3	2.5	2,380	238	0.313	2.5
ø 26	3.120	306	0.7	5.2	2.890	289	0.3	2.6	2,300	229	0.325	2.6
ø 30	2.720	272	0.8	6.0	2.530	246	0.4	3.0	1,980	195	0.375	3.0

절입량 Depth of Cut

Slotting
• Ap : Axial Depth
• D : Outside Diameter

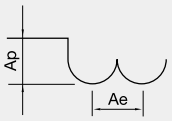


- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

2DINB

• RPM : rev./min • Feed : mm/min

피삭재 Material	흑연 Graphite			
반경 Radius	RPM	FEED	Ap Axial Depth	Ap Radial Depth
R 5	12740	4200	0.250	1.0
R 5.5	11580	3892	0.275	1.1
R 6	10600	3570	0.300	1.2
R 6.5	9800	3290	0.325	1.3
R 8	7960	3800	0.400	1.6
R 8.5	7490	3600	0.850	1.7
R 10	6370	3060	1.000	2.0
R 10.5	6000	2900	1.050	2.1
R 12.5	5100	2440	1.250	2.5
R 13	4900	2360	1.300	2.6
R 15	4250	2000	1.500	3.0
절입량 Depth of Cut			Ap : Axial Depth Ae : Radial Depth D : Outside Diameter n : Speed (min $^{-1}$) Vf : Feed (mm/min)	

2DINC

• RPM : rev./min • Feed : mm/min

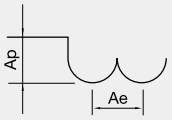
피삭재 Material	흑연 Graphite			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ap Radial Depth
ø 10	16560	2822	0.250	3.0
ø 11	15000	1862	0.275	3.3
ø 12	13780	1708	0.300	3.6
ø 13	12740	1582	0.325	3.9
ø 16	10350	1820	0.400	4.8
ø 17	9740	1720	0.850	5.1
ø 20	8280	1460	1.000	6.0
ø 21	7800	1400	1.050	6.3
ø 25	6630	1180	1.250	7.5
ø 26	6370	1140	1.300	7.8
ø 30	5520	1920	1.500	9.0
절입량 Depth of Cut	Slotting • Ap : Axial Depth • D : Outside Diameter			

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 인서트 체결 및 볼트의 조임을 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 흑연 가공 에어브로를 추천합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow is recommended for graphite milling.

4SFJB Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
반경 Corner 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
R 5	6370	2380	0.3	1.0	4750	1700	0.13	0.8	3100	620	0.13	0.8
R 5.5	5800	2125	0.3	1.1	4300	1550	0.14	0.8	2840	570	0.14	0.8
R 6	5300	1980	0.3	1.2	3950	1420	0.15	0.9	2600	520	0.15	0.9
R 6.5	4900	1836	0.3	1.3	3650	1300	0.16	1.0	2400	480	0.16	1.0
R 8	4000	1487	0.5	1.8	3000	1070	0.23	1.4	1950	390	0.23	1.4
R 8.5	3750	1402	0.5	1.9	2800	1000	0.24	1.4	1800	370	0.24	1.4
R 10	3180	1190	0.5	2.0	2370	850	0.25	1.5	1560	300	0.25	1.5
R 10.5	3000	1130	0.5	2.1	2260	800	0.26	1.6	1500	300	0.26	1.6
절입량 Depth of Cut					Ap : Axial Depth 축방향의절입깊이(mm) Ae : Radial Depth 반경방향의절입깊이(mm) D : Outside Diameter 외경(mm) n : Speed 회전속도 (min^{-1}) Vf : Feed 이송속도 (mm/min)							

- 유효장이 긴 경우에는 회전수와 이송속도를 최대 20% 이하로 줄이십시오.
- 열박음 후 완전히 밀착되었는지 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 공작기계와 가공물의 강성이 없는 경우 진동이 발생할시 조건표에 회전속도와 이송속도를 같은 비율로 줄여서 적용 합니다.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- In case of long effective length, reduce the RPM and feed by 20% or less.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- In case of workpiece and machine do not have enough rigidity and make vibration, reduce the RPM and feed in same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4SFJC Cutting Condition

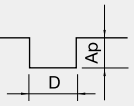
• RPM : rev./min • Feed : mm/min

홈절삭 Slotting

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Axial Depth	RPM	FEED	Ap Axial Depth	Ae Axial Depth	RPM	FEED	Ap Axial Depth	Ae Axial Depth
ø 10	1600	320	2.0	10	1440	288	1.0	10	800	130	1.0	8.0
ø 11	1450	290	2.2	11	1305	261	1.1	11	725	120	1.1	8.8
ø 12	1330	265	2.4	12	1197	239	1.2	12	660	100	1.2	9.6
ø 13	1225	245	2.6	13	1103	221	1.3	13	610	100	1.3	10.4
ø 16	1000	200	3.2	16	900	180	1.6	16	500	80	1.6	12.8
ø 17	940	190	3.4	17	846	171	1.7	17	470	75	1.7	13.6
ø 20	800	160	4.0	20	720	144	2.0	20	400	65	2.0	16.0
ø 21	760	150	4.2	21	684	135	2.1	21	380	60	2.1	16.8

절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter

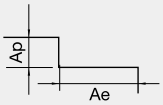


측면절삭 Side Cutting

피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 10	2050	500	5.0	1.0	2050	480	5.0	0.5	800	130	3.0	0.5
ø 11	1880	450	5.5	1.1	1880	420	5.5	0.6	730	120	3.3	0.6
ø 12	1720	410	6.0	1.2	1720	380	6.0	0.6	660	100	3.6	0.6
ø 13	1600	380	6.5	1.3	1600	350	6.5	0.7	610	100	3.9	0.7
ø 16	1300	310	8.0	1.6	1300	300	8.0	0.8	500	80	4.8	0.8
ø 17	1220	300	8.5	1.7	1220	285	8.5	0.9	470	75	5.1	0.9
ø 20	1000	250	10.0	2.0	1000	240	10.0	1.0	400	65	6.0	1.0
ø 21	980	230	10.5	2.1	980	220	10.5	1.1	380	60	6.3	1.1

절입량 Depth of Cut

Side Milling
- Ap : Axial Depth
- Ae : Radial Depth



- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 열박음 후 완전히 밀착되었는지 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

6~12SFJC Cutting Condition

• RPM : rev./min • Feed : mm/min

측면절삭 Side Cutting												
피삭재 Material	공구강 / 금형강 Tool steels / Mold steels SCM / HPM				합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M				고경도강 Hardened Steels STAVAX / SKD11			
경도 Hardness	30 ~ 40HRc				40 ~ 45HRc				45 ~ 55HRc			
외경 Outside Diameter	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 10	3075	1150	5.0	1.0	3075	1104	3.0	0.5	1200	299	3.0	0.5
ø 11	2820	1035	5.5	1.1	2820	966	3.3	0.6	1095	276	3.3	0.6
ø 12	2580	943	6.0	1.2	2580	874	3.6	0.6	990	230	3.6	0.6
ø 13	2400	874	6.5	1.3	2400	805	3.9	0.7	915	230	3.9	0.7
ø 16	1950	713	8.0	1.6	1950	690	4.8	0.8	750	184	4.8	0.8
ø 17	1830	690	8.5	1.7	1830	656	5.1	0.9	705	173	5.1	0.9
ø 20	1500	575	10.0	2.0	1500	552	6.0	1.0	600	150	6.0	1.0
ø 21	1470	529	10.5	2.1	1470	506	6.3	1.1	570	138	6.3	1.1
절입량 Depth of Cut	Side Milling • Ap : Axial Depth • Ae : Radial Depth											

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 열박음 후 완전히 밀착되었는지 확인 후 가공 하십시오.
- 상기 절삭 조건은 6날 기준이며 날 수 증가시 안정적인 속도 내에서 FEED를 UP 해주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 에어브로, 절삭유, 오일 미스트 쿨런트를 추천하며, 칩을 잘 제거하고 가공시 발열과 발화에 주의 하십시오

- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- Above the table value is based on 6 flutes. If you use more than 6 flutes of endmill, raise up the feed 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow or mist coolants are recommended and note for chip emission, heat, or ignition.

4SFDB

피삭재 Material	흑연 Graphite			
반경 Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial Depth
R 5	9550	3965	0.250	1.0
R 5.5	8700	3640	0.275	1.1
R 6	7960	3315	0.300	1.2
R 6.5	7350	3055	0.325	1.3
R 8	5970	2470	0.400	1.6
R 8.5	5620	2340	0.850	1.7
R 10	4780	1989	1.000	2.0
R 10.5	4550	1898	1.050	2.1
절입량 Depth of Cut	Ap : Axial Depth Ae : Radial Depth D : Outside Diameter n : Speed (min $^{-1}$) Vf : Feed (mm/min)			

4SFDC

피삭재 Material	흑연 Graphite			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 10	5100	4000	0.250	3.0
ø 11	4630	3700	0.275	3.3
ø 12	4250	3400	0.300	3.6
ø 13	3920	3125	0.325	3.9
ø 16	3180	2550	0.400	4.8
ø 17	3000	2400	0.850	5.1
ø 20	2550	2000	1.000	6.0
ø 21	2430	1950	1.050	6.3
절입량 Depth of Cut	Slotting • Ap : Axial Depth • D : Outside Diameter			

6~12SFDC

피삭재 Material	흑연 Graphite			
외경 Outside Diameter	RPM	FEED	Ap Axial Depth	Ae Radial Depth
ø 10	5100	4840	0.250	3.0
ø 11	4630	4477	0.275	3.3
ø 12	4250	4114	0.300	3.6
ø 13	3920	3781	0.325	3.9
ø 16	3180	3086	0.400	4.8
ø 17	3000	2904	0.850	5.1
ø 20	2550	2420	1.000	6.0
ø 21	2430	2360	1.050	6.3
절입량 Depth of Cut	Slotting • Ap : Axial Depth • D : Outside Diameter			

• RPM : rev./min • Feed : mm/min

- 유효장 길이가 긴 경우, RPM과 FEED를 동일 비율로 낮춰주세요.
- 열박음 후 완전히 밀착되었는지 확인 후 가공 하십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생 시 스핀들 속도와 이송 속도를 비례하여 조정 하십시오.
- 흑연 가공 에어브로를 추천합니다.

- If the effective length is long, reduce the RPM and feed in the same proportion.
- After the heat the shrink-fit, check the clamping and bolt status, and then use.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.
- Air blow is recommended for graphite milling.

PCD End Mill Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	VC m/mim	FEED RATE (fz)			
		2 ~ 3mm	4 ~ 6mm	7 ~ 11mm	12 ~ 20mm
AL-alloy Si 〈1%	150 ~ 6,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
AL-alloy Si 〈12%	150 ~ 4,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
AL-alloy Si 〉12%	150 ~ 2,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
Magnesium alloy	150 ~ 6,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
Cooper alloy	150 ~ 5,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
Brass ally	150 ~ 5,001	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
GFRP	150 ~ 3,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
CFRP	150 ~ 4,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
Graphite	150 ~ 3,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3

2SPO Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강 / 쾌삭강 Mild steels / Free cutting steel HP / SM		구조용강 / 탄소강 / 회주철 Structural steels / Carbon Steels /Gray cast irons SS / SC / FC		공구강 / 금형강 Tool steels / Mold steels SCM / HPM	
경도 Hardness	~200HB		~30HRc		30~ 40HRc	
외경 Outside Diameter	절삭속도 (V/C)	이송량 (f)	절삭속도 (V/C)	이송량 (f)	절삭속도 (V/C)	이송량 (f)
ø 1	23,800	500	20,000	400	19.100	380
ø 2	12,000	700	10,350	400	9.550	380
ø 3	8,000	800	6,900	550	6.400	510
ø 4	5,900	800	5,200	620	4.800	570
ø 6	3,980	700	3,450	550	3.180	510
ø 8	3,000	600	2,600	520	2.400	480
ø 10	2,400	580	2,070	500	2.000	460
ø 12	2,000	560	1,720	480	1.600	450
ø 16	1,500	500	1,300	400	1.200	380

- 진동이 적고 강성이 좋은 공작기계 사용요망합니다 (Ø1 이하 사용시 진동 허용 관리 3㎛이내 일것.)
- 가급적 열박음 척을 추천합니다.
- 상기 절삭 조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 3㎛).
- Using shrink-fit chuck is recommeded.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.

2STD Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM		덕타일 주철 Ductile cast irons FCD		스텐레스강 Stainless Steels SUS304/SUS316		알루미늄 합금 Aluminum alloys AL7075		인코넬 inconel	
경도Hardness	~200HB		~30HRc		30 ~ 40HRc									
직경 Diameter	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f
ø 3.4	60 ~100	0.1 ~ 0.2	60 ~100	0.1 ~ 0.2	20 ~ 60	0.05 ~ 0.1	40 ~ 70	0.07 ~ 0.2	20 ~ 60	0.05 ~ 0.2	80 ~ 120	0.1 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 4.3	60 ~100	0.1 ~ 0.2	60 ~100	0.1 ~ 0.2	20 ~ 60	0.05 ~ 0.1	40 ~ 70	0.07 ~ 0.2	20 ~ 60	0.05 ~ 0.2	80 ~ 120	0.1 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 5.1	60 ~100	0.1 ~ 0.2	60 ~100	0.1 ~ 0.2	20 ~ 60	0.05 ~ 0.1	40 ~ 70	0.07 ~ 0.2	20 ~ 60	0.05 ~ 0.2	80 ~ 120	0.1 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 6.9	60 ~100	0.15 ~ 0.3	60 ~100	0.15 ~ 0.3	20 ~ 60	0.08 ~ 0.2	40 ~ 70	0.1 ~ 0.2	20 ~ 60	0.1 ~ 0.2	80 ~ 120	0.15 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 8.6	60 ~100	0.15 ~ 0.3	60 ~100	0.15 ~ 0.3	20 ~ 60	0.08 ~ 0.2	40 ~ 70	0.1 ~ 0.2	20 ~ 60	0.1 ~ 0.2	80 ~ 120	0.15 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 10.3	60 ~100	0.2 ~ 0.4	60 ~100	0.2 ~ 0.4	20 ~ 60	0.1 ~ 0.2	40 ~ 70	0.2 ~ 0.4	20 ~ 60	0.15 ~ 0.3	80 ~ 120	0.2 ~ 0.4	10 ~ 30	0.1 ~ 0.2

- 상기 알루미늄 절삭조건은 A7075계열의 기준으로 작성 된 절삭조건으로 그 외에 알루미늄 계열의 드릴링 시 당사 연구소에 문의 바랍니다.
  (대표번호 02)808-2745 -연구소)
- 진동이 적고 강성이 좋은 공작기계 사용요망합니다 (Ø1 이하 사용시 진동 허용 관리 3㎛이내 일것.)
- 가급적 열박음 척을 추천합니다.
- 상기 절삭 조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- The above aluminum cutting conditions are based on the A7075 series, so please inquire with our staff for drilling conditions for other aluminum series.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 3㎛).
- Using shrink-fit chuck is recommeded.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.

2DED Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	알루미늄 합금 Aluminum alloys AL7075		ABS수지/아크릴 ABS resin / Acrylic	
직경 Diameter	RPM	이송량 (f)	RPM	이송량 (f)
ø0.1 ~ 0.3	25,000	0.001 ~ 0.003	22,000	0.001 ~ 0.003
ø0.3 ~ 0.5	20,000	0.005 ~ 0.02	22,000	0.005 ~ 0.01
ø0.5 ~ 0.8	18,000	0.01 ~ 0.03	15,000	0.01 ~ 0.03
ø0.8 ~ 1	15,000	0.02 ~ 0.04	13,000	0.02 ~ 0.05
ø1~1.5	12,000	0.03 ~ 0.05	8,000	0.02 ~ 0.05
ø1.5 ~ 2	9,000	0.03 ~ 0.05	6,000	0.02 ~ 0.05
ø2 ~ 3	7,000	0.03 ~ 0.05	4,500	0.05
ø3 ~ 4	3,500	0.03 ~ 0.05	3,200	0.05
ø4 ~ 5	2,800	0.03 ~ 0.05	2,500	0.05
ø5 ~ 6	2,200	0.03 ~ 0.05	2,000	0.05

- 상기 알루미늄 절삭조건은 A7075계열의 기준으로 작성 된 절삭조건으로 그 외에 알루미늄 계열의 드릴링 시 당사 연구소에 문의 바랍니다. (대표번호 02)808-2745 -연구소)
- 진동이 적고 강성이 좋은 공작기계 사용요망합니다 (Ø1 이하 사용시 진동 허용 관리 3㎛이내 일것.)
- 가급적 열박음 척을 추천합니다.
- 상기 절삭 조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- The above aluminum cutting conditions are based on the A7075 series, so please inquire with our staff for drilling conditions for other aluminum series.
- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 3㎛).
- Using shrink-fit chuck is recommeded.
- 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, or found red heat on the material, adjust RPM and feed in the same proportion.

2MID Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		알루미늄 합금 Aluminum alloys AL7075		동 Copper C1100	
경도 Hardness	~ 200HB		~30HRc		-		-	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø0.5	25,500	510	19,100	380	35,000	700	28,000	350
ø1	191,00	840	13,000	360	28,600	1,720	22,880	860
ø1.5	138,00	760	7,430	330	21,200	1,520	16,960	760
ø2	9,500	630	6,000	330	19,400	1,160	15,520	580
ø2.5	8,900	780	5,730	370	15,300	1,840	12,240	920
ø3	8,500	840	5,900	450	13,000	1,250	10,400	625

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다.(Ø1 이하 사용 시 진동 허용 관리 3㎛이내일것)
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.
- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please use a machine with low vibration and good rigidity (for Ø1 or below, keep vibration tolerance within 3㎛).
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

4DUBE(Standard length) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM		덕타일 주철 Ductile cast irons FCD	
경도 Hardness	~ 200HB		~ 30 HRc		30~40HRc		-	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø6	3,600	920	3,400	575	2,550	600	2,550	580
ø8	2,720	770	2,800	610	1,780	460	1,870	485
ø10	2,150	660	2,120	610	1,440	415	1,530	435
ø12	1,870	630	1,780	550	1,190	370	1,275	400

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

3DUBEH Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		고경도강 Hardened Steels STAVX / SKD11		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61		열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51	
경도 Hardness	40~45HRc		45~55HRc		55~62HRc		62~65HRc	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø3	3,820	232	2,636	127	1,910	86	1452	67
ø4	2,900	235	1,943	130	1,450	72	1088	55
ø5	2,400	211	1,584	119	1,200	66	900	46
ø6	1,910	195	1,320	108	1,000	60	730	36
ø8	1,440	150	965	90	720	45	540	27
ø10	1,177	120	783	72	580	36	435	22
ø12	998	105	653	60	480	30	360	18
ø16	720	75	486	45	360	23	270	14

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 상기 절삭 조건은 3Dc이하 조건입니다.
- 3Dc 초과로 절삭 시 스텝 가공을 실시 하십시오. 하지만 절삭 조건에 따라 칩 배출이 나빠질 수 있습니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- The cutting conditions above are 3Dc or less.
- When cutting more than 3Dc, perform step processing. However, depending on the cutting conditions, chip emissions can get worse.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBES(3XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	구조용강/탄소강/회주철 Structural steels / Carbon Steels / Gray cast irons SS / SC / FC		공구강/금형강 Tool Steels / Pre-hardened Steels SCM / HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		고경도강 Hardened Steels STAVX / SKD11	
경도 Hardness	~30HRc		30~40HRc		40~45HRc		45~55HRc	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø1	15,900	440	11,000	360	9,450	310	8,900	200
ø2	7,900	520	6,000	390	5,000	220	4,500	200
ø3	6,900	770	5,900	450	4,300	250	4,000	230
ø4	5,170	850	4,500	450	3,200	280	3,000	250
ø5	4,140	820	3,450	570	3,000	360	2,450	310
ø6	3,450	840	3,000	570	3,000	330	2,010	310
ø8	2,580	860	2,100	440	1,700	280	1,520	260
ø10	2,070	680	1,700	400	1,300	220	1,210	220
ø12	1,730	560	1,400	350	1,050	200	1,000	200
ø16	1,300	440	1,150	340	800	170	750	170
ø20	1,030	390	950	340	650	170	600	170

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBES(5XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	구조용강/탄소강/회주철 Structural steels / Carbon Steels / Gray cast irons SS / SC / FC		공구강/금형강 Tool Steels / Pre-hardened Steels SCM / HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		고경도강 Hardened Steels STAVX / SKD11	
경도 Hardness	~ 30HRc		30 ~ 40HRc		40 ~ 45HRc		45~55HRc	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
1mm	15,900	400	11,000	330	9,450	280	8,900	180
2mm	7,900	470	6,000	350	5,000	200	4,500	180
3mm	6,900	700	5,900	410	4,300	230	4,000	210
4mm	5,170	770	4,500	410	3,200	250	3,000	230
5mm	4,140	745	3,450	520	3,000	330	2,450	280
6mm	3,450	760	3,000	520	3,000	300	2,010	280
8mm	2,580	780	2,100	400	1,700	250	1,520	240
10mm	2,070	620	1,700	360	1,300	200	1,210	200
12mm	1,730	510	1,400	320	1,050	180	1,000	180
16mm	1,300	400	1,150	310	800	150	750	150
20mm	1,030	350	950	310	650	150	600	150

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBE(Short length) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM		덕타일 주철 Ductile cast irons FCD	
경도 Hardness	~ 200HB		~ 30HRc		30~40HRc		-	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø1	19,100	840	19,200	430	13,000	360	11,500	385
ø2	9,500	630	9,700	430	6,000	330	6,100	330
ø3	8,500	840	8,200	360	5,900	450	5,950	460
ø4	6,400	770	6,500	430	4,500	450	4,400	440
ø5	5,000	940	5,200	680	3,450	550	3,500	560
ø6	4,250	880	4,500	600	4,000	550	3,000	560
ø8	3,200	740	3,300	580	2,100	440	2,200	460
ø10	2,550	640	2,500	580	1,700	400	1,800	420
ø12	2,200	600	2,100	530	1,400	350	1,500	390

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBE(Standard length) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM		덕타일 주철 Ductile cast irons FCD	
경도 Hardness	~ 200HB		~ 30HRc		30~40HRc		-	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø1	19,100	760	19,200	390	13,000	330	11,500	350
ø2	9,500	570	9,700	390	6,000	300	6,100	300
ø3	8,500	760	8,200	330	5,900	410	5,950	420
ø4	6,400	700	6,500	390	4,500	410	4,400	400
ø5	5,000	850	5,200	620	3,450	520	3,500	510
ø6	4,250	800	4,500	550	4,000	500	3,000	510
ø8	3,200	670	3,300	530	2,100	400	2,200	420
ø10	2,550	850	2,500	530	1,700	360	1,800	380
ø12	2,200	550	2,100	480	1,400	320	1,500	350
ø16	1,600	530	1,600	430	1,150	310	1,100	300
ø20	1,300	450	1,300	430	950	310	900	300

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBEV(3XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM		덕타일 주철 Ductile cast irons FCD	
경도 Hardness	~ 200HB		~ 30HRc		30~40HRc		-	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø1	19,100	840	19,200	430	13,000	360	11,500	385
ø2	9,500	630	9,700	430	6,000	330	6,100	330
ø3	8,500	840	8,200	360	5,900	450	5,950	460
ø4	6,400	770	6,500	430	4,500	450	4,400	440
ø5	5,000	940	5,200	680	3,450	550	3,500	560
ø6	4,250	880	4,500	600	4,000	550	3,000	560
ø8	3,200	740	3,300	580	2,100	440	2,200	460
ø10	2,550	640	2,500	580	1,700	400	1,800	420
ø12	2,200	600	2,100	530	1,400	350	1,500	390
ø16	1,600	580	1,600	470	1,150	340	1,100	330
ø20	1,300	500	1,300	470	950	340	900	330

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBEV(5XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool steels / Mold steels SCM/HPM		덕타일 주철 Ductile cast irons FCD	
경도 Hardness	~ 200HB		~ 30HRc		30~40HRc		-	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø1	19,100	760	19,200	390	13,000	330	11,500	350
ø2	9,500	570	9,700	390	6,000	300	6,100	300
ø3	8,500	760	8,200	330	5,900	410	5,950	420
ø4	6,400	700	6,500	390	4,500	410	4,400	400
ø5	5,000	850	5,200	620	3,450	500	3,500	510
ø6	4,250	800	4,500	550	4,000	500	3,000	510
ø8	3,200	670	3,300	530	2,100	400	2,200	420
ø10	2,550	580	2,500	530	1,700	360	1,800	380
ø12	2,200	550	2,100	480	1,400	320	1,500	350
ø16	1,600	430	1,600	530	1,150	310	1,100	300
ø20	1,300	450	1,300	430	950	310	900	300

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBEW(3XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		덕타일 주철 Ductile cast irons FCD		스테인레스강 Stainless Steels SUS304/SUS316	
경도 Hardness	~200HB		~30HRc		-		-	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø1	19,000	530	13,200	430	13,200	460	19,150	830
ø2	9,480	620	7,200	460	7,010	400	9,550	630
ø3	8,280	920	7,080	540	6,840	550	8,400	830
ø4	6,200	1010	5,400	540	5,060	550	6,350	770
ø5	4,970	980	4,140	690	4,025	670	5,100	715
ø6	4,140	1000	3,600	690	3,450	670	4,200	660
ø8	3,100	1030	2,520	530	2,530	550	3,200	740
ø10	2,500	830	2,040	470	2,070	500	2,550	700
ø12	2,100	670	1,680	420	1,725	460	2,100	580
ø16	1,560	530	1,380	410	1,265	400	1,600	510
ø20	1,240	460	1,140	410	1,035	400	1,250	480

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- Peck(Q) drilling 간격은 외부 쿨런트 타입 0.2Dc~0.5Dc, 내부 쿨런트 타입 0.2Dc~1.5Dc를 권장합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- For peck (Q) drilling, we recommend intervals of 0.2Dc to 0.5Dc for external coolant types and 0.2Dc to 1.5Dc for internal coolant types.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBEW(5XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		덕타일 주철 Ductile cast irons FCD		스테인레스강 Stainless Steels SUS304/SUS316	
경도 Hardness	~200HB		~30HRc		-		-	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø1	19,000	480	13,200	390	13,200	420	19,150	750
ø2	9,480	560	7,200	420	7,010	360	9,550	570
ø3	8,280	840	7,080	490	6,840	500	8,400	750
ø4	6,200	920	5,400	490	5,060	500	6,350	700
ø5	4,970	890	4,140	625	4,025	610	5,100	650
ø6	4,140	910	3,600	625	3,450	610	4,200	600
ø8	3,100	940	2,520	480	2,530	500	3,200	670
ø10	2,500	750	2,040	430	2,070	455	2,550	640
ø12	2,100	610	1,680	380	1,725	420	2,100	525
ø16	1,560	480	1,380	370	1,265	360	1,600	460
ø20	1,240	420	1,140	370	1,035	360	1,250	440

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- Peck(Q) drilling 간격은 외부 쿨런트 타입 0.2Dc~0.5Dc, 내부 쿨런트 타입 0.2Dc~1.5Dc를 권장합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- For peck (Q) drilling, we recommend intervals of 0.2Dc to 0.5Dc for external coolant types and 0.2Dc to 1.5Dc for internal coolant types.
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBEN(3XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	알루미늄 합금 주물 Aluminum alloy castings AC48		알루미늄 합금 Aluminum alloy AL7075		ABS수지/아크릴 ABS resin / Acrylic	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø1	28,600	1,720	25,740	1,540	10,500	210
ø2	19,400	1,160	17,460	1,050	7,000	210
ø3	13,000	1,250	11,700	1,120	5,250	260
ø4	9,650	1,160	8,685	1,040	3,850	190
ø5	7,800	1,120	7,020	1,010	2,850	140
ø6	6,500	840	5,850	760	2,250	110
ø8	4,850	870	4,365	790	1,800	90
ø10	3,900	800	3,510	720	1,450	70
ø12	3,200	770	2,880	700	1,200	60
ø13	3,000	800	2,700	710	1,100	55

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다.(Ø1 이하 사용 시 진동 허용 관리 3㎛이내일것)
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- Please use a machine with low vibration and good rigidity (for Ø1 or below, keep vibration tolerance within 3㎛).
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2DUBEN(5XD) Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	알루미늄 합금 주물 Aluminum alloy castings AC48		알루미늄 합금 Aluminum alloy AL7075		ABS수지/아크릴 ABS resin / Acrylic	
외경 Outside Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø1	28,600	1,430	25,740	1,290	10,500	168
ø2	19,400	970	17,460	870	7,000	168
ø3	13,000	1,040	11,700	940	5,250	208
ø4	9,650	970	8,685	870	3,850	152
ø5	7,800	940	7,020	850	2,850	112
ø6	6,500	700	5,850	630	2,250	88
ø8	4,850	730	4,365	660	1,800	72
ø10	3,900	660	3,510	600	1,450	56
ø12	3,200	640	2,880	580	1,200	48
ø13	3,000	660	2,700	600	1,100	44

- 피삭재의 고정이 불안정 할 시 내구성이 떨어지므로, 확실한 클램핑을 하십시오.
- 원활한 칩 배출을 위해 절삭유 사용을 권장하며, 수용성 절삭유가 효과적입니다.
- 상기 절삭 조건은 참고 수치이므로, 실 가공 시 가공 형상, 가공 목적, 적용 기계에 따라 조건 변경 요망합니다.
- 절삭하는 피삭재의 따라 구멍깊이 최대 5xDc 이상의 드릴링 시 peck(Q) 절입량을 변경하십시오.
- 진동이 적고 강성이 좋은 공작기계 사용 요망합니다.(Ø1 이하 사용 시 진동 허용 관리 3㎛이내일것)
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할 때 스핀들 속도와 이송 속도를 비례하여 조정하십시오.

- Ensure a stable clamping when fixing the cutting tool, as durability may be compromised if the clamping is unstable.
- For smooth chip evacuation, we recommend using cutting oil, and a soluble cutting fluid is effective as well.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Please adjust the peck (Q) feed rate when drilling with a cutting tool that has a depth of cut (Dc) exceeding 5 times the diameter.
- Please use a machine with low vibration and good rigidity (for Ø1 or below, keep vibration tolerance within 3㎛).
- If the cutting conditions exceed the maximum spindle speed of the machine or if chattering and thermal phenomena occur, adjust the spindle speed and feed rate proportionally.

2FDR Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool Steels / Mold steels SCM/HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M		덕타일 주철 Ductile cast irons FCD		스테인레스강 Stainless Steels SUS304/SUS316	
경도 Hardness	~200HB		~30HRc		30 ~ 40HRc		40 ~ 45HRc		-		-	
외경 Diameter	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED
ø 0.2	33000	35	29500	40	16500	25	14000	15	29500	30	16200	15
ø 0.3	31500	55	25000	40	15500	30	12500	15	26500	35	15300	15
ø 0.4	27500	75	23800	50	14500	35	11500	20	23200	40	14500	20
ø 0.5	25800	85	22000	60	13200	40	11000	25	21500	45	13200	20
ø 0.6	24600	115	20500	85	12000	55	10000	25	20000	60	12000	25
ø 0.7	22500	135	19500	115	11000	70	9000	30	18500	90	11500	30
ø 0.8	21000	180	18000	150	10500	80	8000	35	17000	120	10000	35
ø 0.9	20500	240	16800	190	9500	95	7500	35	16000	145	9850	40
ø 1	19500	300	16000	230	9450	110	6800	35	15700	180	9600	50
ø 2	12000	340	10000	290	5800	150	4100	60	10000	230	-	-
ø 3	8000	410	7100	330	3800	165	2700	70	7100	280	-	-
ø 4	6100	425	5200	380	2700	170	2100	80	5250	300	-	-
ø 5	4900	425	4200	280	2350	175	1650	80	4250	300	-	-
ø 6	4150	425	3550	330	1800	175	1350	80	3550	300	-	-
ø 8	3100	430	2700	350	1500	175	1000	80	2700	300	-	-
ø 10	2600	430	2200	360	1100	175	850	80	2000	300	-	-
ø 12	2100	430	1750	360	950	175	630	80	1800	310	-	-
ø 18	1600	430	1400	360	750	175	520	80	1350	310	-	-
ø 20	1250	430	1100	360	600	175	430	80	1000	310	-	-

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을시, 회전과 속도를 20% 줄여 사용하십시오.
- 절삭하는 피삭재에 따라 드릴링의 최종깊이가 직경대비 2배 이상 시 펙 드릴링 방식을 권장합니다.
- 경사 드릴 가공시, 경사진 각도에 따라(절삭 조건을) 조절하십시오. 경사각이 30도 이하일 때, 피드를 50% 낮추십시오.
  경사각이 30도 이상일 때, 회전을 70% 이하, 피드를30% 이하로 줄이십시오.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- When the final depth of drilling exceeds twice the diameter relative to the cutting material, we recommend using peck drilling method.
- For stainless drilling, we recommend that the tool diameter is 1.9mm or less.
- If you use for inclined angle as slope drilling, reduce the feed by 50% for inclined angle less than 30˚, and reduce below 70% of the RPM and 30% of the feed for inclined angle over 30˚.
- Do not use for side milling.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

2FDRL Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool Steels / Mold steels SCM/HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M		덕타일 주철 FCD	
경도 Hardness	~200HB		~30HRc		30 ~ 40HRc		40 ~ 45HRc		-	
외경 Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송 속도 FEED
ø 3	11000	800	9500	580	7500	320	5000	220	9300	400
ø 4	8000	800	7200	580	5600	320	4100	220	7300	400
ø 5	6500	800	5550	580	4500	320	3300	220	6000	400
ø 6	5500	810	4800	590	3550	320	2700	220	5000	400
ø 8	4100	810	3600	590	2850	320	2000	220	3800	400
ø 10	3300	810	3000	590	2350	320	1650	220	3000	410
ø 12	2750	820	2450	600	2000	320	1480	220	2480	410
ø 16	2100	820	1800	600	1550	330	1000	220	1850	410
ø 20	1650	820	1550	600	1250	330	850	220	1550	410

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을 시, 회전과 이송속도를 20% 줄여 사용하십시오.
- 절삭하는 피삭재에 따라 드릴링의 최종깊이가 직경대비 2배 이상 시 펙 드릴링 방식을 권장합니다.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- When the final depth of drilling exceeds twice the diameter relative to the cutting material, we recommend using peck drilling method.
- Do not use for stainless material. We recommend using 2FDRW or 2FDRLW for stainless material.
- Do not use for side milling.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

2FDRW Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool Steels / Mold steels SCM/HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M		덕타일 주철 Ductile cast irons FCD		스테인레스강 Stainless Steels SUS304/SUS316	
경도 Hardness	~200HB		~30HRc		30 ~ 40HRc		40 ~ 45HRc		-		-	
외경 Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
Ø3	12500	900	10000	600	7500	300	6500	270	10000	450	10000	600
Ø4	9500	930	8000	620	5500	300	4800	270	8000	450	8000	600
Ø5	7500	930	6500	620	4500	300	3800	270	6300	460	6300	620
Ø6	6500	950	5400	630	3700	330	3200	280	5400	470	5500	620
Ø8	4800	950	4000	630	2900	330	2500	280	4000	470	4000	620
Ø10	3800	950	3300	630	2450	330	2000	280	3200	470	3300	620
Ø12	3300	950	2800	630	2000	330	1600	280	2800	470	2900	620
Ø16	2500	950	2000	630	1500	330	1300	280	2000	470	2000	620

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을 시, 회전과 속도를 20% 줄여 사용하십시오.
- 드릴 깊이는 3xDc를 넘기지 마십시오. 칩 배출 상태가 좋지 않을 경우, 펙드릴링 방식을 사용하십시오.
- 펙드릴 간격은 0.1Dc ~ 0.5Dc 사이를 권장합니다.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- Do not over the drilling depth of 3 x Dc. If the state of chip emission is not good enough, use peck drilling method.
- For the stainless material, use peck drilling method.
- Peck drill interval is recommended between 0.1 Dc to 0.5 Dc.
- Side milling is not possible.
- Change cutting conditions depending on work variables: rigidity of machine, work clamp or material shape.

2FDRLW Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	일반구조강/쾌삭강 Mild Steels/Free cutting steels HP/SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강/금형강 Tool Steels / Mold steels SCM/HPM		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M		덕타일 주철 Ductile cast irons FCD		스테인레스강 Stainless Steels SUS304/SUS316	
경도 Hardness	~200HB		~30HRc		30 ~ 40HRc		40 ~ 45HRc		-		-	
외경 Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
Ø3	15000	1250	10000	600	7300	300	6500	270	10000	460	10000	600
Ø4	11000	1300	8000	600	5500	300	4800	270	8000	460	8000	620
Ø5	9000	1300	6400	600	4500	300	3800	270	6500	460	6500	620
Ø6	7500	1350	5300	630	3700	320	3200	280	5300	480	5300	630
Ø8	5600	1350	4000	630	2800	320	2500	280	4000	480	4000	630
Ø10	4500	1350	3200	630	2300	320	2000	280	3200	480	3300	630
Ø12	3700	1350	2800	630	2000	320	1700	280	2900	480	2800	630
Ø16	2850	1350	2100	630	1500	320	1300	280	2100	480	2100	630

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을 시, 회전과 속도를 20% 줄여 사용하십시오.
- 드릴 깊이는 5xDc를 넘기지 마십시오. 칩 배출 상태가 좋지 않을 경우, 펙드릴링 방식을 사용하십시오.
- 펙드릴 간격은 0.1Dc ~ 0.5Dc 사이를 권장합니다.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- Do not over the drilling depth of 5 x Dc. If the state of chip emission is not good enough, use peck drilling method.
- For the stainless material, use peck drilling method.
- Peck drill interval is recommended between 0.1 Dc to 0.5 Dc.
- Side milling is not possible.
- Change cutting conditions depending on work variables: rigidity of machine, work clamp or material shape.

추천 절삭조건표 Recommended Cutting Conditions

4ETM(R)

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		합금강/프리하든강 Alloy Steels / Pre-hardened Steels NAK80/KP4M	
경도 Hardness					~30HRc		40 ~ 45HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M3	120~250	0.02 ~ 0.03	70 ~ 80	0.01 ~ 0.015	60 ~ 70	0.01 ~ 0.015	45 ~ 55	0.005 ~ 0.01
M4		0.02 ~ 0.03		0.01 ~ 0.015		0.01 ~ 0.015		0.005 ~ 0.01
M5		0.02 ~ 0.03		0.01 ~ 0.015		0.01 ~ 0.015		0.005 ~ 0.01
M6		0.03 ~ 0.04		0.015 ~ 0.02		0.015 ~ 0.02		0.01 ~ 0.015
M8		0.03 ~ 0.04		0.015 ~ 0.02		0.015 ~ 0.02		0.01 ~ 0.015
M10		0.04 ~ 0.05		0.015 ~ 0.02		0.015 ~ 0.02		0.015 ~ 0.02
M12		0.04 ~ 0.05		0.015 ~ 0.02		0.015 ~ 0.02		0.015 ~ 0.02
M16~M23		0.05 ~ 0.07		0.025 ~ 0.03		0.025 ~ 0.03		0.015 ~ 0.02

2DTM

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		비철금속 Non-ferrous metal	
TAP	V/C	FZ	V/C	FZ
M3	200~250	0.03 ~ 0.04	250~300	0.03 ~ 0.04
M4		0.03 ~ 0.04		0.03 ~ 0.04
M5		0.03 ~ 0.04		0.03 ~ 0.04
M6		0.04 ~ 0.05		0.04 ~ 0.05
M8		0.04 ~ 0.05		0.04 ~ 0.05
M10		0.05 ~ 0.06		0.05 ~ 0.06
M12		0.06 ~ 0.07		0.06 ~ 0.07
M16		0.06 ~ 0.07		0.06 ~ 0.07

4IMTM

피삭재 Work Material	티타늄 합금 Titanium Alloys	
TAP	V/C	FZ
M0.8 ~ M1	20 ~ 60	0.005 ~ 0.01
M1 ~ M2		0.005 ~ 0.01
M 2.5		0.005 ~ 0.01
M 2.6		0.005 ~ 0.01

4TRTM(S)

피삭재 Work Material	스테인레스강 Stainless steels SUS304 / SUS316		일반구조강 / 쾌삭강 Mild Steels / Free cutting steels HP / SM		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		공구강 / 금형강 Tool steels / Mold steels SCM / HPM	
경도 Hardness			~ 200HB		~ 30HRc		30 ~ 40HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
Tr8, Tr9	70 ~ 80	0.02 ~ 0.03	60 ~ 70	0.02 ~ 0.03	50 ~ 60	0.01 ~ 0.02	40 ~ 50	0.01 ~ 0.02
Tr10, Tr11		0.02 ~ 0.03		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02
Tr12, Tr14		0.03 ~ 0.04		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
Tr12		0.03 ~ 0.04		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
Tr14, Tr22		0.03 ~ 0.04		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
Tr16, Tr18, Tr20		0.03 ~ 0.04		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
Tr22, Tr24, Tr26		0.03 ~ 0.04		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03

- 파지력이 좋은 열박음 척 사용을 추천 합니다.
- 떨림방지를 위한 부등분할 설계로, 공구 진입 시 f1 (mm/tooth) 기준으로 나사가공 이송대비 50% 수준으로 낮춰 주십시오.
- 상기 절삭조건은 참고 수치이므로 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 절삭시 내,외부 급유형 쿨런트 사용을 추천합니다.

- Using shrink-fit chuck with great holding power is recommeded.
- When the tool approaches the work material, reduce the feed by 50%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Internal and external coolants are recommended for milling.

추천 절삭조건표 Recommended Cutting Conditions

4MTM

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness					40 ~ 45HRc		55 ~ 62HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M1	120 ~ 250	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02	50 ~ 60	0.01 ~ 0.02	40 ~ 50	0.008 ~ 0.01
M2		0.03 ~ 0.04		0.01 ~ 0.02		0.01 ~ 0.02		0.008 ~ 0.01
M3		0.03 ~ 0.04		0.01 ~ 0.02		0.01 ~ 0.02		0.01 ~ 0.02
M4		0.04 ~ 0.05		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02
M6		0.04 ~ 0.05		0.02 ~ 0.03		0.02 ~ 0.03		0.02 ~ 0.03
M8		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
M10		0.06 ~ 0.07		0.05 ~ 0.06		0.02 ~ 0.03		0.02 ~ 0.03
M12		0.06 ~ 0.07		0.05 ~ 0.06		0.03 ~ 0.04		0.03 ~ 0.04

4BSP(T)

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness					40 ~ 45HRc		55 ~ 58HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
1/16/28C	120 ~ 250	0.04 ~ 0.05	70 ~ 85	0.02 ~ 0.03	50 ~ 60	0.02 ~ 0.03	40 ~ 50	0.02 ~ 0.03
1/4/19C		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
1/2/14C		0.06 ~ 0.07		0.05 ~ 0.06		0.02 ~ 0.03		0.02 ~ 0.03
1"/11C		0.06 ~ 0.07		0.05 ~ 0.06		0.03 ~ 0.04		0.03 ~ 0.04

4HBSP

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M	
경도 Hardness					~ 30 HRc		40 ~ 45HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
1/16/28C	120 ~ 150	0.03 ~ 0.04	70 ~ 85	0.02 ~ 0.03	50 ~ 65	0.01 ~ 0.02	40 ~ 50	0.01 ~ 0.02
1/4/19C		0.03 ~ 0.04		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02
1/2/14C		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
1"/11C		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03

- 파지력이 좋은 열박음 척 사용을 추천 합니다.
- 떨림방지를 위한 부등분할 설계로, 공구 진입 시 f1 (mm/tooth) 기준으로 나사가공 이송대비 50% 수준으로 낮춰 주십시오.
- 상기 절삭조건은 참고 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 절삭시 내,외부 급유형 쿨런트 사용을 추천합니다.

- Using shrink-fit chuck with great holding power is recommeded.
- When the tool approaches the work material, reduce the feed by 50%.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- Internal and external coolants are recommended for milling.

추천 절삭조건표 Recommended Cutting Conditions

4STM

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness					40 ~ 45HRc		55 ~ 62HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M1 ~ m3	120 ~ 250	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02	50 ~ 60	0.01 ~ 0.02	40 ~ 50	0.008 ~ 0.01
M4		0.03 ~ 0.04		0.01 ~ 0.02		0.01 ~ 0.02		0.008 ~ 0.01
M5		0.03 ~ 0.04		0.01 ~ 0.02		0.01 ~ 0.02		0.01 ~ 0.02
M6		0.04 ~ 0.05		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02
M8		0.04 ~ 0.05		0.02 ~ 0.03		0.02 ~ 0.03		0.02 ~ 0.03
M10		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
M12		0.06 ~ 0.07		0.05 ~ 0.06		0.02 ~ 0.03		0.02 ~ 0.03
M16 ~ M20		0.06 ~ 0.07		0.05 ~ 0.06		0.03 ~ 0.04		0.03 ~ 0.04

4HTM/4LTM

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness					~ 30HRC		40 ~ 45HRC	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M3	120 ~ 150	0.02 ~ 0.03	70 ~ 85	0.01 ~ 0.02	50 ~ 65	0.01 ~ 0.02	40 ~ 50	0.008 ~ 0.01
M4		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02		0.008 ~ 0.01
M5		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02		0.01 ~ 0.02
M6		0.03 ~ 0.04		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02
M8		0.03 ~ 0.04		0.02 ~ 0.03		0.01 ~ 0.02		0.02 ~ 0.03
M10		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
M12		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
M16 ~ M20		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03

4NKTM

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness					40 ~ 45HRc		55 ~ 62HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
M3	120 ~ 150	0.03 ~ 0.04	70 ~ 85	0.01 ~ 0.02	50 ~ 65	0.01 ~ 0.02	40 ~ 55	0.008 ~ 0.01
M4		0.03 ~ 0.04		0.01 ~ 0.02		0.01 ~ 0.02		0.008 ~ 0.01
M5		0.03 ~ 0.04		0.01 ~ 0.02		0.01 ~ 0.02		0.01 ~ 0.02
M6		0.04 ~ 0.05		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02
M8		0.04 ~ 0.05		0.02 ~ 0.03		0.02 ~ 0.03		0.02 ~ 0.03
M10		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
M12		0.06 ~ 0.07		0.05 ~ 0.06		0.02 ~ 0.03		0.02 ~ 0.03
M16		0.06 ~ 0.07		0.05 ~ 0.06		0.03 ~ 0.04		0.03 ~ 0.04
M20		0.06 ~ 0.07		0.05 ~ 0.06		0.03 ~ 0.04		0.03 ~ 0.04

추천 절삭조건표 Recommended Cutting Conditions

4BSTM

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M	
경도 Hardness					~30HRc		40~45HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
1/16.28C BSPT	120 ~ 150	0.03 ~ 0.04	70 ~ 85	0.02 ~ 0.03	50 ~ 65	0.01 ~ 0.02	40 ~ 50	0.01 ~ 0.02
1/8/28C BSPT		0.03 ~ 0.04		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02
1/4.19C BSPT		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
3/8.19C BSPT		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
1/2(3/4).14C BSPT		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
1".11C BSPT		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03

4NPTS

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M		열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61	
경도 Hardness					40 ~ 45HRc		55 ~ 62HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
1/16/27C	120 ~ 250	0.04 ~ 0.05	70 ~ 85	0.02 ~ 0.03	50 ~ 60	0.02 ~ 0.03	40 ~ 50	0.02 ~ 0.03
1/4/18C		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
1/2/14C		0.06 ~ 0.07		0.05 ~ 0.06		0.02 ~ 0.03		0.02 ~ 0.03
1"/11.5C		0.06 ~ 0.07		0.05 ~ 0.06		0.03 ~ 0.04		0.03 ~ 0.04

4NPTM

피삭재 Work Material	알루미늄 합금 Aluminum alloys AL7075		스테인레스강 Stainless steels SUS304 / SUS316		구조용강/탄소강/회주철 Structural steels / Carbon Steels /Gray cast irons SS/SC/FC		합금강 / 프리하든강 Alloy Steels / Pre-hardened Steels NAK80 / KP4M	
경도 Hardness					~30HRc		40 ~ 45HRc	
TAP	V/C	FZ	V/C	FZ	V/C	FZ	V/C	FZ
1/16.27C NPT	120 ~ 150	0.03 ~ 0.04	70 ~ 85	0.02 ~ 0.03	50 ~ 85	0.01 ~ 0.02	40 ~ 50	0.01 ~ 0.02
1/8/27C NPT		0.03 ~ 0.04		0.02 ~ 0.03		0.01 ~ 0.02		0.01 ~ 0.02
1/4.18C NPT		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
3/8.18C NPT		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03
1/2(3/4),14C NPT		0.05 ~ 0.06		0.03 ~ 0.04		0.02 ~ 0.03		0.02 ~ 0.03

절삭조건 계산공식

회전수(N) : N=1000xV/πxD

V : 절삭속도
π : 3.14(원주율)
D : 공구직경

분당이송 : F=fxZxN

f : 회전당 이송
z : 날 수
N : 회전 수

- 절삭하는 피삭재에 따라 절입 횟수를 변경하십시오.(열처리 강 나사 가공 시 3회 이상의 절입을 권장합니다.)
- 나사플러그 게이지 측정 후 경 보정값을 수정하십시오.
- 긴 유효장 타입의 제품을 사용 시 나사가공 이송속도를 줄여주십시오.
- 가급적 열박음 척을 추천 합니다.
- 공구 진입 시 이송 f(mm/tooth)을 나사가공 이송 대비 30% 수준으로 낮춰주십시오.
- 상기 절삭조건은 참고 수치입니다. 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망합니다.

- Change the number of feeds according to the workpiece material.
  (Three or more feeds are recommended for thread milling of hardened steel.)
- Modify the diameter correction value after measuring the gauge of screw plug.
- When using the tool with long effective length, please reduce the speed of threading feed.
  Shrink fit chuck is recommended.
- During the approach of the tool to the workpiece, please reduce the feed F value (mm/tooth) to 30% of the feed for threading.
- The above cutting condition is just for reference.
- You may modify depending on the processing shape, purpose of processing, and the machine you use.

엔드밀 재연삭 가격 안내

초경 Ball & Radius 엔드밀

• 부등분할 : ×1.5 • C작업시 : ×0.9

날경		6이하	10이하	12이하	16이하	20이하	25이하
무코팅	2날	6,100	6,600	7,700	9,900	13,200	16,500
	3, 4, 6날	8,300	9,400	11,000	12,100	16,500	22,000
TISIN코팅	2날	8,300	9,500	10,900	13,400	19,100	20,900
	3, 4, 6날	10,300	12,500	13,400	15,200	23,800	26,400

초경 엔드밀 절단& 밑날

• 부등분할 : ×1.1 • 라핑시 : ×1.1

날경		6이하	10이하	12이하	16이하	20이하	25이하
무코팅	2날	4,200	4,800	6,400	8,500	10,700	13,900
	3, 4, 6날	5,300	5,900	7,500	10,700	12,300	17,100
TISIN코팅	2날	4,800	5,200	7,100	10,100	12,400	15,200
	3, 4, 6날	5,800	6,300	8,500	12,400	13,800	18,200

초경 다이아 절단& 밑날

날경	6이하	10이하	12이하	16이하	20이하	25이하
2날	9,500	10,750	14,500	19,250	24,250	31,500
3, 4, 6날	12,000	13,250	17,000	24,250	27,750	38,750

초경 Taper 엔드밀 외경연삭

• 30 도 미만 제작수리: ×2
• 30 도 이상 제작수리: ×1.5

생크경 (Ø)	6이하	8이하	10이하	12이하	16이하	20이하	25이하	32이하
2˚미만	10,900	12,100	13,400	14,600	18,200	24,200	30,300	36,300
2˚이상	10,900	12,100	14,600	17,000	21,800	29,100	33,900	38,800
30˚이상	7,300	8,500	9,700	10,900	13,400	18,200	23,000	30,300

초경 엔드밀 외경연삭

• Long : ×1.2 • EX.Long: ×1.5

날경	6이하	12이하	16이하	20이하	25이하	30이하
2날	4,900	6,100	8,500	12,100	18,200	25,500
4날	6,100	7,300	9,700	14,600	21,800	30,300

• 골수리(홈연삭) : X2

초경 High Helix 엔드밀 외경연삭

• Long : ×1.2 • EX.Long: ×1.5

날경	6이하	12이하	16이하	20이하	25이하	32이하
4날	11,000	13,200	16,500	19,800	30,800	36,300
6날	12,100	14,600	18,200	21,800	33,900	40,000

• 골수리(홈연삭) : X2

날붙이(BG) 초경 엔드밀 외경연삭

• Long : ×1.5 • EX.Long: ×2

날경	20이하	30이하	40이하	50이하
2날	6,100	9,700	12,100	18,200
4날	7,300	10,900	14,600	24,200

• 골수리(홈연삭) : X2

초경 엔드밀 TISIN 코팅 가격

• Long : ×1.5 (전장 150L 이상)

날경	6이하	8이하	10이하	12이하	16이하	20이하	25이하	32이하
-	2,100	2,600	3,500	4,700	8,800	10,500	15,200	21,100

초경 엔드밀 JJ 코팅 가격

• Long : ×1.5 (전장 150L 이상)

날경	6이하	8이하	10이하	12이하	16이하	20이하	25이하	32이하
-	2,500	3,100	4,200	5,600	10,500	12,700	18,300	25,400

HSS Taper 엔드밀

• Long : ×1.5 • 제작수리 : ×2 • 역 : ×2

생크경 (Ø)	16이하	20이하	25이하	32이하	35이하
2˚미만	8,500	9,700	10,900	14,600	18,200
2˚이상	9,700	12,100	14,600	18,200	21,800
30˚이상	7,300	8,500	9,700	12,100	14,600

HSS 엔드밀 외경연삭

• Long : ×1.5 • EX.Long : ×2

날경	20이하	30이하	40이하	50이하
2날	3,700	4,900	8,500	14,600
4날	4,900	6,100	9,700	18,200

• 골수리(홈연삭) : X1.5

HSS Roughing 엔드밀

• Long : ×1.5 • EX.Long : ×2

날경	20이하	30이하	40이하	50이하
-	4,900	6,100	8,500	10,900

HITACHI Ball & Radius 인서트

R X D	R6 X12,13	R8 X16,17	R10 X20,21	R12.5X25,26	R15 X30
무코팅	6,600	7,700	8,800	9,900	13,200
TIALN코팅	11,000	13,200	14,300	15,400	18,700

초경 드릴 재연마

오일홀 타입 ×1.8

날경		6이하	10이하	12이하	16이하	20이하
무코팅	2날	5,500	6,000	7,000	9,000	12,000
TIALN코팅	2날	7,500	8,500	10,000	12,000	17,000