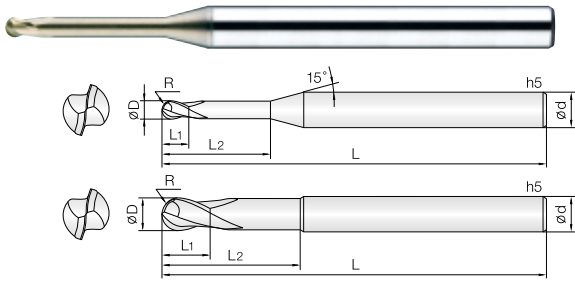


2HRBG 2 Flutes Rib Ball End Mills for Multi Purpose

2날 범용 리브 볼 엔드밀



- 중저경도강(HRc52이하), 프리하드강 계열, 탄소강, 금형강 등 다양한 피삭재 가공
- JCRO 코팅 처리하여 넓은 영역의 피삭재 가공에 적합합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 항절력이 높은 미립자 초경합금(0.5µm)을 채택, 엔드밀의 파손을 최소화 하였습니다.

• Endmills for various work materials (~HRc52), pre-hardened steels, carbon steels, mold steels

- Optimum for various work materials by JCRO coating.
- High precise edge tolerance.
- Minimize fracturing by high TRS fine(0.5µm) WC grade.



0.05 ~ 2.5R 3 ~ 6R 449P

Condition	D Size	D Tolerance	Condition	D Size	D Tolerance
ØD ≠ Ød	Ø0.1	+0 ~ -0.005mm	ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm
	Ø0.2 ~ 12	+0 ~ -0.01mm			

단위 : mm

Order Number	날경 Diameter R x D	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샤프트 Shank Dia d	비고	Order Number	날경 Diameter R x D	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샤프트 Shank Dia d	비고
2HRBG 001 003 S04	0.05R X 0.1	0.15	0.3	40	4		2HRBG 008 100 S04	0.4R X 0.8	0.9	10	45	4	
2HRBG 001 005 S04	0.05R X 0.1	0.15	0.5	40	4		2HRBG 008 120 S04	0.4R X 0.8	0.9	12	45	4	
2HRBG 002 005 S04	0.1R X 0.2	0.2	0.5	40	4		2HRBG 008 140 S04	0.4R X 0.8	0.9	14	45	4	
2HRBG 002 010 S04	0.1R X 0.2	0.2	1	40	4		2HRBG 008 160 S04	0.4R X 0.8	0.9	16	45	4	
2HRBG 002 015 S04	0.1R X 0.2	0.2	1.5	40	4		2HRBG 009 040 S04	0.45R X 0.9	1	4	45	4	
2HRBG 002 020 S04	0.1R X 0.2	0.2	2	40	4		2HRBG 010 020 S04	0.5R X 1	1.2	2	45	4	
2HRBG 003 010 S04	0.15R X 0.3	0.3	1	40	4		2HRBG 010 020 S06	0.5R X 1	1.2	2	45	6	
2HRBG 003 015 S04	0.15R X 0.3	0.3	1.5	40	4		2HRBG 010 030 S04	0.5R X 1	1.2	3	45	4	
2HRBG 003 020 S04	0.15R X 0.3	0.3	2	40	4		2HRBG 010 030 S06	0.5R X 1	1.2	3	45	6	
2HRBG 003 030 S04	0.15R X 0.3	0.3	3	40	4		2HRBG 010 040 S04	0.5R X 1	1.2	4	45	4	
2HRBG 003 040 S04	0.15R X 0.3	0.3	4	40	4		2HRBG 010 040 S06	0.5R X 1	1.2	4	45	6	
2HRBG 003 050 S04	0.15R X 0.3	0.3	5	40	4		2HRBG 010 050 S04	0.5R X 1	1.2	5	45	4	
2HRBG 004 010 S04	0.2R X 0.4	0.5	1	40	4		2HRBG 010 050 S06	0.5R X 1	1.2	5	45	6	
2HRBG 004 020 S04	0.2R X 0.4	0.5	2	40	4		2HRBG 010 060 S04	0.5R X 1	1.2	6	45	4	
2HRBG 004 030 S04	0.2R X 0.4	0.5	3	40	4		2HRBG 010 060 S06	0.5R X 1	1.2	6	45	6	
2HRBG 004040 S04	0.2R X 0.4	0.5	4	40	4		2HRBG 010 080 S04	0.5R X 1	1.2	8	45	4	
2HRBG 004 050 S04	0.2R X 0.4	0.5	5	40	4		2HRBG 010 080 S06	0.5R X 1	1.2	8	45	6	
2HRBG 004 060 S04	0.2R X 0.4	0.5	6	40	4		2HRBG 010 100 S04	0.5R X 1	1.2	10	50	4	
2HRBG 004 080 S04	0.2R X 0.4	0.5	8	40	4		2HRBG 010 100 S06	0.5R X 1	1.2	10	50	6	
2HRBG 004 100 S04	0.2R X 0.4	0.5	10	40	4		2HRBG 010 120 S04	0.5R X 1	1.2	12	50	4	
2HRBG 005 010 S04	0.25R X 0.5	0.6	1	45	4		2HRBG 010 120 S06	0.5R X 1	1.2	12	50	6	
2HRBG 005 020 S04	0.25R X 0.5	0.6	2	45	4		2HRBG 010 140 S04	0.5R X 1	1.2	14	50	4	
2HRBG 005 030 S04	0.25R X 0.5	0.6	3	45	4		2HRBG 010 140 S06	0.5R X 1	1.2	14	50	6	
2HRBG 005 040 S04	0.25R X 0.5	0.6	4	45	4		2HRBG 010 160 S04	0.5R X 1	1.2	16	50	4	
2HRBG 005 050 S04	0.25R X 0.5	0.6	5	45	4		2HRBG 010 160 S06	0.5R X 1	1.2	16	55	6	
2HRBG 005 060 S04	0.25R X 0.5	0.6	6	45	4		2HRBG 010 180 S04	0.5R X 1	1.2	18	50	4	
2HRBG 005 080 S04	0.25R X 0.5	0.6	8	45	4		2HRBG 010 180 S06	0.5R X 1	1.2	18	60	6	
2HRBG 005 100 S04	0.25R X 0.5	0.6	10	45	4		2HRBG 010 200 S04	0.5R X 1	1.2	20	50	4	
2HRBG 005 120 S04	0.25R X 0.5	0.6	12	45	4		2HRBG 010 200 S06	0.5R X 1	1.2	20	60	6	
2HRBG 005 140 S04	0.25R X 0.5	0.6	14	45	4		2HRBG 010 220 S04	0.5R X 1	1.2	22	60	4	
2HRBG 006 010 S04	0.3R X 0.6	0.7	1	45	4		2HRBG 010 220 S06	0.5R X 1	1.2	22	65	6	
2HRBG 006 020 S04	0.3R X 0.6	0.7	2	45	4		2HRBG 010 250 S04	0.5R X 1	1.2	25	60	4	
2HRBG 006 030 S04	0.3R X 0.6	0.7	3	45	4		2HRBG 012 040 S04	0.6R X 1.2	1.4	4	45	4	
2HRBG 006 040 S04	0.3R X 0.6	0.7	4	45	4		2HRBG 012 040 S06	0.6R X 1.2	1.4	4	45	6	
2HRBG 006 050 S04	0.3R X 0.6	0.7	5	45	4		2HRBG 012 060 S04	0.6R X 1.2	1.4	6	45	4	
2HRBG 006 060 S04	0.3R X 0.6	0.7	6	45	4		2HRBG 012 060 S06	0.6R X 1.2	1.4	6	45	6	
2HRBG 006 080 S04	0.3R X 0.6	0.7	8	45	4		2HRBG 012 080 S04	0.6R X 1.2	1.4	8	45	4	
2HRBG 006 100 S04	0.3R X 0.6	0.7	10	45	4		2HRBG 012 080 S06	0.6R X 1.2	1.4	8	45	6	
2HRBG 006 120 S04	0.3R X 0.6	0.7	12	45	4		2HRBG 012 100 S04	0.6R X 1.2	1.4	10	50	4	
2HRBG 006 140 S04	0.3R X 0.6	0.7	14	45	4		2HRBG 012 100 S06	0.6R X 1.2	1.4	10	50	6	
2HRBG 006 160 S04	0.3R X 0.6	0.7	16	45	4		2HRBG 012 120 S04	0.6R X 1.2	1.4	12	50	4	
2HRBG 007 020 S04	0.35R X 0.7	0.8	2	45	4		2HRBG 012 120 S06	0.6R X 1.2	1.4	12	50	6	
2HRBG 007 040 S04	0.35R X 0.7	0.8	4	45	4		2HRBG 012 160 S04	0.6R X 1.2	1.4	16	50	4	
2HRBG 007 080 S04	0.35R X 0.7	0.8	8	45	4		2HRBG 012 160 S06	0.6R X 1.2	1.4	16	55	6	
2HRBG 007 100 S04	0.35R X 0.7	0.8	10	45	4		2HRBG 012 200 S04	0.6R X 1.2	1.4	20	50	4	
2HRBG 007 120 S04	0.35R X 0.7	0.8	12	45	4		2HRBG 012 200 S06	0.6R X 1.2	1.4	20	60	6	
2HRBG 008 020 S04	0.4R X 0.8	0.9	2	45	4		2HRBG 012 240 S04	0.6R X 1.2	1.4	24	60	4	
2HRBG 008 040 S04	0.4R X 0.8	0.9	4	45	4		2HRBG 012 240 S06	0.6R X 1.2	1.4	24	65	6	
2HRBG 008 060 S04	0.4R X 0.8	0.9	6	45	4		2HRBG 014 060 S04	0.7R X 1.4	1.6	6	45	4	
2HRBG 008 080 S04	0.4R X 0.8	0.9	8	45	4		2HRBG 014 080 S04	0.7R X 1.4	1.6	8	45	4	

G series

단위 : mm

Order Number	날경 Diameter D×R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고	Order Number	날경 Diameter D×R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2HRBG 014 120 S04	0.7R X 1.4	1.6	12	50	4		2HRBG 020 350 S06	1R X 2	2.4	35	75	6	
2HRBG 014 160 S04	0.7R X 1.4	1.6	16	50	4		2HRBG 020 400 S04	1R X 2	2.4	40	80	4	
2HRBG 015 030 S04	0.75R X 1.5	1.8	3	45	4		2HRBG 020 400 S06	1R X 2	2.4	40	80	6	
2HRBG 015 030 S06	0.75R X 1.5	1.8	3	45	6		2HRBG 020 450 S04	1R X 2	2.4	45	80	4	
2HRBG 015 040 S04	0.75R X 1.5	1.8	4	45	4		2HRBG 025 080 S04	1.25R X 2.5	3	8	45	4	
2HRBG 015 040 S06	0.75R X 1.5	1.8	4	45	6		2HRBG 025 100 S04	1.25R X 2.5	3	10	50	4	
2HRBG 015 060 S04	0.75R X 1.5	1.8	6	45	4		2HRBG 025 160 S04	1.25R X 2.5	3	16	50	4	
2HRBG 015 060 S06	0.75R X 1.5	1.8	6	45	6		2HRBG 025 200 S04	1.25R X 2.5	3	20	50	4	
2HRBG 015 080 S04	0.75R X 1.5	1.8	8	45	4		2HRBG 025 250 S04	1.25R X 2.5	3	25	60	4	
2HRBG 015 080 S06	0.75R X 1.5	1.8	8	45	6		2HRBG 025 300 S04	1.25R X 2.5	3	30	70	4	
2HRBG 015 100 S04	0.75R X 1.5	1.8	10	50	4		2HRBG 025 350 S04	1.25R X 2.5	3	35	70	4	
2HRBG 015 100 S06	0.75R X 1.5	1.8	10	50	6		2HRBG 030 060 S06	1.5R X 3	3.6	6	45	6	
2HRBG 015 120 S04	0.75R X 1.5	1.8	12	50	4		2HRBG 030 080 S06	1.5R X 3	3.6	8	45	6	
2HRBG 015 120 S06	0.75R X 1.5	1.8	12	50	6		2HRBG 030 100 S06	1.5R X 3	3.6	10	50	6	
2HRBG 015 140 S04	0.75R X 1.5	1.8	14	50	4		2HRBG 030 120 S06	1.5R X 3	3.6	12	50	6	
2HRBG 015 140 S06	0.75R X 1.5	1.8	14	50	6		2HRBG 030 160 S06	1.5R X 3	3.6	16	55	6	
2HRBG 015 160 S04	0.75R X 1.5	1.8	16	50	4		2HRBG 030 200 S06	1.5R X 3	3.6	20	60	6	
2HRBG 015 160 S06	0.75R X 1.5	1.8	16	55	6		2HRBG 030 250 S06	1.5R X 3	3.6	25	65	6	
2HRBG 015 180 S04	0.75R X 1.5	1.8	18	50	4		2HRBG 030 300 S06	1.5R X 3	3.6	30	70	6	
2HRBG 015 180 S06	0.75R X 1.5	1.8	18	60	6		2HRBG 030 350 S06	1.5R X 3	3.6	35	75	6	
2HRBG 015 200 S04	0.75R X 1.5	1.8	20	50	4		2HRBG 030 400 S06	1.5R X 3	3.6	40	80	6	
2HRBG 015 200 S06	0.75R X 1.5	1.8	20	60	6		2HRBG 030 450 S06	1.5R X 3	3.6	45	90	6	
2HRBG 015 220 S04	0.75R X 1.5	1.8	22	60	4		2HRBG 030 500 S06	1.5R X 3	3.6	50	100	6	
2HRBG 015 220 S06	0.75R X 1.5	1.8	22	65	6		2HRBG 030 600 S06	1.5R X 3	3.6	60	100	6	
2HRBG 015 250 S04	0.75R X 1.5	1.8	25	60	4		2HRBG 040 080 S06	2R X 4	4.8	8	45	6	
2HRBG 015 250 S06	0.75R X 1.5	1.8	25	65	6		2HRBG 040 100 S06	2R X 4	4.8	10	50	6	
2HRBG 015 300 S04	0.75R X 1.5	1.8	30	70	4		2HRBG 040 120 S06	2R X 4	4.8	12	50	6	
2HRBG 015 300 S06	0.75R X 1.5	1.8	30	70	6		2HRBG 040 160 S06	2R X 4	4.8	16	55	6	
2HRBG 015 350 S04	0.75R X 1.5	1.8	35	70	4		2HRBG 040 200 S06	2R X 4	4.8	20	60	6	
2HRBG 016 060 S04	0.8R X 1.6	1.9	6	45	4		2HRBG 040 250 S06	2R X 4	4.8	25	65	6	
2HRBG 016 080 S04	0.8R X 1.6	1.9	8	45	4		2HRBG 040 300 S06	2R X 4	4.8	30	70	6	
2HRBG 016 120 S04	0.8R X 1.6	1.9	12	50	4		2HRBG 040 350 S06	2R X 4	4.8	35	75	6	
2HRBG 016 160 S04	0.8R X 1.6	1.9	16	50	4		2HRBG 040 400 S06	2R X 4	4.8	40	80	6	
2HRBG 016 200 S04	0.8R X 1.6	1.9	20	50	4		2HRBG 040 450 S06	2R X 4	4.8	45	90	6	
2HRBG 018 060 S04	0.9R X 1.8	2.1	6	45	4		2HRBG 040 500 S06	2R X 4	4.8	50	100	6	
2HRBG 018 080 S04	0.9R X 1.8	2.1	8	45	4		2HRBG 040 550 S06	2R X 4	4.8	55	100	6	
2HRBG 018 120 S04	0.9R X 1.8	2.1	12	50	4		2HRBG 040 600 S06	2R X 4	4.8	60	100	6	
2HRBG 018 160 S04	0.9R X 1.8	2.1	16	50	4		2HRBG 050 150 S06	2.5R X 5	6	15	55	6	
2HRBG 018 200 S04	0.9R X 1.8	2.1	20	50	4		2HRBG 050 200 S06	2.5R X 5	6	20	60	6	
2HRBG 020 040 S04	1R X 2	2.4	4	45	4		2HRBG 050 250 S06	2.5R X 5	6	25	70	6	
2HRBG 020 040 S06	1R X 2	2.4	4	45	6		2HRBG 050 300 S06	2.5R X 5	6	30	75	6	
2HRBG 020 060 S04	1R X 2	2.4	6	45	4		2HRBG 050 400 S06	2.5R X 5	6	40	80	6	
2HRBG 020 060 S06	1R X 2	2.4	6	45	6		2HRBG 050 450 S06	2.5R X 5	6	45	90	6	
2HRBG 020 080 S04	1R X 2	2.4	8	45	4		2HRBG 050 500 S06	2.5R X 5	6	50	100	6	
2HRBG 020 080 S06	1R X 2	2.4	8	45	6		2HRBG 050 600 S06	2.5R X 5	6	60	100	6	
2HRBG 020 100 S04	1R X 2	2.4	10	50	4		2HRBG 060 150 S06	3R X 6	10	15	55	6	
2HRBG 020 100 S06	1R X 2	2.4	10	50	6		2HRBG 060 300 S06	3R X 6	10	30	110	6	
2HRBG 020 120 S04	1R X 2	2.4	12	50	4		2HRBG 080 250 060	4R X 8	12	25	60	8	
2HRBG 020 120 S06	1R X 2	2.4	12	50	6		2HRBG 080 300 100	4R X 8	12	30	100	8	
2HRBG 020 140 S04	1R X 2	2.4	14	50	4		2HRBG 100 300 070	5R X 10	16	30	70	10	
2HRBG 020 140 S06	1R X 2	2.4	14	50	6		2HRBG 100 350 100	5R X 10	16	35	100	10	
2HRBG 020 160 S04	1R X 2	2.4	16	50	4		2HRBG 120 300 075	6R X 12	18	30	75	12	
2HRBG 020 160 S06	1R X 2	2.4	16	60	6		2HRBG 120 400 110	6R X 12	18	40	110	12	
2HRBG 020 180 S04	1R X 2	2.4	18	50	4								
2HRBG 020 180 S06	1R X 2	2.4	18	60	6								
2HRBG 020 200 S04	1R X 2	2.4	20	50	4								
2HRBG 020 200 S06	1R X 2	2.4	20	60	6								
2HRBG 020 220 S04	1R X 2	2.4	22	60	4								
2HRBG 020 220 S06	1R X 2	2.4	22	65	6								
2HRBG 020 250 S04	1R X 2	2.4	25	60	4								
2HRBG 020 250 S06	1R X 2	2.4	25	65	6								
2HRBG 020 300 S04	1R X 2	2.4	30	70	4								
2HRBG 020 300 S06	1R X 2	2.4	30	70	6								
2HRBG 020 350 S04	1R X 2	2.4	35	70	4								

피삭재 Material		동 Copper alloys C1100				합금강 / 프리하드강 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
R0.1	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
R0.15	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
	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
R0.2	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
	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
R0.25	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
	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
R0.3	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
R0.35	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
	8	32,000	800	0.019	0.072	25,000	420	0.020	0.048	22,500	355	0.012	0.048
R0.4	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
	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
R0.45	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
	2	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
R0.5	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
	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	

피삭재 Material		동 합금 Copper alloys C1100				합금강 / 프리하드강 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
R0.6	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	0.007	0.040	
R0.7	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
R0.75	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	
35	10,700	410	0.019	0.090	9,000	380	0.016	0.060	11,000	390	0.012	0.060	
R0.8	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
	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
R0.9	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
	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
R1	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	
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	
R1.25	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
35	6,900	770	0.018	0.050	8,400	540	0.015	0.030	8,400	560	0.011	0.030	
R1.5	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	0.290	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	

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
R1.5	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	0.100	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
	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
R2.5	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
	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
R5	30	7,700	1,500	0.450	1.200	7,200	925	0.380	0.800	4,500	580	0.300	0.800
	30	7,800	1,300	0.300	0.900	6,800	900	0.230	0.600	4,600	570	0.190	0.570
R6	35	7,125	1,292	0.176	0.513	6,800	860	0.140	0.340	5,700	665	0.110	0.340
	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 낮춰주세요.
- 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 시켜주세요.
- 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 5µm 이내 일것.)
- 원활한 칩배출을 위하여 에어브로 혹은 미스트 콜러트 사용을 추천하며, 동 가공시 습식 콜러트를 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 5µm).
- Air blow or oil mist is recommended for smooth chip emission, and wet coolant milling is recommended for copper material.