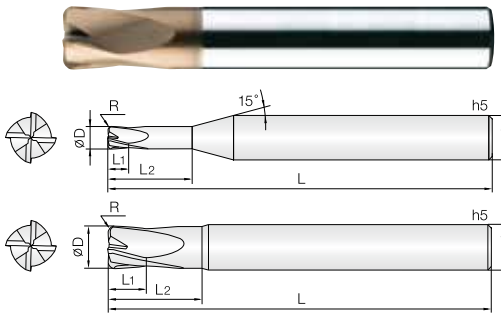
4RCU

4 Flutes High Speed Corner Radius Cutters

4날 고이송 코너 레디우스 커터



- 고경도강(HRc50~62), 프리하든강 계열의 고정밀 가공 엔드밀
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 저속 RPM에서 고이송 작업이 가능하도록 설계하였습니다.
- 중삭 및 황삭 가공시 작업 효율이 극대화 됩니다.
- 항절력이 높은 미립자 초경합금을 채택하여, 고이송 작업시 엔드밀의 파손을 최소화 하였습니다.

- Endmills for pre-hardened and hardened steels(HRc50~62)
- Good wear resistance by Si-based PVD coating.
- Designed for low speed with high feed condition.
- Suitable for heavy duty and roughing application.
- Minimize fracturing at high feed by high TRS fine WC grade.

4 | WC 미립자 | TISIN Coating | R ± 0.005 R0.2 ~ 0.5 | R ± 0.01 R1 ~ 1.5 | R ± 0.015 R2 ~ 3 | 15° Helix Angle | CUTTING DATA 437P

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 16	+0 ~ -0.01mm

Condition	D Size	D Tolerance
ØD = Ød	Ø6 ~ 12	-0.005 ~ -0.015mm
	Ø16	-0.01 ~ -0.02mm

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
4RCU 010 002 025	1 X R0.2	1	2.5	50	4	
4RCU 015 005 040	1.5 X R0.5	1.5	4	50	4	
4RCU 020 005 060	2 X R0.5	2	6	50	6	
4RCU 030 005 080	3 X R0.5	3	8	50	6	
4RCU 040 005 120	4 X R0.5	4	12	60	6	
4RCU 040 005 160	4 X R0.5	4	16	60	6	
4RCU 040 010 120	4 X R1	4	12	60	6	
4RCU 040 010 160	4 X R1	4	16	60	6	
4RCU 050 005 150	5 X R0.5	5	15	60	6	
4RCU 050 010 150	5 X R1	5	15	60	6	
4RCU 060 003 150	6 X R0.3	6	15	60	6	
4RCU 060 005 150	6 X R0.5	6	15	60	6	
4RCU 060 010 150	6 X R1	6	15	60	6	
4RCU 060 015 150	6 X R1.5	6	15	60	6	
New 4RCU 060 020 150	6 X R2	6	15	60	6	
New 4RCU 060 025 150	6 X R2.5	6	15	60	6	
4RCU 080 003 160	8 X R0.3	8	16	60	8	
4RCU 080 005 160	8 X R0.5	8	16	60	8	
4RCU 080 005 200	8 X R0.5	8	20	80	8	
4RCU 080 005 300	8 X R0.5	8	30	110	8	
4RCU 080 010 160	8 X R1	8	16	60	8	
4RCU 080 010 200	8 X R1	8	20	80	8	
4RCU 080 010 300	8 X R1	8	30	110	8	
4RCU 080 020 160	8 X R2	8	16	60	8	
4RCU 080 020 200	8 X R2	8	20	80	8	
4RCU 080 020 300	8 X R2	8	30	110	8	
New 4RCU 080 030 160	8 X R3	8	16	60	8	
New 4RCU 080 030 200	8 X R3	8	20	80	8	
New 4RCU 080 030 300	8 X R3	8	30	110	8	
4RCU 100 003 200	10 X R0.3	10	20	70	10	
4RCU 100 005 200	10 X R0.5	10	20	70	10	
4RCU 100 005 250	10 X R0.5	10	25	90	10	
4RCU 100 005 300	10 X R0.5	10	30	120	10	
4RCU 100 010 200	10 X R1	10	20	70	10	
4RCU 100 010 250	10 X R1	10	25	90	10	
4RCU 100 010 300	10 X R1	10	30	120	10	
4RCU 100 020 200	10 X R2	10	20	70	10	
4RCU 100 020 250	10 X R2	10	25	90	10	
4RCU 100 020 300	10 X R2	10	30	120	10	
New 4RCU 100 030 200	10 X R3	10	20	70	10	
New 4RCU 100 030 250	10 X R3	10	25	90	10	
New 4RCU 100 030 300	10 X R3	10	30	120	10	
4RCU 120 005 250	12 X R0.5	12	25	80	12	
4RCU 120 005 300	12 X R0.5	12	30	100	12	
4RCU 120 005 350	12 X R0.5	12	35	130	12	
4RCU 120 010 250	12 X R1	12	25	80	12	
4RCU 120 010 300	12 X R1	12	30	100	12	
4RCU 120 010 350	12 X R1	12	35	130	12	
4RCU 120 020 250	12 X R2	12	25	80	12	
4RCU 120 020 300	12 X R2	12	30	100	12	

Order Number	날경 Diameter D×R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
4RCU 120 020 350	12 X R2	12	35	130	12	
4RCU 120 030 250	12 X R3	12	25	80	12	
New 4RCU 120 030 300	12 X R3	12	30	100	12	
New 4RCU 120 030 350	12 X R3	12	35	130	12	
New 4RCU 120 040 250	12 X R4	12	25	80	12	
New 4RCU 120 040 300	12 X R4	12	30	100	12	
New 4RCU 120 040 350	12 X R4	12	35	130	12	
4RCU 160 010 300	16 X R1	16	30	110	16	
4RCU 160 010 400	16 X R1	16	40	160	16	
4RCU 160 020 300	16 X R2	16	30	110	16	
4RCU 160 020 400	16 X R2	16	40	160	16	
New 4RCU 160 030 300	16 X R3	16	30	110	16	
New 4RCU 160 030 400	16 X R3	16	40	160	16	
New 4RCU 160 040 300	16 X R4	16	30	110	16	
New 4RCU 160 040 400	16 X R4	16	40	160	16	
New 4RCU 160 050 300	16 X R5	16	30	110	16	
New 4RCU 160 050 400	16 X R5	16	40	160	16	

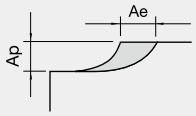
4RCU/6RCU

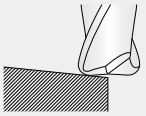
■ 6RCU은 RPM 동일, FEED만 최대 **30% Up** 적용.
■ Use the same RPM and raise up the feed up to 30% for 6RCU.

• 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.