

• 고경도강(HRc50~62), 프리하든강 계열의 고속 가공 엔드밀

- 실리코계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 날부인선의 조도가 뛰어나 피삭재의 면조도가 우수합니다.
- 초미립자 초경합금 (0.2 μ m)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

• Endmills for pre-hardened and hardened steel(HRc50~62)

- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Very nice work surface finish.
- Outstanding performance at high speed machining by ultra fine (0.2 μ m) WC grade.



0.03 ~ 2.9R 3 ~ 6R 6.5 ~ 10R 301P

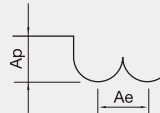
D Size	D Tolerance
Ø 0.06 ~ 0.19	+0 ~ -0.005mm
Ø 0.2 ~ 5.8	+0 ~ -0.01mm
Ø 6 ~ 12	-0.005 ~ -0.015mm
Ø 13 ~ 20	-0.01 ~ -0.02mm

단위: mm

Order Number	날경 Diameter R × D	날장 Length of cut L1	전장 Overall Length L	샙크 Shank Dia d	비고	Order Number	날경 Diameter R × D	날장 Length of cut L1	전장 Overall Length L	샙크 Shank Dia d	비고
2HCB 0006 001 S04	0.03R X 0.06	0.1	40	4		2HCB 030 080 100	1.5R X 3	8	100	6	
2HCB 0007 0012 S04	0.035R X 0.07	0.12	40	4		2HCB 032 080 S04	1.6R X 3.2	8	60	4	
2HCB 0008 0015 S04	0.04R X 0.08	0.15	40	4		2HCB 034 080 S04	1.7R X 3.4	8	60	4	
2HCB 0009 0017 S04	0.045R X 0.09	0.17	40	4		2HCB 035 080 S06	1.75R X 3.5	8	60	6	
2HCB 001 002 S04	0.05R X 0.1	0.2	40	4		2HCB 036 090 S04	1.8R X 3.6	9	60	4	
2HCB 0015 003 S04	0.075R X 0.15	0.3	40	4		2HCB 038 090 S04	1.9R X 3.8	9	60	4	
2HCB 002 004 S04	0.1R X 0.2	0.4	40	4		2HCB 040 080 060	2R X 4	8	60	4	
2HCB 003 006 S04	0.15R X 0.3	0.6	40	4		2HCB 040 080 080	2R X 4	8	80	4	
2HCB 004 008 S04	0.2R X 0.4	0.8	40	4		2HCB 040 080 S06	2R X 4	8	70	6	
2HCB 005 010 S04	0.25R X 0.5	1	45	4		2HCB 040 080 090	2R X 4	8	90	6	
2HCB 006 012 S04	0.3R X 0.6	1.2	45	4		2HCB 040 080 120	2R X 4	8	120	6	
2HCB 007 015 S04	0.35R X 0.7	1.5	45	4		2HCB 042 100 S06	2.1R X 4.2	10	70	6	
2HCB 008 020 S04	0.4R X 0.8	2	45	4		2HCB 044 100 S06	2.2R X 4.4	10	70	6	
2HCB 009 020 S04	0.45R X 0.9	2	45	4		2HCB 045 080 S06	2.25R X 4.5	8	70	6	
2HCB 010 025 S03	0.5R X 1	2.5	50	3		2HCB 046 100 S06	2.3R X 4.6	10	70	6	
2HCB 010 025 S04	0.5R X 1	2.5	50	4		2HCB 048 110 S06	2.4R X 4.8	11	70	6	
2HCB 010 025 S06	0.5R X 1	2.5	50	6		2HCB 050 080 S05	2.5R X 5	8	80	5	
2HCB 010 025 070	0.5R X 1	2.5	70	6		2HCB 050 100 S06	2.5R X 5	10	75	6	
2HCB 010 025 100	0.5R X 1	2.5	100	6		2HCB 052 120 S06	2.6R X 5.2	12	75	6	
2HCB 011 027 S04	0.55R X 1.1	2.7	50	4		2HCB 054 120 S06	2.7R X 5.4	12	75	6	
2HCB 012 030 S03	0.6R X 1.2	3	50	3		2HCB 055 100 S06	2.75R X 5.5	10	75	6	
2HCB 012 030 S04	0.6R X 1.2	3	50	4		2HCB 056 120 S06	2.8R X 5.6	12	75	6	
2HCB 013 032 S04	0.65R X 1.3	3.2	50	4		2HCB 058 120 S06	2.9R X 5.8	12	75	6	
2HCB 014 035 S04	0.7R X 1.4	3.5	50	4		2HCB 060 100 060	3R X 6	10	60	6	
2HCB 015 040 S03	0.75R X 1.5	4	50	3		2HCB 060 120 080	3R X 6	12	80	6	
2HCB 015 040 S04	0.75R X 1.5	4	50	4		2HCB 060 120 100	3R X 6	12	100	6	
2HCB 015 040 S06	0.75R X 1.5	4	50	6		2HCB 060 120 120	3R X 6	12	120	6	
2HCB 015 040 070	0.75R X 1.5	4	70	6		2HCB 060 120 150	3R X 6	12	150	6	
2HCB 015 040 100	0.75R X 1.5	4	100	6		2HCB 070 140 S08	3.5R X 7	14	80	8	
2HCB 016 040 S04	0.8R X 1.6	4	50	4		2HCB 080 140 090	4R X 8	14	90	8	
2HCB 017 042 S04	0.85R X 1.7	4.2	50	4		2HCB 080 140 110	4R X 8	14	110	8	
2HCB 018 045 S04	0.9R X 1.8	4.5	50	4		2HCB 080 140 150	4R X 8	14	150	8	
2HCB 019 047 S04	0.95R X 1.9	4.7	50	4		2HCB 090 160 S10	4.5R X 9	16	100	10	
2HCB 020 050 S03	1R X 2	5	50	3		2HCB 100 180 100	5R X 10	18	100	10	
2HCB 020 050 S04	1R X 2	5	50	4		2HCB 100 180 120	5R X 10	18	120	10	
2HCB 020 050 S06	1R X 2	5	50	6		2HCB 100 180 150	5R X 10	18	150	10	
2HCB 020 050 075	1R X 2	5	75	6		2HCB 100 180 180	5R X 10	18	180	10	
2HCB 020 050 100	1R X 2	5	100	6		2HCB 110 200 S12	5.5R X 11	20	110	12	
2HCB 022 055 S04	1.1R X 2.2	5.5	50	4		2HCB 120 220 110	6R X 12	22	110	12	
2HCB 024 060 S04	1.2R X 2.4	6	50	4		2HCB 120 220 130	6R X 12	22	130	12	
2HCB 025 060 S03	1.25R X 2.5	6	50	3		2HCB 120 220 150	6R X 12	22	150	12	
2HCB 025 060 S04	1.25R X 2.5	6	50	4		2HCB 120 220 200	6R X 12	22	200	12	
2HCB 025 060 S06	1.25R X 2.5	6	75	6		2HCB 130 240 S14	6.5R X 13	24	110	14	
2HCB 025 060 100	1.25R X 2.5	6	100	6		2HCB 140 240 S14	7R X 14	24	110	14	
2HCB 026 060 S04	1.3R X 2.6	6	50	4		2HCB 160 300 130	8R X 16	30	130	16	
2HCB 028 070 S04	1.4R X 2.8	7	50	4		2HCB 160 300 160	8R X 16	30	160	16	
2HCB 030 080 S03	1.5R X 3	8	60	3		2HCB 160 300 200	8R X 16	30	200	16	
2HCB 030 080 S04	1.5R X 3	8	50	4		2HCB 200 380 160	10R X 20	38	160	20	
2HCB 030 080 S06	1.5R X 3	8	60	6		2HCB 200 380 200	10R X 20	38	200	20	
2HCB 030 080 080	1.5R X 3	8	80	6							

2PHCB / 2HSB / 2HCB Cutting Condition

• RPM : rev./min • Feed : mm/min

파삭재 Material		동 Copper				프리하든강/고경도강 Prehardened Steel / Hardened Steel				고경도강 Hardened Steels				고경도강 Hardened Steels			
경도 Hardness						30 ~ 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	0.010	0.050	40,000	300	0.005	0.040	30,000	200	0.004	0.040	Cutting is not possible.			
R0.1	0.2	54,000	430	0.012	0.008	54,000	630	0.020	0.060	44,300	450	0.040	0.012	30,000	300	0.023	0.008
"	0.4	54,000	430	0.007	0.008	54,000	430	0.020	0.051	44,300	345	0.016	0.040	32,800	260	0.010	0.023
R0.15	0.3	54,000	720	0.020	0.013	54,000	750	0.030	0.090	44,300	600	0.024	0.072	32,800	450	0.015	0.042
"	0.6	54,000	720	0.012	0.013	54,000	715	0.030	0.075	44,300	575	0.024	0.060	32,800	430	0.015	0.035
R0.2	0.4	54,000	870	0.028	0.016	54,000	1,000	0.040	0.120	44,300	800	0.032	0.096	32,800	600	0.020	0.056
"	0.8	54,000	870	0.016	0.016	54,000	880	0.040	0.105	44,300	700	0.032	0.084	32,800	525	0.020	0.049
R0.25	0.5	56,000	1,250	0.035	0.022	53,000	1,250	0.050	0.150	43,500	1,000	0.040	0.120	32,200	750	0.025	0.070
"	1	56,000	1,380	0.021	0.022	50,000	1,000	0.050	0.125	41,350	800	0.040	0.100	30,600	600	0.025	0.058
R0.3	0.6	58,000	1,510	0.042	0.026	52,000	1,380	0.060	0.180	42,650	1,100	0.048	0.144	31,500	825	0.030	0.084
"	1.2	58,000	1,710	0.025	0.026	48,500	1,020	0.060	0.155	40,500	810	0.048	0.124	30,000	610	0.030	0.072
R0.4	0.8	52,000	1,870	0.056	0.036	48,000	1,500	0.080	0.240	39,500	1,200	0.064	0.192	29,250	900	0.040	0.112
"	2	52,000	1,970	0.033	0.036	45,000	1,085	0.080	0.200	37,500	870	0.064	0.160	27,800	650	0.040	0.093
R0.5	1	41,000	1,660	0.063	0.040	38,540	1,560	0.100	0.300	36,900	1,250	0.080	0.240	27,300	940	0.050	0.140
"	2.5	41,000	1,880	0.022	0.040	38,540	1,000	0.100	0.200	31,500	800	0.080	0.160	23,000	600	0.050	0.090
R0.6	3	34,000	2,120	0.072	0.051	31,960	1,550	0.120	0.360	32,800	1,250	0.096	0.288	24,400	940	0.060	0.168
R0.75	1.5	27,000	2,280	0.087	0.068	25,380	1,600	0.150	0.450	28,700	1,280	0.120	0.360	21,500	960	0.075	0.210
"	4	27,000	1,830	0.052	0.068	25,380	1,000	0.150	0.325	26,000	800	0.120	0.260	19,250	600	0.075	0.152
R1	2	32,700	3,560	0.112	0.089	30,738	1,850	0.200	0.600	24,600	1,480	0.160	0.480	18,250	1,110	0.100	0.280
"	5	32,700	2,980	0.067	0.089	30,738	1,350	0.200	0.435	22,000	1,080	0.160	0.348	16,250	810	0.100	0.203
R1.25	6	30,600	3,680	0.067	0.115	28,764	1,600	0.250	0.542	27,901	1,280	0.200	0.430	15,500	960	0.125	0.251
R1.5	3	26,100	4,400	0.197	0.171	24,534	2,520	0.300	0.957	23,798	2,050	0.240	0.766	15,500	1,530	0.150	0.447
"	8	26,100	4,110	0.100	0.171	24,534	2,350	0.300	0.765	23,798	1,880	0.240	0.612	15,500	1,410	0.150	0.357
R2	4	18,800	4,160	0.266	0.208	17,672	2,450	0.400	1.380	17,142	1,960	0.320	1.100	12,800	1,470	0.200	0.644
"	8	18,800	3,920	0.134	0.208	17,672	2,350	0.400	1.020	17,142	1,880	0.320	0.816	12,800	1,410	0.200	0.476
R2.5	5	17,300	3,980	0.215	0.240	16,262	2,560	0.500	1.660	15,774	2,050	0.400	1.330	11,000	1,530	0.250	0.770
"	10	17,300	3,660	0.180	0.240	16,262	2,300	0.500	1.275	15,774	1,840	0.400	1.020	11,000	1,380	0.250	0.595
R3	6	16,500	3,880	0.290	0.281	15,510	2,700	0.600	2.340	15,045	2,160	0.480	1.870	9,600	1,620	0.300	1.090
"	12	16,500	3,500	0.230	0.281	15,510	2,400	0.600	1.530	15,045	1,920	0.480	1.225	9,600	1,440	0.300	0.715
R4	8	11,660	4,000	0.400	0.175	10,960	2,300	0.800	3.100	10,632	1,840	0.640	2.480	7,600	1,380	0.400	1.446
"	14	11,660	3,850	0.400	0.175	10,960	2,000	0.800	2.050	10,632	1,600	0.640	1.640	7,600	1,200	0.400	0.957
R5	10	9,560	4,100	0.500	0.154	8,986	2,200	1.000	3.750	8,717	1,780	0.800	3.000	6,400	1,340	0.500	1.750
"	18	9,560	3,720	0.500	0.154	8,986	1,700	1.000	2.550	8,717	1,360	0.800	2.040	6,400	1,020	0.500	1.190
R6	12	7,100	4,000	0.600	0.159	6,674	1,850	1.200	4.420	6,474	1,480	0.960	3.540	5,450	1,110	0.600	2.060
"	22	7,100	3,250	0.600	0.159	6,674	1,600	1.200	3.050	6,474	1,280	0.960	2.440	5,450	960	0.600	1.423
R8	30	4,650	2,000	0.115	0.450	4,371	1,630	3.870	1.120	4,240	1,100	2.350	0.790	4,000	810	1.742	0.500
R10	38	3,200	2,200	0.100	0.400	3,008	1,450	4.120	1.100	2,918	1,100	2.530	0.840	3,100	800	1.866	0.520
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.

• 이 절삭 조건표는 절삭조건의 참고 수치입니다. 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 5µm이내 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 5µm).

• Air blow or oil mist is recommended for smooth chip emission, and dry milling is recommended for copper material.

당신의스페셜은우리의표준품입니다.

WWW.JJTOOLS.CO.KR

