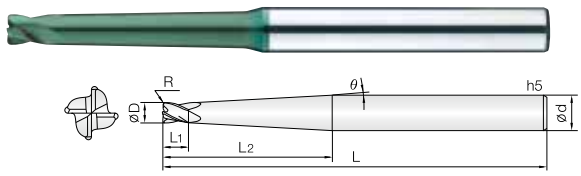
4JJTC

4 Flutes JJ Taper Neck Corner Radius End Mills for Hardened Steels

4날 고경도재 가공용 제이제이 테이퍼 넥 코너 레디우스 엔드밀



- 고경도강(HRc52~68), 프리하든강 계열의 고정밀 가공 엔드밀
- 고함량 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 유효장을 테이퍼 설계하여 깊은 홈 작업시 목부 파손 및 떨림을 최소화 하였습니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 초미립자 초경합금(0.2㎛)을채택, 고속절삭시 뛰어난 성능을 발휘합니다.

- Endmills for pre-hardened and hardened steels(HRc52~68)
- Good wear resistance by high quality Si-based PVD coating.
- Minimize chattering and fracturing by taper designed flute.
- Designed for minimizing edge chipping by corner R shape.
- High precise edge tolerance.
- Outstanding performance at high speed machining by ultra fine (0.2㎛) WC grade.

4 | UWC 초미립자 | TISIN-S Coating | R ±0.005 R0.1 ~ 0.5 | 30° Helix Angle | CUTTING DATA 416P

Condition	D Size	D Tolerance
ØD ≠ Ød	Ø1 ~ 4	+0 ~ -0.01mm

단위 : mm

Order Number	날경 Diameter D×R	각도 Angle θ	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
4JJTC 010 001 0601	1 X R0.1	1°	1	6	50	4	
4JJTC 010 001 1001	1 X R0.1	1°	1	10	50	4	
4JJTC 010 001 1501	1 X R0.1	1°	1	15	50	4	
4JJTC 010 001 2001	1 X R0.1	1°	1	20	60	4	
4JJTC 010 001 2501	1 X R0.1	1°	1	25	60	4	
4JJTC 010 001 3001	1 X R0.1	1°	1	30	70	4	
4JJTC 010 001 3501	1 X R0.1	1°	1	35	75	4	
4JJTC 010 002 0601	1 X R0.2	1°	1	6	50	4	
4JJTC 010 002 1001	1 X R0.2	1°	1	10	50	4	
4JJTC 010 002 1501	1 X R0.2	1°	1	15	50	4	
4JJTC 010 002 2001	1 X R0.2	1°	1	20	60	4	
4JJTC 010 002 2501	1 X R0.2	1°	1	25	60	4	
4JJTC 010 002 3001	1 X R0.2	1°	1	30	70	4	
4JJTC 010 002 3501	1 X R0.2	1°	1	35	75	4	
4JJTC 010 003 1001	1 X R0.3	1°	1	10	50	4	
4JJTC 010 003 1501	1 X R0.3	1°	1	15	50	4	
4JJTC 010 003 2001	1 X R0.3	1°	1	20	60	4	
4JJTC 010 003 2501	1 X R0.3	1°	1	25	60	4	
4JJTC 015 002 1001	1.5 X R0.2	1°	1.5	10	50	4	
4JJTC 015 002 1501	1.5 X R0.2	1°	1.5	15	50	4	
4JJTC 015 002 2001	1.5 X R0.2	1°	1.5	20	60	4	
4JJTC 015 002 2501	1.5 X R0.2	1°	1.5	25	60	4	
4JJTC 015 002 3001	1.5 X R0.2	1°	1.5	30	70	4	
4JJTC 015 002 3501	1.5 X R0.2	1°	1.5	35	75	4	
4JJTC 015 003 1501	1.5 X R0.3	1°	1.5	15	50	4	
4JJTC 015 003 2001	1.5 X R0.3	1°	1.5	20	60	4	
4JJTC 015 003 2501	1.5 X R0.3	1°	1.5	25	60	4	
4JJTC 015 005 1001	1.5 X R0.5	1°	1.5	10	50	4	
4JJTC 015 005 1501	1.5 X R0.5	1°	1.5	15	50	4	
4JJTC 015 005 2001	1.5 X R0.5	1°	1.5	20	60	4	
4JJTC 015 005 2501	1.5 X R0.5	1°	1.5	25	60	4	
4JJTC 015 005 3001	1.5 X R0.5	1°	1.5	30	70	4	
4JJTC 015 005 3501	1.5 X R0.5	1°	1.5	35	75	4	
4JJTC 020 002 1201	2 X R0.2	1°	2	12	50	4	
4JJTC 020 002 1601	2 X R0.2	1°	2	16	50	4	
4JJTC 020 002 2001	2 X R0.2	1°	2	20	60	4	
4JJTC 020 002 2501	2 X R0.2	1°	2	25	60	4	
4JJTC 020 002 3001	2 X R0.2	1°	2	30	70	4	
4JJTC 020 002 3501	2 X R0.2	1°	2	35	75	4	
4JJTC 020 002 4001	2 X R0.2	1°	2	40	80	4	
4JJTC 020 002 5001	2 X R0.2	1°	2	50	90	4	
4JJTC 020 003 2001	2 X R0.3	1°	2	20	60	4	
4JJTC 020 003 3001	2 X R0.3	1°	2	30	70	4	
4JJTC 020 003 4001	2 X R0.3	1°	2	40	80	4	
4JJTC 020 005 1201	2 X R0.5	1°	2	12	50	4	
4JJTC 020 005 1601	2 X R0.5	1°	2	16	50	4	
4JJTC 020 005 2001	2 X R0.5	1°	2	20	60	4	
4JJTC 020 005 2501	2 X R0.5	1°	2	25	60	4	
4JJTC 020 005 3001	2 X R0.5	1°	2	30	70	4	
4JJTC 020 005 3501	2 X R0.5	1°	2	35	75	4	

Order Number	날경 Diameter D×R	각도 Angle θ	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
4JJTC 020 005 4001	2 X R0.5	1°	2	40	80	4	
4JJTC 020 005 5001	2 X R0.5	1°	2	50	90	4	
4JJTC 030 002 2001	3 X R0.2	1°	3	20	60	6	
4JJTC 030 002 3001	3 X R0.2	1°	3	30	70	6	
4JJTC 030 002 4001	3 X R0.2	1°	3	40	80	6	
4JJTC 030 002 5001	3 X R0.2	1°	3	50	90	6	
4JJTC 030 002 6001	3 X R0.2	1°	3	60	100	6	
4JJTC 030 003 4001	3 X R0.3	1°	3	40	80	6	
4JJTC 030 003 5001	3 X R0.3	1°	3	50	90	6	
4JJTC 030 003 6001	3 X R0.3	1°	3	60	100	6	
4JJTC 030 005 2001	3 X R0.5	1°	3	20	60	6	
4JJTC 030 005 3001	3 X R0.5	1°	3	30	70	6	
4JJTC 030 005 4001	3 X R0.5	1°	3	40	80	6	
4JJTC 030 005 5001	3 X R0.5	1°	3	50	90	6	
4JJTC 030 005 6001	3 X R0.5	1°	3	60	100	6	
4JJTC 040 002 2001	4 X R0.2	1°	4	20	60	6	
4JJTC 040 002 3001	4 X R0.2	1°	4	30	70	6	
4JJTC 040 002 4001	4 X R0.2	1°	4	40	80	6	
4JJTC 040 002 5001	4 X R0.2	1°	4	50	90	6	
4JJTC 040 002 6001	4 X R0.2	1°	4	60	100	6	
4JJTC 040 003 4001	4 X R0.3	1°	4	40	80	6	
4JJTC 040 003 5001	4 X R0.3	1°	4	50	90	6	
4JJTC 040 003 6001	4 X R0.3	1°	4	60	100	6	
4JJTC 040 005 2001	4 X R0.5	1°	4	20	60	6	
4JJTC 040 005 3001	4 X R0.5	1°	4	30	70	6	
4JJTC 040 005 4001	4 X R0.5	1°	4	40	80	6	
4JJTC 040 005 5001	4 X R0.5	1°	4	50	90	6	
4JJTC 040 005 6001	4 X R0.5	1°	4	60	100	6	

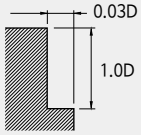
4JJCR/6JJCR/4JJTC

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

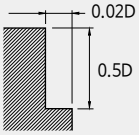
피삭재 Material		고경도강 Hardened Steels STAVAX/SKD11				열처리 / 고경도강 Heat-treated steels / Hardened Steels SKD11 / SKD61				열처리 / 고경도강 Heat-treated steels / Hardened Steels YXR7 / SKH51			
경도 Hardness		45 ~ 55HRc				55 ~ 62HRc				62~ 70HRc			
외경 Outside Diameter	반경 Corner Radius	RPM	FEED	Ap Axial Depth	Ae Radial 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

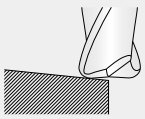
절입량 Depth of Cut

~ 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.