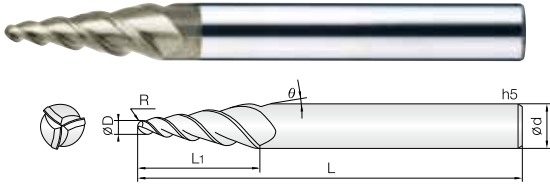




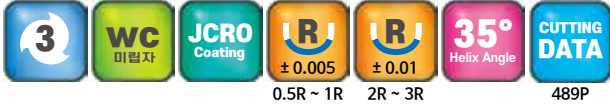
3날 임펠라 가공용 테이퍼 볼 엔드밀



- 프리하드강, 일반강, 주물, 비철합금 가공 엔드밀
- JCRO 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며, 내마모성 또한 향상됩니다.
- 공구의 교체없이 밀면과 경사면의 정삭, 황삭 가공이 동시에 가능합니다.
- 임펠라, 브리스크, 타이어 프로파일, 터빈날 등 3축과 5축의 편측각이 있는 부품 가공에 적합합니다.

• Pre-hardened steels, Cast irons, Non-metallic materials

- JCRO coating provides wear resistance improvement as well as avoid edge stress in various applications.
- Suitable for special components with 3 axes and 5 axes sector such as impellers, blisks, tire profiles, turbine blades.
- Available for simultaneous machining of roughing and finishing with only one tool.



0.5R ~ 1R 2R ~ 3R 489P

단위 : mm

Order Number	날경 Diameter R × D	각도 Angle θ	날장 Length of cut L1	전장 Overall Length L	샙크 Shank Dia d	비고	Order Number	날경 Diameter R × D	각도 Angle θ	날장 Length of cut L1	전장 Overall Length L	샙크 Shank Dia d	비고
3TBIC 010 010 120	R0.5 X 1	1°	12	50	6		3TBIC 040 040 300	R2 X 4	4°	30	75	8	
3TBIC 010 010 200	R0.5 X 1	1°	20	60	6		3TBIC 040 050 200	R2 X 4	5°	20	70	8	
3TBIC 010 020 150	R0.5 X 1	2°	15	55	6		3TBIC 040 050 320	R2 X 4	5°	32	80	10	
3TBIC 010 020 200	R0.5 X 1	2°	20	60	6		3TBIC 040 060 200	R2 X 4	6°	20	70	8	
3TBIC 010 030 150	R0.5 X 1	3°	15	55	6		3TBIC 040 060 300	R2 X 4	6°	30	80	10	
3TBIC 010 030 200	R0.5 X 1	3°	20	60	6		3TBIC 040 070 180	R2 X 4	7°	18	70	8	
3TBIC 010 040 200	R0.5 X 1	4°	20	60	6		3TBIC 040 070 260	R2 X 4	7°	26	80	10	
3TBIC 010 050 200	R0.5 X 1	5°	20	60	6		3TBIC 040 080 230	R2 X 4	8°	23	75	10	
3TBIC 010 060 200	R0.5 X 1	6°	20	60	6		3TBIC 060 010 320	R3 X 6	1°	32	75	8	
3TBIC 010 070 200	R0.5 X 1	7°	20	60	6		3TBIC 060 020 300	R3 X 6	2°	30	75	8	
3TBIC 010 080 180	R0.5 X 1	8°	18	60	6		3TBIC 060 030 220	R3 X 6	3°	22	75	8	
3TBIC 020 010 120	R1 X 2	1°	12	50	6		3TBIC 060 030 320	R3 X 6	3°	32	80	10	
3TBIC 020 010 200	R1 X 2	1°	20	60	6		3TBIC 060 030 400	R3 X 6	3°	40	90	10	
3TBIC 020 020 150	R1 X 2	2°	15	55	6		3TBIC 060 040 250	R3 X 6	4°	25	75	10	
3TBIC 020 020 200	R1 X 2	2°	20	60	6		3TBIC 060 040 310	R3 X 6	4°	31	80	10	
3TBIC 020 030 150	R1 X 2	3°	15	55	6		3TBIC 060 050 210	R3 X 6	5°	21	75	10	
3TBIC 020 030 200	R1 X 2	3°	20	60	6		3TBIC 060 050 320	R3 X 6	5°	32	80	12	
3TBIC 020 030 300	R1 X 2	3°	30	70	6		3TBIC 060 060 210	R3 X 6	6°	21	75	10	
3TBIC 020 040 200	R1 X 2	4°	20	60	6		3TBIC 060 060 310	R3 X 6	6°	31	80	12	
3TBIC 020 050 200	R1 X 2	5°	20	60	6		3TBIC 060 070 190	R3 X 6	7°	19	75	10	
3TBIC 020 050 300	R1 X 2	5°	30	75	8		3TBIC 060 070 270	R3 X 6	7°	27	80	12	
3TBIC 020 060 190	R1 X 2	6°	19	60	6								
3TBIC 020 060 290	R1 X 2	6°	29	75	8								
3TBIC 020 070 160	R1 X 2	7°	16	60	6								
3TBIC 020 070 250	R1 X 2	7°	25	70	8								
3TBIC 020 080 150	R1 X 2	8°	15	60	6								
3TBIC 020 080 220	R1 X 2	8°	22	70	8								
3TBIC 030 010 200	R1.5 X 3	1°	20	60	6								
3TBIC 030 010 320	R1.5 X 3	1°	32	75	6								
3TBIC 030 020 200	R1.5 X 3	2°	20	60	6								
3TBIC 030 030 200	R1.5 X 3	3°	20	60	6								
3TBIC 030 030 300	R1.5 X 3	3°	30	70	6								
3TBIC 030 030 390	R1.5 X 3	3°	39	80	8								
3TBIC 030 040 200	R1.5 X 3	4°	20	65	6								
3TBIC 030 050 180	R1.5 X 3	5°	18	60	6								
3TBIC 030 050 300	R1.5 X 3	5°	30	75	8								
3TBIC 030 060 150	R1.5 X 3	6°	15	60	6								
3TBIC 030 060 250	R1.5 X 3	6°	25	70	8								
3TBIC 030 070 190	R1.5 X 3	7°	19	70	8								
3TBIC 030 070 300	R1.5 X 3	7°	30	80	10								
3TBIC 030 080 190	R1.5 X 3	8°	19	70	8								
3TBIC 030 080 260	R1.5 X 3	8°	26	75	10								
3TBIC 040 010 200	R2 X 4	1°	20	60	6								
3TBIC 040 010 320	R2 X 4	1°	32	75	6								
3TBIC 040 020 200	R2 X 4	2°	20	60	6								
3TBIC 040 020 300	R2 X 4	2°	30	70	6								
3TBIC 040 030 210	R2 X 4	3°	21	70	6								
3TBIC 040 030 320	R2 X 4	3°	32	80	8								
3TBIC 040 030 400	R2 X 4	3°	40	90	8								
3TBIC 040 040 200	R2 X 4	4°	20	70	8								

TAPER

피삭재 Material			합금강/프리하드강 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.