Made in Korea

SPEED-1

Ver. 2017

초경 엔드밀
SOLID CARBIDE
END MILLS

초고경도용 For Super Hardened Steels

고경도용 For Hardened Steels

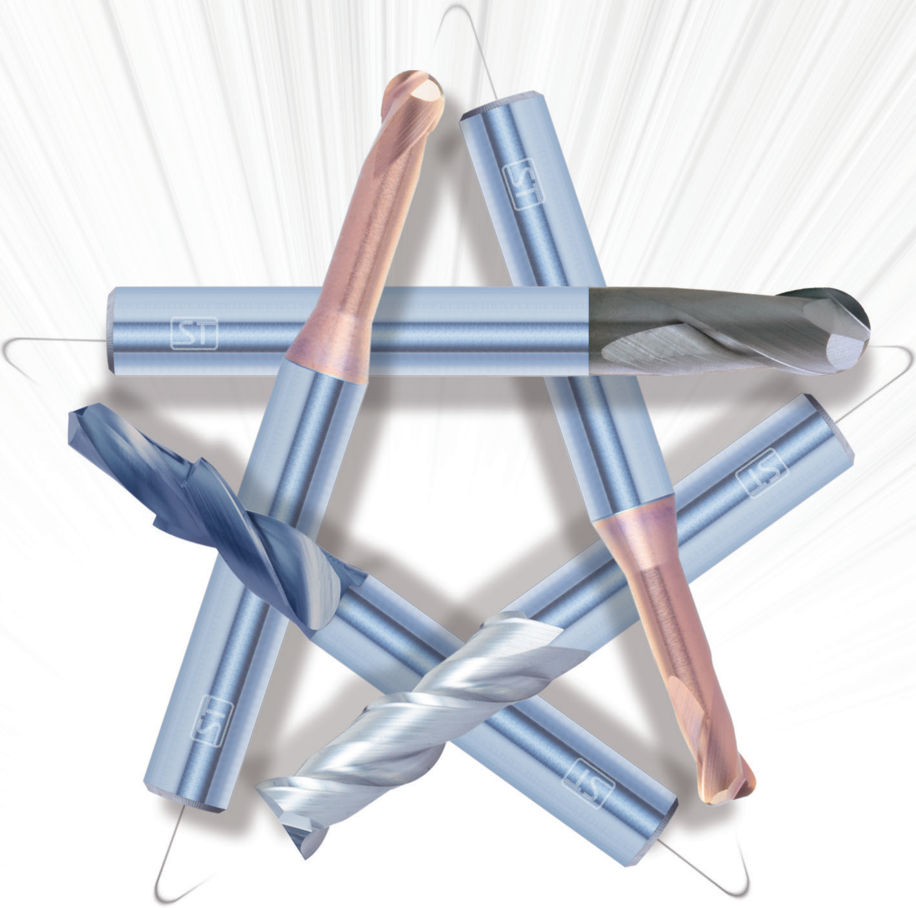
이코노믹 시리즈 Economic Series

기타(Al, Cu, Sus...) For Others

흑연용 For Graphite

범용 Special

스페셜 엔드밀 Specials-Custom Made



스타공구(주)
STAR TOOL CO., LTD.

Venture for Tomorrow
Korean Venture Entrepreneurship

ISO 9001

INNOBIZ
기술혁신형중소기업

목차–용도별 Index-By Use

용도 Use	날 수 # of Flutes	날 형상 End Feature	제품코드 Code Name	명 칭 Tool Description	코팅 Coating	페이지 Page
이코노믹 시리즈 Economic Series	2F	볼 Ball End	2BRE	 2날 볼–이코노믹 2F Ball End-Economic	AlTiCrSiN	96
		평 Square End	2SRE	 2날 평–이코노믹 2F Square End-Economic	AlTiCrSiN	98
	4F	평 Square End	4SRE	 4날 평–이코노믹 4F Square End-Economic	AlTiCrSiN	100
	2F	평 Square End	2SLE	 2날 평 롱–이코노믹 2F Square End-Long-Economic	AlTiCrSiN	101
	4F	평 Square End	4SLE	 4날 평 롱–이코노믹 4F Square End-Long-Economic	AlTiCrSiN	102
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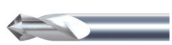
	4F	코너 R Corner Radius	4CLE	 4날 코너 R 롱–이코노믹 4F Corner Radius-Long-Economic	AlTiCrSiN	105
		볼 Ball End	4RBM	 4날 볼 헤드 체인지 엔드밀 4F Replaceable Modular Ball Nose Endmill	AlTiCrSiN	107
		평 Square End	4RSM	 4날 평 헤드 체인지 엔드밀 4F Replaceable Modular Square Endmill	AlTiCrSiN	108
		코너 R Corner Radius	4RCM	 4날 코너 R 헤드 체인지 엔드밀 4F Replaceable Modular Corner "R" Endmill	AlTiCrSiN	109
기타 (Al, Cu, Sus...) For Others	2F	평 Square End	2SA	 2날 평–알루미늄 가공용 2F Square End for Aluminum	Uncoated	112
	3F	평 Square End	3SA	 3날 평–알루미늄 가공용 3F Square End for Aluminum	Uncoated	113
		코너 R Corner Radius	3CA	 3날 코너 R–알루미늄 가공용 3F Corner Radius End for Aluminum	Uncoated	115
	2F	코너 R Corner Radius	2CC	 2날 코너 R–동 가공용 2F Corner Radius for Copper	AlTiN	116
		볼 Ball End	2BY	 2날 볼–수지 비철 가공용 2F Ball End for Synthetic Materials	Uncoated	117
		평 Square End	2SY	 2날 평–수지 비철 가공용 2F Square End for Synthetic Materials	Uncoated	119
	4F	평 Square End	4SS	 4날 평–SUS 4F Square for Stainless Steel	AlTiN	121
		코너 R Corner Radius	4CS	 4날 코너 R–SUS 4F Corner Radius for Stainless Steel	AlTiN	122
흑연용 For Graphite	2F	볼 Ball End	2BG	 2날 볼–흑연 가공용 2F Ball End for Graphite	AlTiN	124
		평 Square End	2SG	 2날 평–흑연 가공용 2F Square End for Graphite	AlTiN	126
		볼 Ball End	2BD	 2날 볼–다이아몬드 코팅 2F Ball End-Diamond Coated	Diamond	127
	4F	볼 Ball End	4BD	 4날 볼–다이아몬드 코팅 4F Ball End-Diamond Coated	Diamond	130
범용 Special	1F	평 Square End	1FE	 1날 엔드밀 1F End Mill	Uncoated	134
	2F	–	2CE	 2날 센터링 2F Centering	Uncoated	135
		–	2NCD	 2날 NC 드릴 2F NC Drill	Uncoated	136
		–	2CRR	 2날 역 R 2F Corner Rounding R	Uncoated	137

목차–용도별 Index-By Use

아이콘 가이드

Icon Glossary

구 분 Type	설 명 Description				
엔드밀 소재 Tool substrate	M/G Carbide				
	초미립 초경합금 Micrograin carbide				
헬릭스 각 Helix angle	HX15°	HX20°	HX30°	HX40°	HX45°
	15°	20°	30°	40°	45°
날 수 Number of cutting edges	1	2	3	4	6
	1날 1 Flute	2날 2 Flutes	3날 3 Flutes	4날 4 Flutes	6날 6 Flutes
코 팅 Coating	AlTiSiN Coated	S-HC Coated	AlTiN Coated	Diamond Coated	Uncoated
	AlTiN/SiN 나노 컴포지트 코팅 Nanocomposite coating	나노 컴포지트 코팅 (초고경도용) Nanocomposite coating for Super hardened steels	AlTiN 코팅 AlTiN coated	다이아몬드 코팅 Diamond coated	코팅 없음 Uncoated
	AlTiCrSiN Coated				
	AlTiCrSiN 코팅 AlTiCrSiN coated				

초정밀 장비 및 측정기

최신의 초정밀 연마기 (629XS)
The Newest Manufacturing Equipment (629XS)

스타공구는 최고의 장비사용으로 모든 표준품들에 대해 품질을 크게 향상시켰습니다.

We,Startools, have improved a big quality on our standard products by using the Best Manufacturing Machine

초정밀 원통연마기 (NP3)
The Accurate Circular Grinding Equipment. (NP3)

피삭재의 기울어진 각도에 따른 정확한 가공깊이의 유효장 엔드밀 제작.

We are making very accurate Long Reach Endmills depending on the inclined angle of workpiece

초정밀 3차원 측정기
HELICHECK PLUS / PLUS LONG

공구직경 0.1mm 에서 100mm 까지 측정가능 검사장비로 양산시 각 공구를 측정하고 있습니다.

We can measure the Micro Range (0.1mm~100mm) of Tool Diameter and are inspecting our endmills on production.

리브 시리즈!

Long Reach End Mills!

리브가공과 같은 **깊은 깊이** 가공용 엔드밀

End mills specially designed for long reach applications.

복잡한 가공조건에서의 고속가공 솔루션
Relevant for high speed milling in challenging environments

날경 ø0.2 부터 ø12 mm
유효장 0.5mm 에서 50mm 까지의 제품군

- Come with cutting diameters from ø0.2 through ø12 mm and lengths of reach from 0.5mm through 50mm

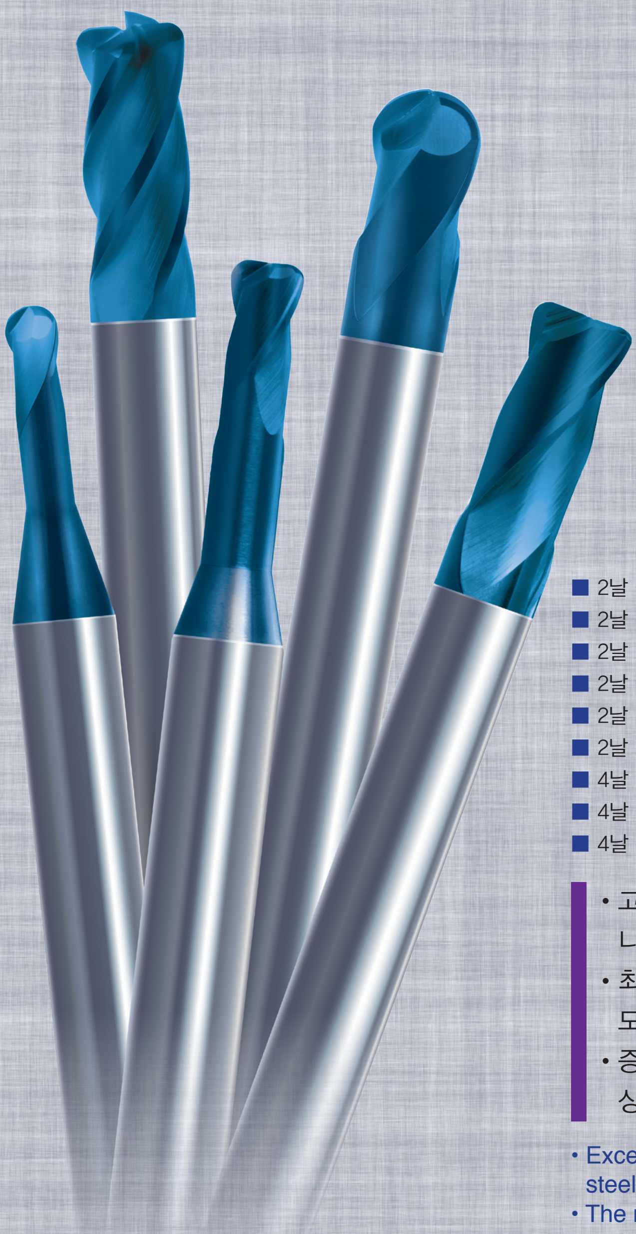
볼, 평, 코너 R 형태의 다양한 사이즈의 표준가공용과 고경도 소재가공용 제품이 있어 선택의 폭이 넓습니다.
최적의 인선 치수 형상 설계로 고속 정밀가공에 적합합니다.

- Available with ball end, square and corner radius types for general and high performance milling operations.
- Rigid cutting edge with controlled tolerances enables high speed operations and allows dimensional accuracy.

초고경도 소재 가공용 엔드밀!

"Up to 68 HRc"

High performance end mills for super hardened steels



마이크로 입자 소결 초경
Micrograin solid carbide

인선부 치수와 형상의 최적설계
Optimized cutting edge geometry

최신 나노컴포지트 코팅
Nanocomposite coating

- 2날 볼 리브 2F Necked Ball End
- 2날 평 리브 2F Necked Square End
- 2날 코너 R 리브 2F Necked Corner Radius
- 2날 볼 2F Ball End
- 2날 평 2F Square End
- 2날 코너 R 롱 2F Corner Radius Long
- 4날 평 4F Square End
- 4날 코너 R 롱 4F Corner Radius Long
- 4날 코너 R 리브 4F Necked Corner Radius

- 고경도 소재 가공에서 뛰어난 절삭성을 보여줍니다.
- 최신 나노컴포지트 코팅으로 높은 가공온도에서도 절삭성능이 유지됩니다.
- 증가된 강성으로 채터링 없는 절삭이 가능해 향상된 조도의 절삭면을 얻을 수 있습니다.

- Excellent cutting performance on super hardened steels.
- The new nanocomposite coating allows better cutting performance in high temperature environments.
- Improved rigidity enables chatter-free milling giving better workpiece surface quality.

일반 스틸용에 적합한
Economic 시리즈 HRc 50 이하

High performance endmills for prehardened steels (Below HRc 50)

초미립자 소결 초경
MicroGrain Carbide

최적의 설계로 날부 강성 유지
Optimized cutting edge geometry

최신 나노컴포지트 코팅
AlTiCrSiN Coat

제품군

- 2BRE 2F Ball End
- 2SRE 2F Square End
- 4SRE 4F Square End
- 2SLE 2F Square End Long
- 4SLE 4F Square End Long
- 2CLE 2F Corner Radius Long
- 4CLE 4F Corner Radius Long

스페셜 엔드밀 솔루션

Custom Made End Mills

- 다양한 특수목적 용도의 엔드밀을 제작해 제공합니다.
- 축적된 형상가공 제작기술로 최상의 제품을 제공합니다.

- StarTool offers a variety of special end mills to suit a wide range of applications.
- We offer the quality end mills with the leading edge of technology.

The specialist in specials : StarTool

탭핑 머신에 적합한 엔드밀

End Mills for Maximum Meterial Removal

절삭날은 알루미늄과 플라스틱과 같은 비철 비금속 소재의 가공에서 최상의 성능을 내도록 설계됐습니다.

Flute geometry is designed for superior performance in aluminum and plastic milling applications.

절삭날은 1날 또는 2날로 구성됩니다. 역방향 헬릭스의 적용도 가능하고 이 경우 위쪽 방향의 버가 생기지 않습니다.

The products come with 1 or 2 flutes. A left hand helix/right hand cut is also available, which does not make any raised burs.

스타공구(주)
Star Tool Co., Ltd.

For Super Hardened Steels

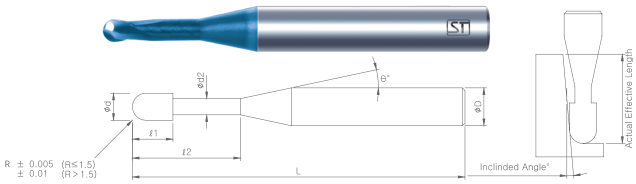
SPEED-1

2날 볼 리브-초고경도용

2F Necked Ball End for Super Hardened Steels

2NBH

2 | HX30° | M/G Carbide | S-HC Coated



Features

- Extended neck style for long reach applications
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- A highly-wear resistant nanocomposite coating for oxidation resistance and extreme hardness
- Cutting geometry specifically engineered for super hardened steels
- Improved workpiece surface quality

특징

- 롱 넥 형상으로 깊은 가공에 적합함
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 고 내마모성의 나노컴포지트 코팅으로 내열성이 좋고 고경도소재의 가공에 적합함
- 절삭날의 치수와 형상은 초고경도 소재 가공에 최적화됨
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NBH 020 050	0.2 X R0.1	0.15	0.50	0.18	15	45	4	0.55	0.56	0.58	0.6	0.64
2NBH 020 075	0.2 X R0.1	0.15	0.75	0.18	15	45	4	0.81	0.83	0.86	0.89	0.95
2NBH 020 100	0.2 X R0.1	0.15	1.00	0.18	15	45	4	1.06	1.1	1.13	1.17	1.26
2NBH 020 125	0.2 X R0.1	0.15	1.25	0.18	15	45	4	1.32	1.37	1.41	1.46	1.57
2NBH 020 150	0.2 X R0.1	0.15	1.50	0.18	15	45	4	1.58	1.63	1.69	1.75	1.88
2NBH 020 200	0.2 X R0.1	0.15	2.00	0.18	15	45	4	2.1	2.17	2.24	2.32	2.5
2NBH 020 250	0.2 X R0.1	0.15	2.50	0.18	15	45	4	2.61	2.7	2.8	2.9	3.12
2NBH 020 300	0.2 X R0.1	0.15	3.00	0.18	15	45	4	3.13	3.24	3.35	3.47	3.75
2NBH 030 050	0.3 X R0.15	0.25	0.50	0.28	15	45	4	0.55	0.56	0.57	0.59	0.63
2NBH 030 075	0.3 X R0.15	0.25	0.75	0.28	15	45	4	0.80	0.83	0.85	0.88	0.94
2NBH 030 100	0.3 X R0.15	0.25	1.00	0.28	15	45	4	1.06	1.09	1.13	1.17	1.25
2NBH 030 125	0.3 X R0.15	0.25	1.25	0.28	15	45	4	1.32	1.36	1.41	1.45	1.56
2NBH 030 150	0.3 X R0.15	0.25	1.50	0.28	15	45	4	1.58	1.63	1.68	1.74	1.87
2NBH 030 200	0.3 X R0.15	0.25	2.00	0.28	15	45	4	2.10	2.16	2.24	2.32	2.49
2NBH 030 250	0.3 X R0.15	0.25	2.50	0.28	15	45	4	2.61	2.70	2.79	2.89	3.11
2NBH 030 300	0.3 X R0.15	0.25	3.00	0.28	15	45	4	3.13	3.23	3.35	3.47	3.73
2NBH 040 100	0.4 X R0.2	0.30	1.00	0.37	15	45	4	1.08	1.11	1.14	1.18	1.26
2NBH 040 150	0.4 X R0.2	0.30	1.50	0.37	15	45	4	1.60	1.65	1.70	1.75	1.88
2NBH 040 200	0.4 X R0.2	0.30	2.00	0.37	15	45	4	2.11	2.18	2.25	2.33	2.50
2NBH 040 250	0.4 X R0.2	0.30	2.50	0.37	15	45	4	2.63	2.72	2.81	2.90	3.12

2날 볼 리브-초고경도용
2F Necked Ball End for Super Hardened Steels

2NBH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle Θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NBH 040 300	0.4 X R0.2	0.30	3.00	0.37	15	45	4	3.15	3.25	3.36	3.48	3.75
2NBH 040 350	0.4 X R0.2	0.30	3.50	0.37	15	45	4	3.66	3.78	3.91	4.05	4.37
2NBH 040 400	0.4 X R0.2	0.30	4.00	0.37	15	45	4	4.18	4.32	4.47	4.63	4.99
2NBH 040 450	0.4 X R0.2	0.30	4.50	0.37	15	45	4	4.70	4.85	5.02	5.20	5.61
2NBH 040 500	0.4 X R0.2	0.30	5.00	0.37	15	45	4	5.21	5.39	5.58	5.78	6.23
2NBH 040 600	0.4 X R0.2	0.30	6.00	0.37	15	45	4	6.25	6.46	6.69	6.93	7.47
2NBH 040 800	0.4 X R0.2	0.30	8.00	0.37	15	45	4	8.32	8.60	8.90	9.23	9.96
2NBH 050 100	0.5 X R0.25	0.35	1.00	0.47	15	45	4	1.08	1.11	1.14	1.17	1.25
2NBH 050 150	0.5 X R0.25	0.35	1.50	0.47	15	45	4	1.59	1.64	1.69	1.75	1.87
2NBH 050 200	0.5 X R0.25	0.35	2.00	0.47	15	45	4	2.11	2.18	2.25	2.32	2.49
2NBH 050 250	0.5 X R0.25	0.35	2.50	0.47	15	45	4	2.63	2.71	2.80	2.90	3.11
2NBH 050 300	0.5 X R0.25	0.35	3.00	0.47	15	45	4	3.15	3.25	3.35	3.47	3.73
2NBH 050 400	0.5 X R0.25	0.35	4.00	0.47	15	45	4	4.18	4.32	4.46	4.62	4.98
2NBH 050 500	0.5 X R0.25	0.35	5.00	0.47	15	45	4	5.21	5.39	5.57	5.77	6.22
2NBH 050 600	0.5 X R0.25	0.35	6.00	0.47	15	45	4	6.25	6.46	6.68	6.92	7.46
2NBH 050 800	0.5 X R0.25	0.35	8.00	0.47	15	45	4	8.31	8.59	8.90	9.22	9.95
2NBH 050 1000	0.5 X R0.25	0.35	10.00	0.47	15	45	4	10.38	10.73	11.11	11.52	12.44
2NBH 060 100	0.6 X R0.3	0.40	1.00	0.57	15	45	4	1.08	1.10	1.13	1.16	1.23
2NBH 060 200	0.6 X R0.3	0.40	2.00	0.57	15	45	4	2.11	2.17	2.24	2.31	2.48
2NBH 060 250	0.6 X R0.3	0.40	2.50	0.57	15	45	4	2.63	2.71	2.80	2.89	3.10
2NBH 060 300	0.6 X R0.3	0.40	3.00	0.57	15	45	4	3.14	3.24	3.35	3.46	3.72
2NBH 060 350	0.6 X R0.3	0.40	3.50	0.57	15	45	4	3.66	3.78	3.90	4.04	4.34
2NBH 060 400	0.6 X R0.3	0.40	4.00	0.57	15	45	4	4.18	4.31	4.46	4.61	4.96
2NBH 060 450	0.6 X R0.3	0.40	4.50	0.57	15	45	4	4.69	4.85	5.01	5.19	5.59
2NBH 060 500	0.6 X R0.3	0.40	5.00	0.57	15	45	4	5.21	5.38	5.57	5.76	6.21
2NBH 060 550	0.6 X R0.3	0.40	5.50	0.57	15	45	4	5.73	5.92	6.12	6.34	6.83
2NBH 060 600	0.6 X R0.3	0.40	6.00	0.57	15	45	4	6.24	6.45	6.67	6.91	7.45
2NBH 060 800	0.6 X R0.3	0.40	8.00	0.57	15	45	4	8.31	8.59	8.89	9.21	9.94
2NBH 060 1000	0.6 X R0.3	0.40	10.00	0.57	15	45	4	10.38	10.73	11.11	11.51	12.42
2NBH 060 1200	0.6 X R0.3	0.40	12.00	0.57	15	45	4	12.45	12.87	13.32	13.81	14.91
2NBH 070 200	0.7 X R0.35	0.45	2.00	0.66	15	45	4	2.13	2.19	2.26	2.33	2.49
2NBH 070 400	0.7 X R0.35	0.45	4.00	0.66	15	45	4	4.20	4.33	4.47	4.63	4.98
2NBH 070 600	0.7 X R0.35	0.45	6.00	0.66	15	45	4	6.26	6.47	6.69	6.93	7.46
2NBH 070 800	0.7 X R0.35	0.45	8.00	0.66	15	45	4	8.33	8.61	8.91	9.23	9.95
2NBH 080 200	0.8 X R0.4	0.50	2.00	0.77	15	45	4	2.11	2.17	2.23	2.30	2.45
2NBH 080 300	0.8 X R0.4	0.50	3.00	0.77	15	45	4	3.14	3.24	3.34	3.45	3.70
2NBH 080 400	0.8 X R0.4	0.50	4.00	0.77	15	45	4	4.17	4.31	4.45	4.60	4.94
2NBH 080 500	0.8 X R0.4	0.50	5.00	0.77	15	45	4	5.21	5.38	5.56	5.75	6.18
2NBH 080 600	0.8 X R0.4	0.50	6.00	0.77	15	45	4	6.24	6.45	6.66	6.90	7.43
2NBH 080 800	0.8 X R0.4	0.50	8.00	0.77	15	45	4	8.31	8.58	8.88	9.20	9.91
2NBH 080 1000	0.8 X R0.4	0.50	10.00	0.77	15	45	4	10.38	10.72	11.10	11.50	12.40
2NBH 080 1200	0.8 X R0.4	0.50	12.00	0.77	15	45	4	12.44	12.86	13.31	13.80	14.89
2NBH 090 200	0.9X R0.45	0.60	2.00	0.85	15	45	4	2.14	2.20	2.27	2.33	2.49

2날 볼 리브-초고경도용
2F Necked Ball End for Super Hardened Steels
2NBH

For Super Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NBH 090 400	0.9X R0.45	0.60	4.00	0.85	15	45	4	4.21	4.34	4.48	4.63	4.97
2NBH 090 600	0.9X R0.45	0.60	6.00	0.85	15	45	4	6.28	6.48	6.70	6.93	7.46
2NBH 090 800	0.9X R0.45	0.60	8.00	0.85	15	45	4	8.35	8.62	8.92	9.23	9.95
2NBH 090 1000	0.9X R0.45	0.60	10.00	0.85	15	45	4	10.41	10.76	11.13	11.53	12.43
2NBH 100 200	1.0 X R0.6	0.80	2.00	0.95	15	45	4	2.14	2.20	2.26	2.33	2.48
2NBH 100 300	1.0 X R0.5	0.80	3.00	0.95	15	45	4	3.18	3.27	3.37	3.48	3.72
2NBH 100 400	1.0 X R0.5	0.80	4.00	0.95	15	45	4	4.21	4.34	4.48	4.63	4.96
2NBH 100 400 S6	1.0 X R0.5	0.80	4.00	0.95	15	50	6	4.21	4.34	4.48	4.63	4.96
2NBH 100 500	1.0 X R0.5	0.80	5.00	0.95	15	45	4	5.24	5.41	5.59	5.78	6.21
2NBH 100 600	1.0 X R0.5	0.80	6.00	0.95	15	45	4	6.28	6.48	6.69	6.93	7.45
2NBH 100 600 S6	1.0 X R0.5	0.80	6.00	0.95	15	50	6	6.28	6.48	6.69	6.93	7.45
2NBH 100 800	1.0 X R0.5	0.80	8.00	0.95	15	45	4	8.34	8.62	8.91	9.23	9.93
2NBH 100 800 S6	1.0 X R0.5	0.80	8.00	0.95	15	50	6	8.34	8.62	8.91	9.23	9.93
2NBH 100 1000	1.0 X R0.5	0.80	10.00	0.95	15	45	4	10.41	10.76	11.13	11.53	12.42
2NBH 100 1000 S6	1.0 X R0.5	0.80	10.00	0.95	15	50	6	10.41	10.76	11.13	11.53	12.42
2NBH 100 1200	1.0 X R0.5	0.80	12.00	0.95	15	45	4	12.48	12.90	13.34	13.83	14.91
2NBH 100 1200 S6	1.0 X R0.5	0.80	12.00	0.95	15	50	6	12.48	12.90	13.34	13.83	14.91
2NBH 100 1400	1.0 X R0.5	0.80	14.00	0.95	15	45	4	14.55	15.04	15.56	16.13	17.39
2NBH 100 1600	1.0 X R0.5	0.80	16.00	0.95	15	50	4	16.61	17.17	17.78	18.43	19.88
2NBH 100 1600 S6	1.0 X R0.5	0.80	16.00	0.95	15	60	6	16.61	17.17	17.78	18.43	19.88
2NBH 100 1800	1.0 X R0.5	0.80	18.00	0.95	15	50	4	18.68	19.31	19.99	20.72	22.37
2NBH 100 2000	1.0 X R0.5	0.80	20.00	0.95	15	50	4	20.75	21.45	22.21	23.02	24.85
2NBH 100 2000 S6	1.0 X R0.5	0.80	20.00	0.95	15	60	6	20.75	21.45	22.21	23.02	24.85
2NBH 120 400	1.2 X R0.6	1.20	4.00	1.14	15	45	4	4.23	4.35	4.49	4.63	4.96
2NBH 120 600	1.2 X R0.6	1.20	6.00	1.14	15	45	4	6.29	6.49	6.70	6.93	7.45
2NBH 120 800	1.2 X R0.6	1.20	8.00	1.14	15	45	4	8.36	8.63	8.92	9.23	9.93
2NBH 120 1000	1.2 X R0.6	1.20	10.00	1.14	15	45	4	10.43	10.77	11.14	11.53	12.42
2NBH 120 1200	1.2 X R0.6	1.20	12.00	1.14	15	45	4	12.49	12.91	13.35	13.83	14.91
2NBH 120 1600	1.2 X R0.6	1.20	16.00	1.14	15	50	4	16.63	17.19	17.79	18.43	19.88
2NBH 120 2000	1.2 X R0.6	1.20	20.00	1.14	15	50	4	20.76	21.47	22.22	23.03	24.85
2NBH 150 300	1.5 X R0.75	1.35	3.00	1.44	15	45	4	3.19	3.27	3.36	3.46	3.68
2NBH 150 400	1.5 X R0.75	1.35	4.00	1.44	15	45	4	4.22	4.34	4.47	4.61	4.92
2NBH 150 400 S6	1.5 X R0.75	1.35	4.00	1.44	15	50	6	4.22	4.34	4.47	4.61	4.92
2NBH 150 600	1.5 X R0.75	1.35	6.00	1.44	15	45	4	6.29	6.48	6.69	6.91	7.41
2NBH 150 600 S6	1.5 X R0.75	1.35	6.00	1.44	15	50	6	6.29	6.48	6.69	6.91	7.41
2NBH 150 800	1.5 X R0.75	1.35	8.00	1.44	15	45	4	8.35	8.62	8.90	9.21	9.90
2NBH 150 800 S6	1.5 X R0.75	1.35	8.00	1.44	15	50	6	8.35	8.62	8.90	9.21	9.90
2NBH 150 1000	1.5 X R0.75	1.35	10.00	1.44	15	45	4	10.42	10.76	11.12	11.51	12.38
2NBH 150 100 S6	1.5 X R0.75	1.35	10.00	1.44	15	50	6	10.42	10.76	11.12	11.51	12.38
2NBH 150 1200	1.5 X R0.75	1.35	12.00	1.44	15	45	4	12.49	12.90	13.34	13.81	14.87
2NBH 150 1200 S6	1.5 X R0.75	1.35	12.00	1.44	15	50	6	12.49	12.90	13.34	13.81	14.87
2NBH 150 1400	1.5 X R0.75	1.35	14.00	1.44	15	45	4	14.56	15.04	15.55	16.11	17.36
2NBH 150 1600	1.5 X R0.75	1.35	16.00	1.44	15	50	4	16.62	17.18	17.77	18.41	19.84

2날 볼 리브-초고경도용
2F Necked Ball End for Super Hardened Steels
2NBH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NBH 150 1600 S6	1.5 X R0.75	1.35	16.00	1.44	15	60	6	16.62	17.18	17.77	18.41	19.84
2NBH 150 2000	1.5 X R0.75	1.35	20.00	1.44	15	50	4	20.76	21.46	22.20	23.01	free
2NBH 150 2000 S6	1.5 X R0.75	1.35	20.00	1.44	15	60	6	20.76	21.46	22.20	23.01	24.81
2NBH 150 2500	1.5 X R0.75	1.35	25.00	1.44	15	60	4	25.93	26.80	27.75	28.76	free
2NBH 150 3000	1.5 X R0.75	1.35	30.00	1.44	15	70	4	31.10	32.15	33.29	34.51	free
2NBH 160 600	1.6 X R0.8	1.60	6.00	1.55	15	45	4	6.27	6.46	6.66	6.88	7.38
2NBH 160 800	1.6 X R0.8	1.60	8.00	1.55	15	45	4	8.33	8.60	8.88	9.18	9.86
2NBH 160 1000	1.6 X R0.8	1.60	10.00	1.55	15	45	4	10.40	10.74	11.09	11.48	12.35
2NBH 160 1200	1.6 X R0.8	1.60	12.00	1.55	15	45	4	12.47	12.88	13.31	13.78	14.83
2NBH 160 1600	1.6 X R0.8	1.60	16.00	1.55	15	50	4	16.60	17.15	17.74	18.38	19.81
2NBH 160 2000	1.6 X R0.8	1.60	20.00	1.55	15	50	4	20.74	21.43	22.18	22.98	free
2NBH 200 400	2.0 X R1.0	1.80	4.00	1.92	15	45	4	4.25	4.36	4.49	4.62	4.91
2NBH 200 600	2.0 X R1.0	1.80	6.00	1.92	15	45	4	6.32	6.50	6.70	6.92	7.40
2NBH 200 600 S6	2.0 X R1.0	1.80	6.00	1.92	15	50	6	6.32	6.50	6.70	6.92	7.40
2NBH 200 800	2.0 X R1.0	1.80	8.00	1.92	15	45	4	8.38	8.64	8.92	9.22	9.88
2NBH 200 800 S6	2.0 X R1.0	1.80	8.00	1.92	15	50	6	8.38	8.64	8.92	9.22	9.88
2NBH 200 1000	2.0 X R1.0	1.80	10.00	1.92	15	45	4	10.45	10.78	11.14	11.52	12.37
2NBH 200 1000 S6	2.0 X R1.0	1.80	10.00	1.92	15	50	6	10.45	10.78	11.14	11.52	12.37
2NBH 200 1200	2.0 X R1.0	1.80	12.00	1.92	15	45	4	12.52	12.92	13.35	13.82	14.86
2NBH 200 1200 S6	2.0 X R1.0	1.80	12.00	1.92	15	50	6	12.52	12.92	13.35	13.82	14.86
2NBH 200 1400	2.0 X R1.0	1.80	14.00	1.92	15	45	4	14.59	15.06	15.57	16.11	17.34
2NBH 200 1600	2.0 X R1.0	1.80	16.00	1.92	15	50	4	16.65	17.20	17.79	18.41	19.83
2NBH 200 1600 S6	2.0 X R1.0	1.80	16.00	1.92	15	60	6	16.65	17.20	17.79	18.41	19.83
2NBH 200 1800	2.0 X R1.0	1.80	18.00	1.92	15	50	4	18.72	19.34	20.00	20.71	free
2NBH 200 2000	2.0 X R1.0	1.80	20.00	1.92	15	50	4	20.79	21.48	22.22	23.01	free
2NBH 200 2000 S6	2.0 X R1.0	1.80	20.00	1.92	15	60	6	20.79	21.48	22.22	23.01	24.80
2NBH 200 2500	2.0 X R1.0	1.80	25.00	1.92	15	60	4	25.96	26.83	27.76	28.76	free
2NBH 200 2500 S6	2.0 X R1.0	1.80	25.00	1.92	15	60	6	25.96	26.83	27.76	28.76	31.02
2NBH 200 3000	2.0 X R1.0	1.80	30.00	1.92	15	70	4	31.13	32.18	33.30	free	free
2NBH 200 3500	2.0 X R1.0	1.80	35.00	1.92	15	70	4	36.29	37.52	38.84	free	free
2NBH 200 4000	2.0 X R1.0	1.80	40.00	1.92	15	80	4	41.46	42.87	free	free	free
2NBH 250 800	2.5 X R1.25	2.50	8.00	2.39	15	45	4	8.43	8.68	8.95	9.24	9.89
2NBH 250 1000	2.5 X R1.25	2.50	10.00	2.39	15	45	4	10.50	10.82	11.17	11.54	12.38
2NBH 250 1200	2.5 X R1.25	2.50	12.00	2.39	15	45	4	12.57	12.96	13.39	13.84	14.86
2NBH 250 1600	2.5 X R1.25	2.50	16.00	2.39	15	50	4	16.70	17.24	17.82	18.44	free
2NBH 250 2000	2.5 X R1.25	2.50	20.00	2.39	15	50	4	20.84	21.52	22.25	free	free
2NBH 250 2500	2.5 X R1.25	2.50	25.00	2.39	15	60	4	26.01	26.87	27.79	free	free
2NBH 300 600	3.0 X R1.5	3.00	6.00	2.86	15	50	6	6.42	6.59	6.77	6.97	7.41
2NBH 300 800	3.0 X R1.5	3.00	8.00	2.86	15	50	6	8.48	8.73	8.99	9.27	9.90
2NBH 300 1000	3.0 X R1.5	3.00	10.00	2.86	15	50	6	10.55	10.87	11.21	11.57	12.39
2NBH 300 1200	3.0 X R1.5	3.00	12.00	2.86	15	50	6	12.62	13.01	13.42	13.87	14.87
2NBH 300 1400	3.0 X R1.5	3.00	14.00	2.86	15	50	6	14.69	15.15	15.64	16.17	17.36
2NBH 300 1600	3.0 X R1.5	3.00	16.00	2.86	15	60	6	16.75	17.28	17.86	18.47	19.85

2날 볼 리브-초고경도용

2F Necked Ball End for Super Hardened Steels

2NBH

For Super Hardened Steels

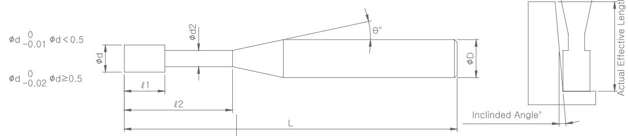
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NBH 300 1800	3.0 X R1.5	3.00	18.00	2.86	15	60	6	18.82	19.42	20.07	20.77	22.33
2NBH 300 2000	3.0 X R1.5	3.00	20.00	2.86	15	60	6	20.89	21.56	22.29	23.07	24.82
2NBH 300 2500	3.0 X R1.5	3.00	25.00	2.86	15	60	6	26.06	26.91	27.83	28.82	free
2NBH 300 3000	3.0 X R1.5	3.00	30.00	2.86	15	70	6	31.22	32.26	33.37	34.57	free
2NBH 300 3500	3.0 X R1.5	3.00	35.00	2.86	15	70	6	36.39	37.61	38.91	40.32	free
2NBH 300 4000	3.0 X R1.5	3.00	40.00	2.86	15	80	6	41.56	42.96	44.45	free	free
2NBH 300 5000	3.0 X R1.5	3.00	50.00	2.86	15	100	6	51.90	53.65	55.54	free	free
2NBH 350 1500	3.5 X R1.75	3.50	15.00	3.35	15	60	6	15.73	16.22	16.74	17.30	18.56
2NBH 350 2000	3.5 X R1.75	3.50	20.00	3.35	15	60	6	20.90	21.57	22.28	23.05	24.78
2NBH 350 2500	3.5 X R1.75	3.50	25.00	3.35	15	60	6	26.07	26.91	27.82	28.80	free
2NBH 350 3000	3.5 X R1.75	3.50	30.00	3.35	15	70	6	31.24	32.26	33.37	34.55	free
2NBH 350 4000	3.5 X R1.75	3.50	40.00	3.35	15	80	6	41.57	42.96	44.45	free	free
2NBH 400 1000	4.0 X R2.0	4.00	10.00	3.80	15	50	6	10.65	10.95	11.28	11.62	12.40
2NBH 400 1200	4.0 X R2.0	4.00	12.00	3.80	15	50	6	12.72	13.09	13.49	13.92	14.89
2NBH 400 1600	4.0 X R2.0	4.00	16.00	3.80	15	60	6	16.85	17.37	17.93	18.52	19.86
2NBH 400 2000	4.0 X R2.0	4.00	20.00	3.80	15	60	6	20.99	21.65	22.36	23.12	free
2NBH 400 2500	4.0 X R2.0	4.00	25.00	3.80	15	60	6	26.16	27.00	27.90	28.87	free
2NBH 400 3000	4.0 X R2.0	4.00	30.00	3.80	15	70	6	31.32	32.35	33.44	free	free
2NBH 400 3500	4.0 X R2.0	4.00	35.00	3.80	15	70	6	36.49	37.69	38.98	free	free
2NBH 400 4000	4.0 X R2.0	4.00	40.00	3.80	15	80	6	41.66	43.04	free	free	free
2NBH 400 5000	4.0 X R2.0	4.00	50.00	3.80	15	100	6	52.00	53.74	free	free	free
2NBH 600 1500	6.0 X R3.0	7.00	15.00	5.70	-	60	6	free	free	free	free	free
2NBH 600 2000	6.0 X R3.0	7.00	20.00	5.70	-	60	6	free	free	free	free	free
2NBH 600 3000	6.0 X R3.0	7.00	30.00	5.70	-	110	6	free	free	free	free	free
2NBH 800 2000	8.0 X R4.0	10.00	20.00	7.60	-	60	8	free	free	free	free	free
2NBH 800 3000	8.0 X R4.0	10.00	30.00	7.60	-	100	8	free	free	free	free	free
2NBH 1000 2500	10.0 X R5.0	12.00	25.00	9.50	-	70	10	free	free	free	free	free
2NBH 1000 3500	10.0 X R5.0	12.00	35.00	9.50	-	100	10	free	free	free	free	free
2NBH 1200 3000	12.0 X R6.0	14.00	30.00	11.50	-	80	12	free	free	free	free	free
2NBH 1200 4000	12.0 X R6.0	14.00	40.00	11.50	-	110	12	free	free	free	free	free

2날 평 리브-초고경도용
2F Necked Square End for Super Hardened Steels

2NSH

2 | HX30° | M/G Carbide | S-HC Coated



Features

- Extended neck style for long reach applications
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- A highly-wear resistant nanocomposite coating for oxidation resistance and extreme hardness
- Cutting geometry specifically engineered for super hardened steels
- Improved workpiece surface quality

특징

- 롱 넥 형상으로 깊은 가공에 적합함
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 고 내마모성의 나노컴포지트 코팅으로 내열성이 좋고 고경도소재의 가공에 적합함
- 절삭날의 치수와 형상은 초고경도 소재 가공에 최적화됨
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30′	1°	1°30′	2°	3°
2NSH 010 030	0.1	0.15	0.30	0.085	15	45	4	0.33	0.35	0.36	0.37	0.40
2NSH 010 050	0.1	0.15	0.50	0.085	15	45	4	0.54	0.56	0.58	0.60	0.65
2NSH 010 100	0.1	0.15	1.00	0.085	15	45	4	1.06	1.09	1.13	1.18	1.27
2NSH 015 030	0.15	0.20	0.30	0.13	15	45	4	0.34	0.36	0.37	0.38	0.41
2NSH 015 050	0.15	0.20	0.50	0.13	15	45	4	0.55	0.57	0.59	0.61	0.66
2NSH 015 100	0.15	0.20	1.00	0.13	15	45	4	1.07	1.10	1.14	1.19	1.28
2NSH 020 050	0.2	0.30	0.50	0.18	15	45	4	0.55	0.57	0.59	0.61	0.66
2NSH 020 100	0.2	0.30	1.00	0.18	15	45	4	1.07	1.10	1.14	1.19	1.28
2NSH 020 150	0.2	0.30	1.50	0.18	15	45	4	1.58	1.64	1.70	1.76	1.91
2NSH 020 200	0.2	0.30	2.00	0.18	15	45	4	2.10	2.17	2.25	2.34	2.53
2NSH 020 300	0.2	0.30	3.00	0.18	15	45	4	3.13	3.24	3.36	3.49	3.77
2NSH 020 400	0.2	0.30	4.00	0.18	15	45	4	4.17	4.31	4.47	4.64	5.01
2NSH 030 100	0.3	0.40	1.00	0.28	15	45	4	1.07	1.10	1.14	1.19	1.28
2NSH 030 150	0.3	0.40	1.50	0.28	15	45	4	1.58	1.64	1.70	1.76	1.91
2NSH 030 200	0.3	0.40	2.00	0.28	15	45	4	2.10	2.17	2.25	2.34	2.53
2NSH 030 300	0.3	0.40	3.00	0.28	15	45	4	3.13	3.24	3.36	3.49	3.77
2NSH 030 400	0.3	0.40	4.00	0.28	15	45	4	4.17	4.31	4.47	4.64	5.01
2NSH 030 600	0.3	0.40	6.00	0.28	15	45	4	6.24	6.45	6.69	6.94	7.50
2NSH 030 800	0.3	0.40	8.00	0.28	15	45	4	8.30	8.59	8.90	9.24	9.99
2NSH 040 100	0.4	0.60	1.00	0.37	15	45	4	1.09	1.12	1.17	1.21	1.31

2NSH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NSH 040 150	0.4	0.60	1.50	0.37	15	45	4	1.60	1.66	1.72	1.78	1.93
2NSH 040 200	0.4	0.60	2.00	0.37	15	45	4	2.12	2.19	2.27	2.36	2.55
2NSH 040 250	0.4	0.60	2.50	0.37	15	45	4	2.64	2.73	2.83	2.93	3.17
2NSH 040 300	0.4	0.60	3.00	0.37	15	45	4	3.15	3.26	3.38	3.51	3.79
2NSH 040 350	0.4	0.60	3.50	0.37	15	45	4	3.67	3.80	3.94	4.08	4.42
2NSH 040 400	0.4	0.60	4.00	0.37	15	45	4	4.19	4.33	4.49	4.66	5.04
2NSH 040 500	0.4	0.60	5.00	0.37	15	45	4	5.22	5.40	5.60	5.81	6.28
2NSH 040 600	0.4	0.60	6.00	0.37	15	45	4	6.25	6.47	6.71	6.96	7.52
2NSH 040 800	0.4	0.60	8.00	0.37	15	45	4	8.32	8.61	8.92	9.26	10.01
2NSH 040 1000	0.4	0.60	10.00	0.37	15	45	4	10.39	10.75	11.14	11.56	12.50
2NSH 040 1200	0.4	0.60	12.00	0.37	15	45	4	12.46	12.89	13.36	13.86	14.98
2NSH 050 100	0.5	0.70	1.00	0.47	15	45	4	1.09	1.12	1.17	1.21	1.31
2NSH 050 150	0.5	0.70	1.50	0.47	15	45	4	1.60	1.66	1.72	1.78	1.93
2NSH 050 200	0.5	0.70	2.00	0.47	15	45	4	2.12	2.19	2.27	2.36	2.55
2NSH 050 250	0.5	0.70	2.50	0.47	15	45	4	2.64	2.73	2.83	2.93	3.17
2NSH 050 300	0.5	0.70	3.00	0.47	15	45	4	3.15	3.26	3.38	3.51	3.79
2NSH 050 350	0.5	0.70	3.50	0.47	15	45	4	3.67	3.80	3.94	4.08	4.42
2NSH 050 400	0.5	0.70	4.00	0.47	15	45	4	4.19	4.33	4.49	4.66	5.04
2NSH 050 500	0.5	0.70	5.00	0.47	15	45	4	5.22	5.40	5.60	5.81	6.28
2NSH 050 600	0.5	0.70	6.00	0.47	15	45	4	6.25	6.47	6.71	6.96	7.52
2NSH 050 800	0.5	0.70	8.00	0.47	15	45	4	8.32	8.61	8.92	9.26	10.01
2NSH 050 1000	0.5	0.70	10.00	0.47	15	45	4	10.39	10.75	11.14	11.56	12.50
2NSH 050 1200	0.5	0.70	12.00	0.47	15	45	4	12.46	12.89	13.36	13.86	14.98
2NSH 060 150	0.6	0.90	1.50	0.57	15	45	4	1.60	1.66	1.72	1.78	1.93
2NSH 060 200	0.6	0.90	2.00	0.57	15	45	4	2.12	2.19	2.27	2.36	2.55
2NSH 060 300	0.6	0.90	3.00	0.57	15	45	4	3.15	3.26	3.38	3.51	3.79
2NSH 060 400	0.6	0.90	4.00	0.57	15	45	4	4.19	4.33	4.49	4.66	5.04
2NSH 060 500	0.6	0.90	5.00	0.57	15	45	4	5.22	5.40	5.60	5.81	6.28
2NSH 060 600	0.6	0.90	6.00	0.57	15	45	4	6.25	6.47	6.71	6.96	7.52
2NSH 060 800	0.6	0.90	8.00	0.57	15	45	4	8.32	8.61	8.92	9.26	10.01
2NSH 060 1000	0.6	0.90	10.00	0.57	15	45	4	10.39	10.75	11.14	11.56	12.50
2NSH 060 1200	0.6	0.90	12.00	0.57	15	45	4	12.46	12.89	13.36	13.86	14.98
2NSH 060 1600	0.6	0.90	16.00	0.57	15	45	4	16.59	17.17	17.79	18.46	19.95
2NSH 070 200	0.7	0.80	2.00	0.66	15	45	4	2.14	2.21	2.29	2.38	2.57
2NSH 070 300	0.7	0.80	3.00	0.66	15	45	4	3.17	3.28	3.40	3.53	3.82
2NSH 070 400	0.7	0.80	4.00	0.66	15	45	4	4.21	4.35	4.51	4.68	5.06
2NSH 070 600	0.7	0.80	6.00	0.66	15	45	4	6.27	6.49	6.73	6.98	7.55
2NSH 070 800	0.7	0.80	8.00	0.66	15	45	4	8.34	8.63	8.94	9.28	10.03
2NSH 070 1000	0.7	0.80	10.00	0.66	15	45	4	10.41	10.77	11.16	11.58	12.52
2NSH 080 200	0.8	1.20	2.00	0.77	15	45	4	2.12	2.19	2.27	2.36	2.55
2NSH 080 300	0.8	1.20	3.00	0.77	15	45	4	3.15	3.26	3.38	3.51	3.79
2NSH 080 400	0.8	1.20	4.00	0.77	15	45	4	4.19	4.33	4.49	4.66	5.04
2NSH 080 500	0.8	1.20	5.00	0.77	15	45	4	5.22	5.40	5.60	5.81	6.28

2날 평 리브-초고경도용
2F Necked Square End for Super Hardened Steels
2NSH

For Super Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle ⊖°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
2NSH 080 600	0.8	1.20	6.00	0.77	15	45	4	6.25	6.47	6.71	6.96	7.52
2NSH 080 800	0.8	1.20	8.00	0.77	15	45	4	8.32	8.61	8.92	9.26	10.01
2NSH 080 1000	0.8	1.20	10.00	0.77	15	45	4	10.39	10.75	11.14	11.56	12.50
2NSH 080 1200	0.8	1.20	12.00	0.77	15	45	4	12.46	12.89	13.36	13.86	14.98
2NSH 080 1600	0.8	1.20	16.00	0.77	15	45	4	16.59	17.17	17.79	18.46	19.95
2NSH 080 2000	0.8	1.20	20.00	0.77	15	45	4	20.73	21.45	22.22	23.06	24.93
2NSH 080 2500	0.8	1.20	25.00	0.77	15	45	4	25.89	26.80	27.76	28.81	free
2NSH 090 200	0.9	1.40	2.00	0.85	15	45	4	2.16	2.23	2.32	2.40	2.60
2NSH 090 400	0.9	1.40	4.00	0.85	15	45	4	4.23	4.37	4.53	4.70	5.08
2NSH 090 600	0.9	1.40	6.00	0.85	15	45	4	6.29	6.51	6.75	7.00	7.57
2NSH 090 800	0.9	1.40	8.00	0.85	15	45	4	8.36	8.65	8.96	9.30	10.06
2NSH 090 1000	0.9	1.40	10.00	0.85	15	45	4	10.43	10.79	11.18	11.60	12.54
2NSH 100 200	1	1.50	2.00	0.95	15	45	4	2.16	2.23	2.32	2.40	2.60
2NSH 100 300	1	1.50	3.00	0.95	15	45	4	3.19	3.30	3.42	3.55	3.84
2NSH 100 400	1	1.50	4.00	0.95	15	45	4	4.23	4.37	4.53	4.70	5.08
2NSH 100 500	1	1.50	5.00	0.95	15	45	4	5.26	5.44	5.64	5.85	6.33
2NSH 100 600	1	1.50	6.00	0.95	15	45	4	6.29	6.51	6.75	7.00	7.57
2NSH 100 800	1	1.50	8.00	0.95	15	45	4	8.36	8.65	8.96	9.30	10.06
2NSH 100 1000	1	1.50	10.00	0.95	15	45	4	10.43	10.79	11.18	11.60	12.54
2NSH 100 1200	1	1.50	12.00	0.95	15	45	4	12.50	12.93	13.40	13.90	15.03
2NSH 100 1400	1	1.50	14.00	0.95	15	45	4	14.56	15.07	15.61	16.20	17.52
2NSH 100 1600	1	1.50	16.00	0.95	15	50	4	16.63	17.21	17.83	18.50	20.00
2NSH 100 1800	1	1.50	18.00	0.95	15	50	4	18.70	19.35	20.05	20.80	22.49
2NSH 100 2000	1	1.50	20.00	0.95	15	50	4	20.76	21.49	22.26	23.10	24.97
2NSH 100 2500	1	1.50	25.00	0.95	15	60	4	25.93	26.84	27.81	28.85	free
2NSH 100 3000	1	1.50	30.00	0.95	15	60	4	31.10	32.19	33.35	34.60	free
2NSH 120 400	1.2	1.80	4.00	1.14	15	45	4	4.25	4.39	4.55	4.72	5.11
2NSH 120 600	1.2	1.80	6.00	1.14	15	45	4	6.31	6.53	6.77	7.02	7.59
2NSH 120 800	1.2	1.80	8.00	1.14	15	45	4	8.38	8.67	8.99	9.32	10.08
2NSH 120 1000	1.2	1.80	10.00	1.14	15	45	4	10.45	10.81	11.20	11.62	12.57
2NSH 120 1200	1.2	1.80	12.00	1.14	15	45	4	12.51	12.95	13.42	13.92	15.05
2NSH 120 1600	1.2	1.80	16.00	1.14	15	50	4	16.65	17.23	17.85	18.52	20.02
2NSH 120 2000	1.2	1.80	20.00	1.14	15	50	4	20.78	21.51	22.29	23.12	25.00
2NSH 120 2500	1.2	1.80	25.00	1.14	15	60	4	25.95	26.86	27.83	28.87	free
2NSH 150 400	1.5	2.30	4.00	1.44	15	45	4	4.25	4.39	4.55	4.72	5.11
2NSH 150 600	1.5	2.30	6.00	1.44	15	45	4	6.31	6.53	6.77	7.02	7.59
2NSH 150 800	1.5	2.30	8.00	1.44	15	45	4	8.38	8.67	8.99	9.32	10.08
2NSH 150 1000	1.5	2.30	10.00	1.44	15	45	4	10.45	10.81	11.20	11.62	12.57
2NSH 150 1200	1.5	2.30	12.00	1.44	15	45	4	12.51	12.95	13.42	13.92	15.05
2NSH 150 1600	1.5	2.30	16.00	1.44	15	50	4	16.65	17.23	17.85	18.52	20.02
2NSH 150 1800	1.5	2.30	18.00	1.44	15	50	4	18.72	19.37	20.07	20.82	22.51
2NSH 150 2000	1.5	2.30	20.00	1.44	15	50	4	20.78	21.51	22.29	23.12	free
2NSH 150 2500	1.5	2.30	25.00	1.44	15	60	4	25.95	26.86	27.83	28.87	free

2날 평 리브-초고경도용
2F Necked Square End for Super Hardened Steels

2NSH

For Super Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle ⊖°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NSH 150 3000	1.5	2.30	30.00	1.44	15	70	4	31.12	32.21	33.37	34.62	free
2NSH 150 4000	1.5	2.30	40.00	1.44	15	80	4	41.46	42.90	44.45	free	free
2NSH 160 800	1.6	2.40	8.00	1.55	15	45	4	8.36	8.65	8.96	9.30	10.06
2NSH 160 1000	1.6	2.40	10.00	1.55	15	45	4	10.43	10.79	11.18	11.60	12.54
2NSH 160 1200	1.6	2.40	12.00	1.55	15	45	4	12.50	12.93	13.40	13.90	15.03
2NSH 160 1400	1.6	2.40	14.00	1.55	15	45	4	14.56	15.07	15.61	16.20	17.52
2NSH 160 1600	1.6	2.40	16.00	1.55	15	50	4	16.63	17.21	17.83	18.50	20.00
2NSH 160 1800	1.6	2.40	18.00	1.55	15	50	4	18.70	19.35	20.05	20.80	22.49
2NSH 160 2000	1.6	2.40	20.00	1.55	15	50	4	20.76	21.49	22.26	23.10	free
2NSH 180 800	1.8	2.70	8.00	1.75	15	45	4	8.36	8.65	8.96	9.30	10.06
2NSH 180 1000	1.8	2.70	10.00	1.75	15	45	4	10.43	10.79	11.18	11.60	12.54
2NSH 180 1200	1.8	2.70	12.00	1.75	15	45	4	12.50	12.93	13.40	13.90	15.03
2NSH 180 1400	1.8	2.70	14.00	1.75	15	45	4	14.56	15.07	15.61	16.20	17.52
2NSH 180 1600	1.8	2.70	16.00	1.75	15	50	4	16.63	17.21	17.83	18.50	20.00
2NSH 180 1800	1.8	2.70	18.00	1.75	15	50	4	18.70	19.35	20.05	20.80	free
2NSH 180 2000	1.8	2.70	20.00	1.75	15	50	4	20.76	21.49	22.26	23.10	free
2NSH 200 400	2	3.00	4.00	1.92	15	45	4	4.28	4.43	4.59	4.77	5.15
2NSH 200 600	2	3.00	6.00	1.92	15	45	4	6.35	6.57	6.81	7.07	7.64
2NSH 200 800	2	3.00	8.00	1.92	15	45	4	8.42	8.71	9.03	9.37	10.13
2NSH 200 1000	2	3.00	10.00	1.92	15	45	4	10.49	10.85	11.24	11.67	12.61
2NSH 200 1200	2	3.00	12.00	1.92	15	45	4	12.55	12.99	13.46	13.96	15.10
2NSH 200 1400	2	3.00	14.00	1.92	15	45	4	14.62	15.13	15.68	16.26	17.58
2NSH 200 1600	2	3.00	16.00	1.92	15	50	4	16.69	17.27	17.89	18.56	free
2NSH 200 1800	2	3.00	18.00	1.92	15	50	4	18.76	19.41	20.11	20.86	free
2NSH 200 2000	2	3.00	20.00	1.92	15	50	4	20.82	21.55	22.33	23.16	free
2NSH 200 2500	2	3.00	25.00	1.92	15	60	4	25.99	26.90	27.87	free	free
2NSH 200 3000	2	3.00	30.00	1.92	15	70	4	31.16	32.25	33.41	free	free
2NSH 200 4000	2	3.00	40.00	1.92	15	80	4	41.50	42.94	free	free	free
2NSH 250 1000	2.5	3.70	10.00	2.39	15	45	4	10.54	10.91	11.31	11.73	12.68
2NSH 250 1200	2.5	3.70	12.00	2.39	15	45	4	12.61	13.05	13.52	14.03	free
2NSH 250 1600	2.5	3.70	16.00	2.39	15	50	4	16.75	17.33	17.96	18.63	free
2NSH 250 2000	2.5	3.70	20.00	2.39	15	50	4	20.88	21.61	22.39	free	free
2NSH 250 2500	2.5	3.70	25.00	2.39	15	60	4	26.05	26.96	27.93	free	free
2NSH 250 3000	2.5	3.70	30.00	2.39	15	70	4	31.22	32.31	free	free	free
2NSH 300 800	3	4.50	8.00	2.86	15	50	6	8.53	8.83	9.15	9.49	10.26
2NSH 300 1000	3	4.50	10.00	2.86	15	50	6	10.60	10.97	11.37	11.79	12.75
2NSH 300 1200	3	4.50	12.00	2.86	15	50	6	12.67	13.11	13.58	14.09	15.24
2NSH 300 1600	3	4.50	16.00	2.86	15	60	6	16.80	17.39	18.02	18.69	20.21
2NSH 300 2000	3	4.50	20.00	2.86	15	60	6	20.94	21.67	22.45	23.29	25.18
2NSH 300 2500	3	4.50	25.00	2.86	15	60	6	26.11	27.02	27.99	29.04	free
2NSH 300 3000	3	4.50	30.00	2.86	15	70	6	31.28	32.36	33.53	34.79	free
2NSH 300 3500	3	4.50	35.00	2.86	15	70	6	36.44	37.71	39.08	40.54	free
2NSH 300 4000	3	4.50	40.00	2.86	15	80	6	41.61	43.06	44.62	free	free

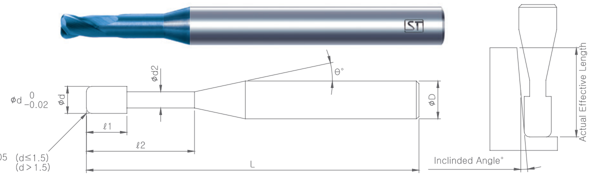
2날 평 리브-초고경도용
2F Necked Square End for Super Hardened Steels
2NSH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle ⊖°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NSH 400 1200	4	6.00	12.00	3.80	15	50	6	12.78	13.23	13.71	14.22	15.38
2NSH 400 1400	4	6.00	14.00	3.80	15	50	6	14.85	15.37	15.93	16.52	17.86
2NSH 400 1600	4	6.00	16.00	3.80	15	60	6	16.92	17.51	18.14	18.82	free
2NSH 400 2000	4	6.00	20.00	3.80	15	60	6	21.05	21.79	22.57	23.42	free
2NSH 400 2500	4	6.00	25.00	3.80	15	60	6	26.22	27.14	28.12	free	free
2NSH 400 3000	4	6.00	30.00	3.80	15	70	6	31.39	32.48	33.66	free	free
2NSH 400 3500	4	6.00	35.00	3.80	15	70	6	36.56	37.83	free	free	free
2NSH 400 4000	4	6.00	40.00	3.80	15	80	6	41.73	43.18	free	free	free
2NSH 400 5000	4	6.00	50.00	3.80	15	100	6	52.06	53.88	free	free	free
2NSH 500 1600	5	7.50	16.00	4.75	15	60	6	17.02	17.61	18.25	free	free
2NSH 500 2000	5	7.50	20.00	4.75	15	60	6	21.15	21.89	free	free	free
2NSH 500 2500	5	7.50	25.00	4.75	15	60	6	26.32	27.24	free	free	free
2NSH 500 3000	5	7.50	30.00	4.75	15	70	6	31.49	free	free	free	free
2NSH 500 3500	5	7.50	35.00	4.75	15	70	6	36.66	free	free	free	free
2NSH 500 4000	5	7.50	40.00	4.75	15	80	6	41.82	free	free	free	free
2NSH 500 5000	5	7.50	50.00	4.75	15	100	6	52.16	free	free	free	free
2NSH 600 1500	6	9.00	15.00	5.70	-	60	6	free	free	free	free	free
2NSH 600 2000	6	9.00	20.00	5.70	-	60	6	free	free	free	free	free
2NSH 600 3000	6	9.00	30.00	5.70	-	70	6	free	free	free	free	free
2NSH 600 4000	6	9.00	40.00	5.70	-	80	6	free	free	free	free	free
2NSH 800 2000	8	12.00	20.00	7.60	-	80	8	free	free	free	free	free
2NSH 800 3000	8	12.00	30.00	7.60	-	80	8	free	free	free	free	free
2NSH 800 4000	8	12.00	40.00	7.60	-	100	8	free	free	free	free	free

2날 코너 R 리브-초고경도용
2F Necked Corner Radius for Super Hardened Steels
2NCH

2 | HX30° | M/G Carbide | S-HC Coated



Features

- Extended neck style for long reach applications
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- A highly-wear resistant nanocomposite coating for oxidation resistance and extreme hardness
- Cutting geometry specifically engineered for super hardened steels
- Improved workpiece surface quality

특징

- 롱 넥 형상으로 깊은 가공에 적합함
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 고 내마모성의 나노컴포지트 코팅으로 내열성이 좋고 고경도소재의 가공에 적합함
- 절삭날의 치수와 형상은 초고경도 소재 가공에 최적화됨
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NCH 020 R002 050	0.2 X R0.02	0.15	0.50	0.18	15	45	4	0.55	0.57	0.59	0.61	0.66
2NCH 020 R002 100	0.2 X R0.02	0.15	1.00	0.18	15	45	4	1.07	1.10	1.14	1.18	1.28
2NCH 020 R002 200	0.2 X R0.02	0.15	2.00	0.18	15	45	4	2.10	2.17	2.25	2.33	2.52
2NCH 020 R005 050	0.2 X R0.05	0.15	0.50	0.18	15	45	4	0.55	0.57	0.59	0.61	0.65
2NCH 020 R005 100	0.2 X R0.05	0.15	1.00	0.18	15	45	4	1.07	1.10	1.14	1.18	1.27
2NCH 020 R005 150	0.2 X R0.05	0.15	1.50	0.18	15	45	4	1.58	1.64	1.69	1.76	1.89
2NCH 020 R005 200	0.2 X R0.05	0.15	2.00	0.18	15	45	4	2.10	2.17	2.25	2.33	2.52
2NCH 030 R002 100	0.3 X R0.02	0.25	1.00	0.28	15	45	4	1.07	1.10	1.14	1.18	1.28
2NCH 030 R002 200	0.3 X R0.02	0.25	2.00	0.28	15	45	4	2.10	2.17	2.25	2.33	2.52
2NCH 030 R002 300	0.3 X R0.02	0.25	3.00	0.28	15	45	4	3.13	3.24	3.36	3.48	3.77
2NCH 030 R005 100	0.3 X R0.05	0.25	1.00	0.28	15	45	4	1.07	1.10	1.14	1.18	1.27
2NCH 030 R005 150	0.3 X R0.05	0.25	1.50	0.28	15	45	4	1.58	1.64	1.69	1.76	1.89
2NCH 030 R005 200	0.3 X R0.05	0.25	2.00	0.28	15	45	4	2.10	2.17	2.25	2.33	2.52
2NCH 030 R005 250	0.3 X R0.05	0.25	2.50	0.28	15	45	4	2.62	2.71	2.80	2.91	3.14
2NCH 030 R005 300	0.3 X R0.05	0.25	3.00	0.28	15	45	4	3.13	3.24	3.36	3.48	3.76
2NCH 040 R002 100	0.4 X R0.02	0.30	1.00	0.37	15	45	4	1.09	1.12	1.16	1.21	1.30
2NCH 040 R002 200	0.4 X R0.02	0.30	2.00	0.37	15	45	4	2.12	2.19	2.27	2.36	2.55
2NCH 040 R002 300	0.4 X R0.02	0.30	3.00	0.37	15	45	4	3.15	3.26	3.38	3.51	3.79
2NCH 040 R002 400	0.4 X R0.02	0.30	4.00	0.37	15	45	4	4.19	4.33	4.49	4.66	5.03
2NCH 040 R005 100	0.4 X R0.05	0.30	1.00	0.37	15	45	4	1.08	1.12	1.16	1.20	1.30

2날 코너 R 리브-초고경도용
2F Necked Corner Radius for Super Hardened Steels
2NCH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NCH 040 R005 200	0.4 X R0.05	0.30	2.00	0.37	15	45	4	2.12	2.19	2.27	2.35	2.54
2NCH 040 R005 300	0.4 X R0.05	0.30	3.00	0.37	15	45	4	3.15	3.26	3.38	3.50	3.78
2NCH 040 R005 400	0.4 X R0.05	0.30	4.00	0.37	15	45	4	4.19	4.33	4.48	4.65	5.03
2NCH 040 R010 100	0.4 X R0.1	0.30	1.00	0.37	15	45	4	1.08	1.12	1.15	1.19	1.28
2NCH 040 R010 200	0.4 X R0.1	0.30	2.00	0.37	15	45	4	2.12	2.19	2.26	2.34	2.53
2NCH 040 R010 300	0.4 X R0.1	0.30	3.00	0.37	15	45	4	3.15	3.26	3.37	3.49	3.77
2NCH 040 R010 400	0.4 X R0.1	0.30	4.00	0.37	15	45	4	4.18	4.33	4.48	4.64	5.01
2NCH 050 R002 100	0.5 X R0.02	0.40	1.00	0.47	15	45	4	1.09	1.12	1.16	1.21	1.30
2NCH 050 R002 200	0.5 X R0.02	0.40	2.00	0.47	15	45	4	2.12	2.19	2.27	2.36	2.55
2NCH 050 R002 300	0.5 X R0.02	0.40	3.00	0.47	15	45	4	3.15	3.26	3.38	3.51	3.79
2NCH 050 R002 400	0.5 X R0.02	0.40	4.00	0.47	15	45	4	4.19	4.33	4.49	4.66	5.03
2NCH 050 R002 500	0.5 X R0.02	0.40	5.00	0.47	15	45	4	5.22	5.40	5.60	5.81	6.28
2NCH 050 R005 100	0.5 X R0.05	0.40	1.00	0.47	15	45	4	1.08	1.12	1.16	1.20	1.30
2NCH 050 R005 200	0.5 X R0.05	0.40	2.00	0.47	15	45	4	2.12	2.19	2.27	2.35	2.54
2NCH 050 R005 300	0.5 X R0.05	0.40	3.00	0.47	15	45	4	3.15	3.26	3.38	3.50	3.78
2NCH 050 R005 400	0.5 X R0.05	0.40	4.00	0.47	15	45	4	4.19	4.33	4.48	4.65	5.03
2NCH 050 R005 500	0.5 X R0.05	0.40	5.00	0.47	15	45	4	5.22	5.40	5.59	5.80	6.27
2NCH 050 R010 100	0.5 X R0.1	0.40	1.00	0.47	15	45	4	1.08	1.12	1.15	1.19	1.28
2NCH 050 R010 200	0.5 X R0.1	0.40	2.00	0.47	15	45	4	2.12	2.19	2.26	2.34	2.53
2NCH 050 R010 300	0.5 X R0.1	0.40	3.00	0.47	15	45	4	3.15	3.26	3.37	3.49	3.77
2NCH 050 R010 400	0.5 X R0.1	0.40	4.00	0.47	15	45	4	4.18	4.33	4.48	4.64	5.01
2NCH 050 R010 500	0.5 X R0.1	0.40	5.00	0.47	15	45	4	5.22	5.40	5.59	5.79	6.26
2NCH 060 R002 200	0.6 X R0.02	0.50	2.00	0.57	15	45	4	2.12	2.19	2.27	2.36	2.55
2NCH 060 R002 400	0.6 X R0.02	0.50	4.00	0.57	15	45	4	4.19	4.33	4.49	4.66	5.03
2NCH 060 R002 600	0.6 X R0.02	0.50	6.00	0.57	15	45	4	6.25	6.47	6.70	6.96	7.52
2NCH 060 R005 200	0.6 X R0.05	0.50	2.00	0.57	15	45	4	2.12	2.19	2.27	2.35	2.54
2NCH 060 R005 400	0.6 X R0.05	0.50	4.00	0.57	15	45	4	4.19	4.33	4.48	4.65	5.03
2NCH 060 R005 600	0.6 X R0.05	0.50	6.00	0.57	15	45	4	6.25	6.47	6.70	6.95	7.51
2NCH 060 R010 200	0.6 X R0.1	0.50	2.00	0.57	15	45	4	2.12	2.19	2.26	2.34	2.53
2NCH 060 R010 400	0.6 X R0.1	0.50	4.00	0.57	15	45	4	4.18	4.33	4.48	4.64	5.01
2NCH 060 R010 600	0.6 X R0.1	0.50	6.00	0.57	15	45	4	6.25	6.47	6.70	6.94	7.50
2NCH 070 R005 400	0.7 X R0.05	0.55	4.00	0.66	15	45	4	4.21	4.35	4.51	4.67	5.05
2NCH 070 R005 600	0.7 X R0.05	0.55	6.00	0.66	15	45	4	6.27	6.49	6.72	6.97	7.53
2NCH 070 R010 400	0.7 X R0.1	0.55	4.00	0.66	15	45	4	4.20	4.35	4.50	4.67	5.04
2NCH 070 R010 600	0.7 X R0.1	0.55	6.00	0.66	15	45	4	6.27	6.49	6.72	6.96	7.52
2NCH 080 R002 200	0.8 X R0.02	0.65	2.00	0.77	15	45	4	2.12	2.19	2.27	2.36	2.55
2NCH 080 R002 400	0.8 X R0.02	0.65	4.00	0.77	15	45	4	4.19	4.33	4.49	4.66	5.03
2NCH 080 R002 600	0.8 X R0.02	0.65	6.00	0.77	15	45	4	6.25	6.47	6.70	6.96	7.52
2NCH 080 R002 800	0.8 X R0.02	0.65	8.00	0.77	15	45	4	8.32	8.61	8.92	9.26	10.00
2NCH 080 R005 200	0.8 X R0.05	0.65	2.00	0.77	15	45	4	2.12	2.19	2.27	2.35	2.54
2NCH 080 R005 400	0.8 X R0.05	0.65	4.00	0.77	15	45	4	4.19	4.33	4.48	4.65	5.03
2NCH 080 R005 600	0.8 X R0.05	0.65	6.00	0.77	15	45	4	6.25	6.47	6.70	6.95	7.51
2NCH 080 R005 800	0.8 X R0.05	0.65	8.00	0.77	15	45	4	8.32	8.61	8.92	9.25	10.00

2날 코너 R 리브-초고경도용
2F Necked Corner Radius for Super Hardened Steels
2NCH

For Super Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle ⊖°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
2NCH 080 R010 200	0.8 X R0.1	0.65	2.00	0.77	15	45	4	2.12	2.19	2.26	2.34	2.53
2NCH 080 R010 400	0.8 X R0.1	0.65	4.00	0.77	15	45	4	4.18	4.33	4.48	4.64	5.01
2NCH 080 R010 600	0.8 X R0.1	0.65	6.00	0.77	15	45	4	6.25	6.47	6.70	6.94	7.50
2NCH 080 R010 800	0.8 X R0.1	0.65	8.00	0.77	15	45	4	8.32	8.61	8.91	9.24	9.99
2NCH 080 R020 200	0.8 X R0.2	0.65	2.00	0.77	15	45	4	2.11	2.18	2.25	2.33	2.50
2NCH 080 R020 400	0.8 X R0.2	0.65	4.00	0.77	15	45	4	4.18	4.32	4.47	4.63	4.99
2NCH 080 R020 600	0.8 X R0.2	0.65	6.00	0.77	15	45	4	6.25	6.46	6.69	6.93	7.47
2NCH 080 R020 800	0.8 X R0.2	0.65	8.00	0.77	15	45	4	8.32	8.60	8.90	9.23	9.96
2NCH 090 R010 400	0.9 X R0.1	0.70	4.00	0.85	15	45	4	4.22	4.37	4.52	4.69	5.06
2NCH 090 R010 800	0.9 X R0.1	0.70	8.00	0.85	15	45	4	8.36	8.65	8.95	9.29	10.03
2NCH 100 R002 200	1.0 X R0.02	0.80	2.00	0.95	15	45	4	2.16	2.23	2.31	2.40	2.59
2NCH 100 R002 400	1.0 X R0.02	0.80	4.00	0.95	15	45	4	4.23	4.37	4.53	4.70	5.08
2NCH 100 R002 600	1.0 X R0.02	0.80	6.00	0.95	15	45	4	6.29	6.51	6.75	7.00	7.56
2NCH 100 R002 800	1.0 X R0.02	0.80	8.00	0.95	15	45	4	8.36	8.65	8.96	9.30	10.05
2NCH 100 R002 1000	1.0 X R0.02	0.80	10.00	0.95	15	45	4	10.43	10.79	11.18	11.60	12.54
2NCH 100 R005 200	1.0 X R0.05	0.80	2.00	0.95	15	45	4	2.16	2.23	2.31	2.39	2.59
2NCH 100 R005 400	1.0 X R0.05	0.80	4.00	0.95	15	45	4	4.22	4.37	4.53	4.69	5.07
2NCH 100 R005 600	1.0 X R0.05	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.56
2NCH 100 R005 800	1.0 X R0.05	0.80	8.00	0.95	15	45	4	8.36	8.65	8.96	9.29	10.04
2NCH 100 R005 1000	1.0 X R0.05	0.80	10.00	0.95	15	45	4	10.43	10.79	11.18	11.59	12.53
2NCH 100 R005 1200	1.0 X R0.05	0.80	12.00	0.95	15	45	4	12.49	12.93	13.39	13.89	15.02
2NCH 100 R005 1600	1.0 X R0.05	0.80	16.00	0.95	15	50	4	16.63	17.21	17.83	18.49	19.99
2NCH 100 R005 2000	1.0 X R0.05	0.80	20.00	0.95	15	50	4	20.76	21.48	22.26	23.09	24.96
2NCH 100 R010 200	1.0 X R0.1	0.80	2.00	0.95	15	45	4	2.16	2.23	2.30	2.39	2.57
2NCH 100 R010 400	1.0 X R0.1	0.80	4.00	0.95	15	45	4	4.22	4.37	4.52	4.69	5.06
2NCH 100 R010 600	1.0 X R0.1	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.55
2NCH 100 R010 800	1.0 X R0.1	0.80	8.00	0.95	15	45	4	8.36	8.65	8.95	9.29	10.03
2NCH 100 R010 1000	1.0 X R0.1	0.80	10.00	0.95	15	45	4	10.42	10.78	11.17	11.59	12.52
2NCH 100 R010 1200	1.0 X R0.1	0.80	12.00	0.95	15	45	4	12.49	12.92	13.39	13.89	15.00
2NCH 100 R010 1600	1.0 X R0.1	0.80	16.00	0.95	15	50	4	16.63	17.20	17.82	18.48	19.98
2NCH 100 R010 2000	1.0 X R0.1	0.80	20.00	0.95	15	50	4	20.76	21.48	22.25	23.08	24.95
2NCH 100 R020 200	1.0 X R0.2	0.80	2.00	0.95	15	45	4	2.15	2.22	2.29	2.37	2.55
2NCH 100 R020 400	1.0 X R0.2	0.80	4.00	0.95	15	45	4	4.22	4.36	4.51	4.67	5.03
2NCH 100 R020 600	1.0 X R0.2	0.80	6.00	0.95	15	45	4	6.29	6.50	6.73	6.97	7.52
2NCH 100 R020 800	1.0 X R0.2	0.80	8.00	0.95	15	45	4	8.35	8.64	8.94	9.27	10.01
2NCH 100 R020 1000	1.0 X R0.2	0.80	10.00	0.95	15	45	4	10.42	10.78	11.16	11.57	12.49
2NCH 100 R020 1200	1.0 X R0.2	0.80	12.00	0.95	15	45	4	12.49	12.92	13.38	13.87	14.98
2NCH 100 R020 1600	1.0 X R0.2	0.80	16.00	0.95	15	50	4	16.62	17.20	17.81	18.47	19.95
2NCH 100 R020 2000	1.0 X R0.2	0.80	20.00	0.95	15	50	4	20.76	21.47	22.24	23.07	24.93
2NCH 100 R030 200	1.0 X R0.3	0.80	2.00	0.95	15	45	4	2.15	2.21	2.28	2.36	2.52
2NCH 100 R030 400	1.0 X R0.3	0.80	4.00	0.95	15	45	4	4.22	4.35	4.50	4.66	5.01
2NCH 100 R030 600	1.0 X R0.3	0.80	6.00	0.95	15	45	4	6.28	6.49	6.72	6.96	7.50
2NCH 100 R030 800	1.0 X R0.3	0.80	8.00	0.95	15	45	4	8.35	8.63	8.93	9.26	9.98

2날 코너 R 리브-초고경도용
2F Necked Corner Radius for Super Hardened Steels

2NCH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NCH 100 R030 1000	1.0 X R0.3	0.80	10.00	0.95	15	45	4	10.42	10.77	11.15	11.56	12.47
2NCH 100 R030 1200	1.0 X R0.3	0.80	12.00	0.95	15	45	4	12.49	12.91	13.37	13.86	14.96
2NCH 100 R030 1600	1.0 X R0.3	0.80	16.00	0.95	15	50	4	16.62	17.19	17.80	18.46	19.93
2NCH 100 R030 2000	1.0 X R0.3	0.80	20.00	0.95	15	50	4	20.75	21.47	22.23	23.05	24.90
2NCH 120 R010 400	1.2 X R0.1	1.00	4.00	1.14	15	45	4	4.24	4.39	4.54	4.71	5.08
2NCH 120 R010 600	1.2 X R0.1	1.00	6.00	1.14	15	45	4	6.31	6.53	6.76	7.01	7.57
2NCH 120 R010 1000	1.2 X R0.1	1.00	10.00	1.14	15	50	4	10.44	10.80	11.19	11.61	12.54
2NCH 120 R020 400	1.2 X R0.2	1.00	4.00	1.14	15	45	4	4.24	4.38	4.53	4.69	5.06
2NCH 120 R020 600	1.2 X R0.2	1.00	6.00	1.14	15	45	4	6.31	6.52	6.75	6.99	7.54
2NCH 120 R020 1000	1.2 X R0.2	1.00	10.00	1.14	15	50	4	10.44	10.80	11.18	11.59	12.52
2NCH 120 R030 400	1.2 X R0.3	1.00	4.00	1.14	15	45	4	4.24	4.37	4.52	4.68	5.03
2NCH 120 R030 600	1.2 X R0.3	1.00	6.00	1.14	15	45	4	6.30	6.51	6.74	6.98	7.52
2NCH 120 R030 1000	1.2 X R0.3	1.00	10.00	1.14	15	50	4	10.44	10.79	11.17	11.58	12.49
2NCH 150 R005 300	1.5 X R0.05	1.50	3.00	1.44	15	45	4	3.21	3.32	3.44	3.57	3.85
2NCH 150 R005 400	1.5 X R0.05	1.50	4.00	1.44	15	45	4	4.24	4.39	4.55	4.72	5.09
2NCH 150 R005 600	1.5 X R0.05	1.50	6.00	1.44	15	45	4	6.31	6.53	6.76	7.02	7.58
2NCH 150 R005 800	1.5 X R0.05	1.50	8.00	1.44	15	45	4	8.38	8.67	8.98	9.32	10.07
2NCH 150 R005 1000	1.5 X R0.05	1.50	10.00	1.44	15	45	4	10.45	10.81	11.20	11.61	12.55
2NCH 150 R005 1200	1.5 X R0.05	1.50	12.00	1.44	15	45	4	12.51	12.95	13.41	13.91	15.04
2NCH 150 R005 1600	1.5 X R0.05	1.50	16.00	1.44	15	50	4	16.65	17.23	17.85	18.51	20.01
2NCH 150 R005 2000	1.5 X R0.05	1.50	20.00	1.44	15	50	4	20.78	21.50	22.28	23.11	free
2NCH 150 R010 300	1.5 X R0.1	1.50	3.00	1.44	15	45	4	3.21	3.32	3.43	3.56	3.84
2NCH 150 R010 400	1.5 X R0.1	1.50	4.00	1.44	15	45	4	4.24	4.39	4.54	4.71	5.08
2NCH 150 R010 600	1.5 X R0.1	1.50	6.00	1.44	15	45	4	6.31	6.53	6.76	7.01	7.57
2NCH 150 R010 800	1.5 X R0.1	1.50	8.00	1.44	15	45	4	8.38	8.67	8.97	9.31	10.06
2NCH 150 R010 1000	1.5 X R0.1	1.50	10.00	1.44	15	45	4	10.44	10.80	11.19	11.61	12.54
2NCH 150 R010 1200	1.5 X R0.1	1.50	12.00	1.44	15	45	4	12.51	12.94	13.41	13.91	15.03
2NCH 150 R010 1600	1.5 X R0.1	1.50	16.00	1.44	15	50	4	16.65	17.22	17.84	18.51	20.00
2NCH 150 R010 2000	1.5 X R0.1	1.50	20.00	1.44	15	50	4	20.78	21.50	22.27	23.11	free
2NCH 150 R020 300	1.5 X R0.2	1.50	3.00	1.44	15	45	4	3.20	3.31	3.42	3.54	3.81
2NCH 150 R020 400	1.5 X R0.2	1.50	4.00	1.44	15	45	4	4.24	4.38	4.53	4.69	5.06
2NCH 150 R020 600	1.5 X R0.2	1.50	6.00	1.44	15	45	4	6.31	6.52	6.75	6.99	7.54
2NCH 150 R020 800	1.5 X R0.2	1.50	8.00	1.44	15	45	4	8.37	8.66	8.96	9.29	10.03
2NCH 150 R020 1000	1.5 X R0.2	1.50	10.00	1.44	15	45	4	10.44	10.80	11.18	11.59	12.52
2NCH 150 R020 1200	1.5 X R0.2	1.50	12.00	1.44	15	45	4	12.51	12.94	13.40	13.89	15.00
2NCH 150 R020 1600	1.5 X R0.2	1.50	16.00	1.44	15	50	4	16.64	17.22	17.83	18.49	19.98
2NCH 150 R020 2000	1.5 X R0.2	1.50	20.00	1.44	15	50	4	20.78	21.49	22.26	23.09	free
2NCH 150 R030 300	1.5 X R0.3	1.50	3.00	1.44	15	45	4	3.20	3.30	3.41	3.53	3.79
2NCH 150 R030 400	1.5 X R0.3	1.50	4.00	1.44	15	45	4	4.24	4.37	4.52	4.68	5.03
2NCH 150 R030 600	1.5 X R0.3	1.50	6.00	1.44	15	45	4	6.30	6.51	6.74	6.98	7.52
2NCH 150 R030 800	1.5 X R0.3	1.50	8.00	1.44	15	45	4	8.37	8.65	8.95	9.28	10.01
2NCH 150 R030 1000	1.5 X R0.3	1.50	10.00	1.44	15	45	4	10.44	10.79	11.17	11.58	12.49
2NCH 150 R030 1200	1.5 X R0.3	1.50	12.00	1.44	15	45	4	12.50	12.93	13.39	13.88	14.98

2날 코너 R 리브-초고경도용

2F Necked Corner Radius for Super Hardened Steels

2NCH

For Super Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle ⊖°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
2NCH 150 R030 1600	1.5 X R0.3	1.50	16.00	1.44	15	50	4	16.64	17.21	17.82	18.48	19.95
2NCH 150 R030 2000	1.5 X R0.3	1.50	20.00	1.44	15	50	4	20.77	21.49	22.25	23.08	free
2NCH 150 R050 300	1.5 X R0.5	1.50	3.00	1.44	15	45	4	3.19	3.29	3.39	3.50	3.74
2NCH 150 R050 400	1.5 X R0.5	1.50	4.00	1.44	15	45	4	4.23	4.36	4.50	4.65	4.99
2NCH 150 R050 600	1.5 X R0.5	1.50	6.00	1.44	15	45	4	6.30	6.50	6.71	6.95	7.47
2NCH 150 R050 800	1.5 X R0.5	1.50	8.00	1.44	15	45	4	8.36	8.64	8.93	9.25	9.96
2NCH 150 R050 1000	1.5 X R0.5	1.50	10.00	1.44	15	45	4	10.43	10.78	11.15	11.55	12.44
2NCH 150 R050 1200	1.5 X R0.5	1.50	12.00	1.44	15	45	4	12.50	12.92	13.36	13.85	14.93
2NCH 150 R050 1600	1.5 X R0.5	1.50	16.00	1.44	15	50	4	16.63	17.19	17.80	18.45	19.90
2NCH 150 R050 2000	1.5 X R0.5	1.50	20.00	1.44	15	50	4	20.77	21.47	22.23	23.05	free
2NCH 200 R005 400	2.0 X R0.05	1.70	4.00	1.92	15	45	4	4.28	4.43	4.59	4.76	5.14
2NCH 200 R005 600	2.0 X R0.05	1.70	6.00	1.92	15	45	4	6.35	6.57	6.80	7.06	7.63
2NCH 200 R005 800	2.0 X R0.05	1.70	8.00	1.92	15	45	4	8.42	8.71	9.02	9.36	10.11
2NCH 200 R005 1000	2.0 X R0.05	1.70	10.00	1.92	15	45	4	10.48	10.85	11.24	11.66	12.60
2NCH 200 R005 1200	2.0 X R0.05	1.70	12.00	1.92	15	45	4	12.55	12.99	13.45	13.96	15.09
2NCH 200 R005 1600	2.0 X R0.05	1.70	16.00	1.92	15	50	4	16.69	17.27	17.89	18.56	free
2NCH 200 R005 2000	2.0 X R0.05	1.70	20.00	1.92	15	50	4	20.82	21.54	22.32	23.16	free
2NCH 200 R010 400	2.0 X R0.1	1.70	4.00	1.92	15	45	4	4.28	4.43	4.58	4.75	5.13
2NCH 200 R010 600	2.0 X R0.1	1.70	6.00	1.92	15	45	4	6.35	6.57	6.80	7.05	7.62
2NCH 200 R010 800	2.0 X R0.1	1.70	8.00	1.92	15	45	4	8.42	8.71	9.02	9.35	10.10
2NCH 200 R010 1000	2.0 X R0.1	1.70	10.00	1.92	15	45	4	10.48	10.84	11.23	11.65	12.59
2NCH 200 R010 1200	2.0 X R0.1	1.70	12.00	1.92	15	45	4	12.55	12.98	13.45	13.95	15.07
2NCH 200 R010 1600	2.0 X R0.1	1.70	16.00	1.92	15	50	4	16.68	17.26	17.88	18.55	free
2NCH 200 R010 2000	2.0 X R0.1	1.70	20.00	1.92	15	50	4	20.82	21.54	22.32	23.15	free
2NCH 200 R020 400	2.0 X R0.2	1.70	4.00	1.92	15	45	4	4.28	4.42	4.57	4.74	5.10
2NCH 200 R020 600	2.0 X R0.2	1.70	6.00	1.92	15	45	4	6.34	6.56	6.79	7.04	7.59
2NCH 200 R020 800	2.0 X R0.2	1.70	8.00	1.92	15	45	4	8.41	8.70	9.01	9.34	10.08
2NCH 200 R020 1000	2.0 X R0.2	1.70	10.00	1.92	15	45	4	10.48	10.84	11.22	11.64	12.56
2NCH 200 R020 1200	2.0 X R0.2	1.70	12.00	1.92	15	45	4	12.55	12.98	13.44	13.93	15.05
2NCH 200 R020 1600	2.0 X R0.2	1.70	16.00	1.92	15	50	4	16.68	17.26	17.87	18.53	free
2NCH 200 R020 2000	2.0 X R0.2	1.70	20.00	1.92	15	50	4	20.82	21.53	22.31	23.13	free
2NCH 200 R030 400	2.0 X R0.3	1.70	4.00	1.92	15	45	4	4.27	4.41	4.56	4.72	5.08
2NCH 200 R030 600	2.0 X R0.3	1.70	6.00	1.92	15	45	4	6.34	6.55	6.78	7.02	7.57
2NCH 200 R030 800	2.0 X R0.3	1.70	8.00	1.92	15	45	4	8.41	8.69	8.99	9.32	10.05
2NCH 200 R030 1000	2.0 X R0.3	1.70	10.00	1.92	15	45	4	10.48	10.83	11.21	11.62	12.54
2NCH 200 R030 1200	2.0 X R0.3	1.70	12.00	1.92	15	45	4	12.54	12.97	13.43	13.92	15.03
2NCH 200 R030 1600	2.0 X R0.3	1.70	16.00	1.92	15	50	4	16.68	17.25	17.86	18.52	free
2NCH 200 R030 2000	2.0 X R0.3	1.70	20.00	1.92	15	50	4	20.81	21.53	22.29	23.12	free
2NCH 200 R050 400	2.0 X R0.5	1.70	4.00	1.92	15	45	4	4.27	4.40	4.54	4.69	5.03
2NCH 200 R050 600	2.0 X R0.5	1.70	6.00	1.92	15	45	4	6.33	6.54	6.76	6.99	7.52
2NCH 200 R050 800	2.0 X R0.5	1.70	8.00	1.92	15	45	4	8.40	8.68	8.97	9.29	10.00
2NCH 200 R050 1000	2.0 X R0.5	1.70	10.00	1.92	15	45	4	10.47	10.82	11.19	11.59	12.49
2NCH 200 R050 1200	2.0 X R0.5	1.70	12.00	1.92	15	45	4	12.54	12.96	13.41	13.89	14.98

2날 코너 R 리브-초고경도용
2F Necked Corner Radius for Super Hardened Steels
2NCH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NCH 200 R050 1600	2.0 X R0.5	1.70	16.00	1.92	15	50	4	16.67	17.23	17.84	18.49	free
2NCH 200 R050 2000	2.0 X R0.5	1.70	20.00	1.92	15	50	4	20.81	21.51	22.27	23.09	free
2NCH 250 R010 1000	2.5 X R0.1	2.00	10.00	2.39	15	50	4	10.54	10.90	11.29	11.71	12.66
2NCH 250 R010 2000	2.5 X R0.1	2.00	20.00	2.39	15	60	4	20.88	21.60	22.38	free	free
2NCH 250 R010 3000	2.5 X R0.1	2.00	30.00	2.39	15	70	4	31.21	32.30	free	free	free
2NCH 250 R020 1000	2.5 X R0.2	2.00	10.00	2.39	15	50	4	10.54	10.90	11.28	11.70	12.63
2NCH 250 R020 2000	2.5 X R0.2	2.00	20.00	2.39	15	60	4	20.87	21.59	22.37	free	free
2NCH 250 R020 3000	2.5 X R0.2	2.00	30.00	2.39	15	70	4	31.21	32.29	free	free	free
2NCH 250 R030 1000	2.5 X R0.3	2.00	10.00	2.39	15	50	4	10.53	10.89	11.27	11.68	12.61
2NCH 250 R030 2000	2.5 X R0.3	2.00	20.00	2.39	15	60	4	20.87	21.59	22.36	free	free
2NCH 250 R030 3000	2.5 X R0.3	2.00	30.00	2.39	15	70	4	31.21	32.28	free	free	free
2NCH 250 R050 1000	2.5 X R0.5	2.00	10.00	2.39	15	50	4	10.53	10.88	11.25	11.65	12.56
2NCH 250 R050 2000	2.5 X R0.5	2.00	20.00	2.39	15	60	4	20.86	21.57	22.33	free	free
2NCH 250 R050 3000	2.5 X R0.5	2.00	30.00	2.39	15	70	4	31.20	32.27	free	free	free
2NCH 300 R005 400	3.0 X R0.05	2.50	4.00	2.86	15	50	6	4.40	4.55	4.71	4.89	5.28
2NCH 300 R005 600	3.0 X R0.05	2.50	6.00	2.86	15	50	6	6.47	6.69	6.93	7.19	7.77
2NCH 300 R005 800	3.0 X R0.05	2.50	8.00	2.86	15	50	6	8.53	8.83	9.15	9.49	10.25
2NCH 300 R005 1000	3.0 X R0.05	2.50	10.00	2.86	15	50	6	10.60	10.97	11.36	11.79	12.74
2NCH 300 R005 1200	3.0 X R0.05	2.50	12.00	2.86	15	50	6	12.67	13.11	13.58	14.09	15.23
2NCH 300 R005 1600	3.0 X R0.05	2.50	16.00	2.86	15	60	6	16.80	17.39	18.01	18.69	20.20
2NCH 300 R005 2000	3.0 X R0.05	2.50	20.00	2.86	15	60	6	20.94	21.66	22.45	23.29	25.17
2NCH 300 R010 400	3.0 X R0.1	2.50	4.00	2.86	15	50	6	4.40	4.55	4.71	4.88	5.27
2NCH 300 R010 600	3.0 X R0.1	2.50	6.00	2.86	15	50	6	6.46	6.69	6.92	7.18	7.75
2NCH 300 R010 800	3.0 X R0.1	2.50	8.00	2.86	15	50	6	8.53	8.82	9.14	9.48	10.24
2NCH 300 R010 1000	3.0 X R0.1	2.50	10.00	2.86	15	50	6	10.60	10.96	11.36	11.78	12.73
2NCH 300 R010 1200	3.0 X R0.1	2.50	12.00	2.86	15	50	6	12.67	13.10	13.57	14.08	15.21
2NCH 300 R010 1600	3.0 X R0.1	2.50	16.00	2.86	15	60	6	16.80	17.38	18.01	18.68	20.19
2NCH 300 R010 2000	3.0 X R0.1	2.50	20.00	2.86	15	60	6	20.93	21.66	22.44	23.28	25.16
2NCH 300 R010 2500	3.0 X R0.1	2.50	25.00	2.86	15	60	6	26.10	27.01	27.98	29.03	free
2NCH 300 R010 3000	3.0 X R0.1	2.50	30.00	2.86	15	70	6	31.27	32.36	33.52	34.78	free
2NCH 300 R010 3500	3.0 X R0.1	2.50	35.00	2.86	15	75	6	36.44	37.71	39.06	40.53	free
2NCH 300 R020 400	3.0 X R0.2	2.50	4.00	2.86	15	50	6	4.39	4.54	4.70	4.86	5.24
2NCH 300 R020 600	3.0 X R0.2	2.50	6.00	2.86	15	50	6	6.46	6.68	6.91	7.16	7.73
2NCH 300 R020 800	3.0 X R0.2	2.50	8.00	2.86	15	50	6	8.53	8.82	9.13	9.46	10.22
2NCH 300 R020 1000	3.0 X R0.2	2.50	10.00	2.86	15	50	6	10.59	10.96	11.35	11.76	12.70
2NCH 300 R020 1200	3.0 X R0.2	2.50	12.00	2.86	15	50	6	12.66	13.10	13.56	14.06	15.19
2NCH 300 R020 1600	3.0 X R0.2	2.50	16.00	2.86	15	60	6	16.80	17.38	18.00	18.66	20.16
2NCH 300 R020 2000	3.0 X R0.2	2.50	20.00	2.86	15	60	6	20.93	21.65	22.43	23.26	25.13
2NCH 300 R020 2500	3.0 X R0.2	2.50	25.00	2.86	15	60	6	26.10	27.00	27.97	29.01	free
2NCH 300 R020 3000	3.0 X R0.2	2.50	30.00	2.86	15	70	6	31.27	32.35	33.51	34.76	free
2NCH 300 R020 3500	3.0 X R0.2	2.50	35.00	2.86	15	75	6	36.44	37.70	39.05	40.51	free
2NCH 300 R030 400	3.0 X R0.3	2.50	4.00	2.86	15	50	6	4.39	4.53	4.69	4.85	5.22
2NCH 300 R030 600	3.0 X R0.3	2.50	6.00	2.86	15	50	6	6.46	6.67	6.90	7.15	7.71

2날 코너 R 리브-초고경도용
2F Necked Corner Radius for Super Hardened Steels

2NCH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
2NCH 300 R030 800	3.0 X R0.3	2.50	8.00	2.86	15	50	6	8.52	8.81	9.12	9.45	10.19
2NCH 300 R030 1000	3.0 X R0.3	2.50	10.00	2.86	15	50	6	10.59	10.95	11.34	11.75	12.68
2NCH 300 R030 1200	3.0 X R0.3	2.50	12.00	2.86	15	50	6	12.66	13.09	13.55	14.05	15.16
2NCH 300 R030 1600	3.0 X R0.3	2.50	16.00	2.86	15	60	6	16.79	17.37	17.99	18.65	20.14
2NCH 300 R030 2000	3.0 X R0.3	2.50	20.00	2.86	15	60	6	20.93	21.65	22.42	23.25	25.11
2NCH 300 R030 2500	3.0 X R0.3	2.50	25.00	2.86	15	60	6	26.10	27.00	27.96	29.00	free
2NCH 300 R030 3000	3.0 X R0.3	2.50	30.00	2.86	15	70	6	31.26	32.34	33.50	34.75	free
2NCH 300 R030 3500	3.0 X R0.3	2.50	35.00	2.86	15	75	6	36.43	37.69	39.04	40.50	free
2NCH 300 R050 400	3.0 X R0.5	2.50	4.00	2.86	15	50	6	4.38	4.52	4.66	4.82	5.17
2NCH 300 R050 600	3.0 X R0.5	2.50	6.00	2.86	15	50	6	6.45	6.66	6.88	7.12	7.66
2NCH 300 R050 800	3.0 X R0.5	2.50	8.00	2.86	15	50	6	8.52	8.80	9.10	9.42	10.14
2NCH 300 R050 1000	3.0 X R0.5	2.50	10.00	2.86	15	50	6	10.58	10.94	11.31	11.72	12.63
2NCH 300 R050 1200	3.0 X R0.5	2.50	12.00	2.86	15	50	6	12.65	13.08	13.53	14.02	15.12
2NCH 300 R050 1600	3.0 X R0.5	2.50	16.00	2.86	15	60	6	16.79	17.35	17.96	18.62	20.09
2NCH 300 R050 2000	3.0 X R0.5	2.50	20.00	2.86	15	60	6	20.92	21.63	22.40	23.22	25.06
2NCH 300 R050 2500	3.0 X R0.5	2.50	25.00	2.86	15	60	6	26.09	26.98	27.94	28.97	free
2NCH 300 R050 3000	3.0 X R0.5	2.50	30.00	2.86	15	70	6	31.26	32.33	33.48	34.72	free
2NCH 300 R050 3500	3.0 X R0.5	2.50	35.00	2.86	15	75	6	36.43	37.68	39.02	40.47	free
2NCH 300 R100 800	3.0 X R1.0	2.50	8.00	2.86	15	50	6	8.50	8.76	9.04	9.34	10.02
2NCH 300 R100 1000	3.0 X R1.0	2.50	10.00	2.86	15	50	6	10.57	10.90	11.26	11.64	12.51
2NCH 300 R100 1200	3.0 X R1.0	2.50	12.00	2.86	15	50	6	12.64	13.04	13.48	13.94	14.99
2NCH 300 R100 1600	3.0 X R1.0	2.50	16.00	2.86	15	60	6	16.77	17.32	17.91	18.54	19.97
2NCH 300 R100 2000	3.0 X R1.0	2.50	20.00	2.86	15	60	6	20.90	21.60	22.34	23.14	24.94
2NCH 300 R100 2500	3.0 X R1.0	2.50	25.00	2.86	15	60	6	26.07	26.95	27.88	28.89	free
2NCH 300 R100 3000	3.0 X R1.0	2.50	30.00	2.86	15	70	6	31.24	32.30	33.43	34.64	free
2NCH 300 R100 3500	3.0 X R1.0	2.50	35.00	2.86	15	75	6	36.41	37.64	38.97	40.39	free
2NCH 400 R010 800	4.0 X R0.1	3.50	8.00	3.80	15	50	6	8.65	8.94	9.26	9.61	10.38
2NCH 400 R010 1000	4.0 X R0.1	3.50	10.00	3.80	15	50	6	10.71	11.08	11.48	11.91	12.87
2NCH 400 R010 1200	4.0 X R0.1	3.50	12.00	3.80	15	50	6	12.78	13.22	13.70	14.21	15.35
2NCH 400 R010 1600	4.0 X R0.1	3.50	16.00	3.80	15	60	6	16.92	17.50	18.13	18.81	free
2NCH 400 R010 2000	4.0 X R0.1	3.50	20.00	3.80	15	60	6	21.05	21.78	22.56	23.41	free
2NCH 400 R010 2500	4.0 X R0.1	3.50	25.00	3.80	15	60	6	26.22	27.13	28.11	free	free
2NCH 400 R010 3000	4.0 X R0.1	3.50	30.00	3.80	15	70	6	31.39	32.48	33.65	free	free
2NCH 400 R010 4000	4.0 X R0.1	3.50	40.00	3.80	15	80	6	41.72	43.17	free	free	free
2NCH 400 R020 800	4.0 X R0.2	3.50	8.00	3.80	15	50	6	8.64	8.94	9.25	9.59	10.36
2NCH 400 R020 1000	4.0 X R0.2	3.50	10.00	3.80	15	50	6	10.71	11.08	11.47	11.89	12.84
2NCH 400 R020 1200	4.0 X R0.2	3.50	12.00	3.80	15	50	6	12.78	13.22	13.69	14.19	15.33
2NCH 400 R020 1600	4.0 X R0.2	3.50	16.00	3.80	15	60	6	16.91	17.50	18.12	18.79	free
2NCH 400 R020 2000	4.0 X R0.2	3.50	20.00	3.80	15	60	6	21.05	21.77	22.55	23.39	free
2NCH 400 R020 2500	4.0 X R0.2	3.50	25.00	3.80	15	60	6	26.22	27.12	28.09	free	free
2NCH 400 R020 3000	4.0 X R0.2	3.50	30.00	3.80	15	70	6	31.38	32.47	33.64	free	free
2NCH 400 R020 4000	4.0 X R0.2	3.50	40.00	3.80	15	80	6	41.72	43.17	free	free	free
2NCH 400 R030 800	4.0 X R0.3	3.50	8.00	3.80	15	50	6	8.64	8.93	9.24	9.58	10.33

2날 코너 R 리브-초고경도용
2F Necked Corner Radius for Super Hardened Steels
2NCH

For Super Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	섕크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NCH 400 R030 1000	4.0 X R0.3	3.50	10.00	3.80	15	50	6	10.71	11.07	11.46	11.88	12.82
2NCH 400 R030 1200	4.0 X R0.3	3.50	12.00	3.80	15	50	6	12.77	13.21	13.68	14.18	15.30
2NCH 400 R030 1600	4.0 X R0.3	3.50	16.00	3.80	15	60	6	16.91	17.49	18.11	18.78	free
2NCH 400 R030 2000	4.0 X R0.3	3.50	20.00	3.80	15	60	6	21.04	21.77	22.54	23.38	free
2NCH 400 R030 2500	4.0 X R0.3	3.50	25.00	3.80	15	60	6	26.21	27.12	28.08	free	free
2NCH 400 R030 3000	4.0 X R0.3	3.50	30.00	3.80	15	70	6	31.38	32.46	33.63	free	free
2NCH 400 R030 4000	4.0 X R0.3	3.50	40.00	3.80	15	80	6	41.72	43.16	free	free	free
2NCH 400 R050 800	4.0 X R0.5	3.50	8.00	3.80	15	50	6	8.63	8.92	9.22	9.55	10.28
2NCH 400 R050 1000	4.0 X R0.5	3.50	10.00	3.80	15	50	6	10.70	11.06	11.44	11.85	12.77
2NCH 400 R050 1200	4.0 X R0.5	3.50	12.00	3.80	15	50	6	12.77	13.20	13.65	14.15	15.26
2NCH 400 R050 1600	4.0 X R0.5	3.50	16.00	3.80	15	60	6	16.90	17.47	18.09	18.75	free
2NCH 400 R050 2000	4.0 X R0.5	3.50	20.00	3.80	15	60	6	21.04	21.75	22.52	23.35	free
2NCH 400 R050 2500	4.0 X R0.5	3.50	25.00	3.80	15	60	6	26.21	27.10	28.06	29.10	free
2NCH 400 R050 3000	4.0 X R0.5	3.50	30.00	3.80	15	70	6	31.37	32.45	33.60	free	free
2NCH 400 R050 4000	4.0 X R0.5	3.50	40.00	3.80	15	80	6	41.71	43.15	free	free	free
2NCH 400 R100 800	4.0 X R1.0	3.50	8.00	3.80	15	50	6	8.62	8.88	9.17	9.47	10.16
2NCH 400 R100 1000	4.0 X R1.0	3.50	10.00	3.80	15	50	6	10.68	11.02	11.38	11.77	12.65
2NCH 400 R100 1200	4.0 X R1.0	3.50	12.00	3.80	15	50	6	12.75	13.16	13.60	14.07	15.13
2NCH 400 R100 1600	4.0 X R1.0	3.50	16.00	3.80	15	60	6	16.89	17.44	18.03	18.67	free
2NCH 400 R100 2000	4.0 X R1.0	3.50	20.00	3.80	15	60	6	21.02	21.72	22.47	23.27	free
2NCH 400 R100 2500	4.0 X R1.0	3.50	25.00	3.80	15	60	6	26.19	27.07	28.01	29.02	free
2NCH 400 R100 3000	4.0 X R1.0	3.50	30.00	3.80	15	70	6	31.36	32.42	33.55	free	free
2NCH 400 R100 4000	4.0 X R1.0	3.50	40.00	3.80	15	80	6	41.69	43.11	free	free	free
2NCH 500 R010 2000	5.0 X R0.1	4.00	20.00	4.75	15	60	6	21.15	21.88	free	free	free
2NCH 500 R010 4000	5.0 X R0.1	4.00	40.00	4.75	15	60	6	41.82	free	free	free	free
2NCH 500 R020 2000	5.0 X R0.2	4.00	20.00	4.75	15	60	6	21.14	21.87	free	free	free
2NCH 500 R020 4000	5.0 X R0.2	4.00	40.00	4.75	15	80	6	41.82	free	free	free	free
2NCH 500 R030 2000	5.0 X R0.3	4.00	20.00	4.75	15	60	6	21.14	21.87	free	free	free
2NCH 500 R030 4000	5.0 X R0.3	4.00	40.00	4.75	15	80	6	41.81	free	free	free	free
2NCH 500 R050 2000	5.0 X R0.5	4.00	20.00	4.75	15	60	6	21.13	21.85	free	free	free
2NCH 500 R050 4000	5.0 X R0.5	4.00	40.00	4.75	15	80	6	41.81	free	free	free	free
2NCH 500 R100 2000	5.0 X R1.0	4.00	20.00	4.75	15	60	6	21.12	21.82	free	free	free
2NCH 500 R100 4000	5.0 X R1.0	4.00	40.00	4.75	15	80	6	41.79	free	free	free	free
2NCH 600 R010 1200	6.0 X R0.1	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R010 1600	6.0 X R0.1	5.00	16.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R010 2000	6.0 X R0.1	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R010 3000	6.0 X R0.1	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R020 1200	6.0 X R0.2	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R020 1600	6.0 X R0.2	5.00	16.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R020 2000	6.0 X R0.2	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R020 3000	6.0 X R0.2	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R030 1200	6.0 X R0.3	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R030 1600	6.0 X R0.3	5.00	16.00	5.70	-	60	6	free	free	free	free	free

(Unit: mm)

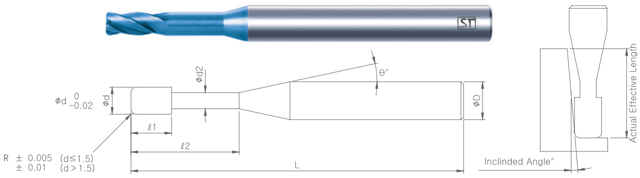
제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	섕크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NCH 600 R030 2000	6.0 X R0.3	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R030 3000	6.0 X R0.3	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R050 1200	6.0 X R0.5	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R050 1600	6.0 X R0.5	5.00	16.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R050 2000	6.0 X R0.5	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R050 3000	6.0 X R0.5	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R100 1200	6.0 X R1.0	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R100 1600	6.0 X R1.0	5.00	16.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R100 2000	6.0 X R1.0	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R100 3000	6.0 X R1.0	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R150 2000	6.0 X R1.5	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NCH 600 R150 3000	6.0 X R1.5	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NCH 800 R020 2400	8.0 X R0.2	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NCH 800 R030 2400	8.0 X R0.3	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NCH 800 R050 2400	8.0 X R0.5	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NCH 800 R100 2400	8.0 X R1.0	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NCH 800 R150 2400	8.0 X R1.5	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NCH 1000 R050 2500	10.0 X R0.5	10.00	25.00	9.50	-	70	10	free	free	free	free	free
2NCH 1000 R100 2500	10.0 X R1.0	10.00	25.00	9.50	-	70	10	free	free	free	free	free
2NCH 1200 R050 2500	12.0 X R0.5	12.00	25.00	11.50	-	80	12	free	free	free	free	free
2NCH 1200 R100 2500	12.0 X R1.0	12.00	25.00	11.50	-	80	12	free	free	free	free	free

4날 코너 R 리브-초고경도용

4F Necked Corner Radius for Super Hardened Steels

4NCH

4 | HX30° | M/G Carbide | S-HC Coated



Features

- Extended neck style for long reach applications
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- A highly-wear resistant nanocomposite coating for oxidation resistance and extreme hardness
- Cutting geometry specifically engineered for super hardened steels
- Improved workpiece surface quality

특징

- 롱 넥 형상으로 깊은 가공에 적합함
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 고 내마모성의 나노컴포지트 코팅으로 내열성이 좋고 고경도소재의 가공에 적합함
- 절삭날의 치수와 형상은 초고경도 소재 가공에 최적화됨
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	섕크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
4NCH 100 R005 400	1.0 X R0.05	0.80	4.00	0.95	15	45	4	4.22	4.37	4.53	4.69	5.07
4NCH 100 R005 500	1.0 X R0.05	0.80	5.00	0.95	15	45	4	5.26	5.44	5.63	5.84	6.31
4NCH 100 R005 600	1.0 X R0.05	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.56
4NCH 100 R005 800	1.0 X R0.05	0.80	8.00	0.95	15	45	4	8.36	8.65	8.96	9.29	10.04
4NCH 100 R005 1000	1.0 X R0.05	0.80	10.00	0.95	15	45	4	10.43	10.79	11.18	11.59	12.53
4NCH 100 R005 1200	1.0 X R0.05	0.80	12.00	0.95	15	45	4	12.49	12.93	13.39	13.89	15.02
4NCH 100 R005 1600	1.0 X R0.05	0.80	16.00	0.95	15	45	4	16.63	17.21	17.83	18.49	19.99
4NCH 100 R010 400	1.0 X R0.1	0.80	4.00	0.95	15	45	4	4.22	4.37	4.52	4.69	5.06
4NCH 100 R010 500	1.0 X R0.1	0.80	5.00	0.95	15	45	4	5.26	5.44	5.63	5.84	6.30
4NCH 100 R010 600	1.0 X R0.1	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.55
4NCH 100 R010 800	1.0 X R0.1	0.80	8.00	0.95	15	45	4	8.36	8.65	8.95	9.29	10.03
4NCH 100 R010 1000	1.0 X R0.1	0.80	10.00	0.95	15	45	4	10.42	10.78	11.17	11.59	12.52
4NCH 100 R010 1200	1.0 X R0.1	0.80	12.00	0.95	15	45	4	12.49	12.92	13.39	13.89	15.00
4NCH 100 R010 1600	1.0 X R0.1	0.80	16.00	0.95	15	45	4	16.63	17.20	17.82	18.48	19.98
4NCH 100 R020 400	1.0 X R0.2	0.80	4.00	0.95	15	45	4	4.22	4.36	4.51	4.67	5.03
4NCH 100 R020 500	1.0 X R0.2	0.80	5.00	0.95	15	45	4	5.25	5.43	5.62	5.82	6.28
4NCH 100 R020 600	1.0 X R0.2	0.80	6.00	0.95	15	45	4	6.29	6.50	6.73	6.97	7.52
4NCH 100 R020 800	1.0 X R0.2	0.80	8.00	0.95	15	45	4	8.35	8.64	8.94	9.27	10.01
4NCH 100 R020 1000	1.0 X R0.2	0.80	10.00	0.95	15	45	4	10.42	10.78	11.16	11.57	12.49
4NCH 100 R020 1200	1.0 X R0.2	0.80	12.00	0.95	15	45	4	12.49	12.92	13.38	13.87	14.98

4날 코너 R 리브-초고경도용
4F Necked Corner Radius for Super Hardened Steels
4NCH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut l1	유효장 Length of Reach l2	목경 Neck Dia d2	구배각 Taper Angle ⊖°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
4NCH 100 R005 400	1.0 X R0.05	0.80	4.00	0.95	15	45	4	4.22	4.37	4.53	4.69	5.07
4NCH 100 R005 500	1.0 X R0.05	0.80	5.00	0.95	15	45	4	5.26	5.44	5.63	5.84	6.31
4NCH 100 R005 600	1.0 X R0.05	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.56
4NCH 100 R005 800	1.0 X R0.05	0.80	8.00	0.95	15	45	4	8.36	8.65	8.96	9.29	10.04
4NCH 100 R005 1000	1.0 X R0.05	0.80	10.00	0.95	15	45	4	10.43	10.79	11.18	11.59	12.53
4NCH 100 R005 1200	1.0 X R0.05	0.80	12.00	0.95	15	45	4	12.49	12.93	13.39	13.89	15.02
4NCH 100 R005 1600	1.0 X R0.05	0.80	16.00	0.95	15	45	4	16.63	17.21	17.83	18.49	19.99
4NCH 100 R010 400	1.0 X R0.1	0.80	4.00	0.95	15	45	4	4.22	4.37	4.52	4.69	5.06
4NCH 100 R010 500	1.0 X R0.1	0.80	5.00	0.95	15	45	4	5.26	5.44	5.63	5.84	6.30
4NCH 100 R010 600	1.0 X R0.1	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.55
4NCH 100 R010 800	1.0 X R0.1	0.80	8.00	0.95	15	45	4	8.36	8.65	8.95	9.29	10.03
4NCH 100 R010 1000	1.0 X R0.1	0.80	10.00	0.95	15	45	4	10.42	10.78	11.17	11.59	12.52
4NCH 100 R010 1200	1.0 X R0.1	0.80	12.00	0.95	15	45	4	12.49	12.92	13.39	13.89	15.00
4NCH 100 R010 1600	1.0 X R0.1	0.80	16.00	0.95	15	45	4	16.63	17.20	17.82	18.48	19.98
4NCH 100 R020 400	1.0 X R0.2	0.80	4.00	0.95	15	45	4	4.22	4.36	4.51	4.67	5.03
4NCH 100 R020 500	1.0 X R0.2	0.80	5.00	0.95	15	45	4	5.25	5.43	5.62	5.82	6.28
4NCH 100 R020 600	1.0 X R0.2	0.80	6.00	0.95	15	45	4	6.29	6.50	6.73	6.97	7.52
4NCH 100 R020 800	1.0 X R0.2	0.80	8.00	0.95	15	45	4	8.35	8.64	8.94	9.27	10.01
4NCH 100 R020 1000	1.0 X R0.2	0.80	10.00	0.95	15	45	4	10.42	10.78	11.16	11.57	12.49
4NCH 100 R020 1200	1.0 X R0.2	0.80	12.00	0.95	15	45	4	12.49	12.92	13.38	13.87	14.98
4NCH 100 R020 1600	1.0 X R0.2	0.80	16.00	0.95	15	45	4	16.62	17.20	17.81	18.47	19.95
4NCH 100 R030 400	1.0 X R0.3	0.80	4.00	0.95	15	45	4	4.22	4.35	4.50	4.66	5.01
4NCH 100 R030 500	1.0 X R0.3	0.80	5.00	0.95	15	45	4	5.25	5.42	5.61	5.81	6.25
4NCH 100 R030 600	1.0 X R0.3	0.80	6.00	0.95	15	45	4	6.28	6.49	6.72	6.96	7.50
4NCH 100 R030 800	1.0 X R0.3	0.80	8.00	0.95	15	45	4	8.35	8.63	8.93	9.26	9.98
4NCH 100 R030 1000	1.0 X R0.3	0.80	10.00	0.95	15	45	4	10.42	10.77	11.15	11.56	12.47
4NCH 100 R030 1200	1.0 X R0.3	0.80	12.00	0.95	15	45	4	12.49	12.91	13.37	13.86	14.96
4NCH 100 R030 1600	1.0 X R0.3	0.80	16.00	0.95	15	45	4	16.62	17.19	17.80	18.46	19.93
4NCH 120 R010 400	1.2X R0.1	1.00	4.00	1.14	15	45	4	4.24	4.39	4.54	4.71	5.08
4NCH 120 R010 600	1.2 X R0.1	1.00	6.00	1.14	15	45	4	6.31	6.53	6.76	7.01	7.57
4NCH 120 R010 800	1.2 X R0.1	1.00	8.00	1.14	15	45	4	8.38	8.67	8.97	9.31	10.06
4NCH 120 R010 1200	1.2 X R0.1	1.00	12.00	1.14	15	45	4	12.51	12.94	13.41	13.91	15.03
4NCH 120 R020 400	1.2X R0.2	1.00	4.00	1.14	15	45	4	4.24	4.38	4.53	4.69	5.06
4NCH 120 R020 600	1.2 X R0.2	1.00	6.00	1.14	15	45	4	6.31	6.52	6.75	6.99	7.54
4NCH 120 R020 800	1.2 X R0.2	1.00	8.00	1.14	15	45	4	8.37	8.66	8.96	9.29	10.03
4NCH 120 R020 1200	1.2 X R0.2	1.00	12.00	1.14	15	45	4	12.51	12.94	13.40	13.89	15.00
4NCH 120 R030 400	1.2X R0.3	1.00	4.00	1.14	15	45	4	4.24	4.37	4.52	4.68	5.03
4NCH 120 R030 600	1.2 X R0.3	1.00	6.00	1.14	15	45	4	6.30	6.51	6.74	6.98	7.52
4NCH 120 R030 800	1.2 X R0.3	1.00	8.00	1.14	15	45	4	8.37	8.65	8.95	9.28	10.01
4NCH 120 R030 1200	1.2 X R0.3	1.00	12.00	1.14	15	45	4	12.50	12.93	13.39	13.88	14.98
4NCH 150 R010 600	1.5 X R0.1	1.35	6.00	1.44	15	45	4	6.31	6.53	6.76	7.01	7.57
4NCH 150 R010 800	1.5 X R0.1	1.35	8.00	1.44	15	45	4	8.38	8.67	8.97	9.31	10.06
4NCH 150 R010 1200	1.5 X R0.1	1.35	12.00	1.44	15	45	4	12.51	12.94	13.41	13.91	15.03

4날 코너 R 리브-초고경도용
4F Necked Corner Radius for Super Hardened Steels
4NCH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut l1	유효장 Length of Reach l2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
4NCH 150 R010 1600	1.5 X R0.1	1.35	16.00	1.44	15	45	4	16.65	17.22	17.84	18.51	20.00
4NCH 150 R010 2000	1.5 X R0.1	1.35	20.00	1.44	15	50	4	20.78	21.50	22.27	23.11	free
4NCH 150 R020 600	1.5 X R0.2	1.35	6.00	1.44	15	45	4	6.31	6.52	6.75	6.99	7.54
4NCH 150 R020 800	1.5 X R0.2	1.35	8.00	1.44	15	45	4	8.37	8.66	8.96	9.29	10.03
4NCH 150 R020 1200	1.5 X R0.2	1.35	12.00	1.44	15	45	4	12.51	12.94	13.40	13.89	15.00
4NCH 150 R020 1600	1.5 X R0.2	1.35	16.00	1.44	15	45	4	16.64	17.22	17.83	18.49	19.98
4NCH 150 R020 2000	1.5 X R0.2	1.35	20.00	1.44	15	50	4	20.78	21.49	22.26	23.09	free
4NCH 150 R030 600	1.5 X R0.3	1.35	6.00	1.44	15	45	4	6.30	6.51	6.74	6.98	7.52
4NCH 150 R030 800	1.5 X R0.3	1.35	8.00	1.44	15	45	4	8.37	8.65	8.95	9.28	10.01
4NCH 150 R030 1200	1.5 X R0.3	1.35	12.00	1.44	15	45	4	12.50	12.93	13.39	13.88	14.98
4NCH 150 R030 1600	1.5 X R0.3	1.35	16.00	1.44	15	45	4	16.64	17.21	17.82	18.48	19.95
4NCH 150 R030 2000	1.5 X R0.3	1.35	20.00	1.44	15	50	4	20.77	21.49	22.25	23.08	free
4NCH 150 R050 600	1.5 X R0.5	1.35	6.00	1.44	15	45	4	6.30	6.50	6.71	6.95	7.47
4NCH 150 R050 800	1.5 X R0.5	1.35	8.00	1.44	15	45	4	8.36	8.64	8.93	9.25	9.96
4NCH 150 R050 1200	1.5 X R0.5	1.35	12.00	1.44	15	45	4	12.50	12.92	13.36	13.85	14.93
4NCH 150 R050 1600	1.5 X R0.5	1.35	16.00	1.44	15	45	4	16.63	17.19	17.80	18.45	19.90
4NCH 150 R050 2000	1.5 X R0.5	1.35	20.00	1.44	15	50	4	20.77	21.47	22.23	23.05	free
4NCH 200 R010 600	2.0 X R0.1	1.70	6.00	1.92	15	45	4	6.35	6.57	6.80	7.05	7.62
4NCH 200 R010 800	2.0 X R0.1	1.70	8.00	1.92	15	45	4	8.42	8.71	9.02	9.35	10.10
4NCH 200 R010 1000	2.0 X R0.1	1.70	10.00	1.92	15	45	4	10.48	10.84	11.23	11.65	12.59
4NCH 200 R010 1200	2.0 X R0.1	1.70	12.00	1.92	15	45	4	12.55	12.98	13.45	13.95	15.07
4NCH 200 R010 1600	2.0 X R0.1	1.70	16.00	1.92	15	50	4	16.68	17.26	17.88	18.55	free
4NCH 200 R010 2000	2.0 X R0.1	1.70	20.00	1.92	15	50	4	20.82	21.54	22.32	23.15	free
4NCH 200 R010 2500	2.0 X R0.1	1.70	25.00	1.92	15	60	4	25.99	26.89	27.86	free	free
4NCH 200 R020 600	2.0 X R0.2	1.70	6.00	1.92	15	45	4	6.34	6.56	6.79	7.04	7.59
4NCH 200 R020 800	2.0 X R0.2	1.70	8.00	1.92	15	45	4	8.41	8.70	9.01	9.34	10.08
4NCH 200 R020 1000	2.0 X R0.2	1.70	10.00	1.92	15	45	4	10.48	10.84	11.22	11.64	12.56
4NCH 200 R020 1200	2.0 X R0.2	1.70	12.00	1.92	15	45	4	12.55	12.98	13.44	13.93	15.05
4NCH 200 R020 1600	2.0 X R0.2	1.70	16.00	1.92	15	50	4	16.68	17.26	17.87	18.53	free
4NCH 200 R020 2000	2.0 X R0.2	1.70	20.00	1.92	15	50	4	20.82	21.53	22.31	23.13	free
4NCH 200 R020 2500	2.0 X R0.2	1.70	25.00	1.92	15	60	4	25.98	26.88	27.85	28.88	free
4NCH 200 R030 600	2.0 X R0.3	1.70	6.00	1.92	15	45	4	6.34	6.55	6.78	7.02	7.57
4NCH 200 R030 800	2.0 X R0.3	1.70	8.00	1.92	15	45	4	8.41	8.69	8.99	9.32	10.05
4NCH 200 R030 1000	2.0 X R0.3	1.70	10.00	1.92	15	45	4	10.48	10.83	11.21	11.62	12.54
4NCH 200 R030 1200	2.0 X R0.3	1.70	12.00	1.92	15	45	4	12.54	12.97	13.43	13.92	15.03
4NCH 200 R030 1600	2.0 X R0.3	1.70	16.00	1.92	15	50	4	16.68	17.25	17.86	18.52	free
4NCH 200 R030 2000	2.0 X R0.3	1.70	20.00	1.92	15	50	4	20.81	21.53	22.29	23.12	free
4NCH 200 R030 2500	2.0 X R0.3	1.70	25.00	1.92	15	60	4	25.98	26.88	27.84	28.87	free
4NCH 200 R050 600	2.0 X R0.5	1.70	6.00	1.92	15	45	4	6.33	6.54	6.76	6.99	7.52
4NCH 200 R050 800	2.0 X R0.5	1.70	8.00	1.92	15	45	4	8.40	8.68	8.97	9.29	10.00
4NCH 200 R050 1000	2.0 X R0.5	1.70	10.00	1.92	15	45	4	10.47	10.82	11.19	11.59	12.49
4NCH 200 R050 1200	2.0 X R0.5	1.70	12.00	1.92	15	45	4	12.54	12.96	13.41	13.89	14.98
4NCH 200 R050 1600	2.0 X R0.5	1.70	16.00	1.92	15	50	4	16.67	17.23	17.84	18.49	free

4NCH

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut l1	유효장 Length of Reach l2	목경 Neck Dia d2	구배각 Taper Angle ⊖°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
4NCH 200 R050 2000	2.0 X R0.5	1.70	20.00	1.92	15	50	4	20.81	21.51	22.27	23.09	free
4NCH 200 R050 2500	2.0 X R0.5	1.70	25.00	1.92	15	60	4	25.97	26.86	27.81	28.84	free
4NCH 250 R010 1000	2.5 X R0.1	2.00	10.00	2.39	15	45	4	10.54	10.90	11.29	11.71	12.66
4NCH 250 R010 1600	2.5 X R0.1	2.00	16.00	2.39	15	50	4	16.74	17.32	17.94	18.61	free
4NCH 250 R010 2500	2.5 X R0.1	2.00	25.00	2.39	15	60	4	26.05	26.95	27.92	free	free
4NCH 250 R020 1000	2.5 X R0.2	2.00	10.00	2.39	15	45	4	10.54	10.90	11.28	11.70	12.63
4NCH 250 R020 1600	2.5 X R0.2	2.00	16.00	2.39	15	50	4	16.74	17.32	17.93	18.60	free
4NCH 250 R020 2500	2.5 X R0.2	2.00	25.00	2.39	15	60	4	26.04	26.94	27.91	free	free
4NCH 250 R030 1000	2.5 X R0.3	2.00	10.00	2.39	15	45	4	10.53	10.89	11.27	11.68	12.61
4NCH 250 R030 1600	2.5 X R0.3	2.00	16.00	2.39	15	50	4	16.74	17.31	17.92	18.58	free
4NCH 250 R030 2500	2.5 X R0.3	2.00	25.00	2.39	15	60	4	26.04	26.94	27.90	free	free
4NCH 250 R050 1000	2.5 X R0.5	2.00	10.00	2.39	15	45	4	10.53	10.88	11.25	11.65	12.56
4NCH 250 R050 1600	2.5 X R0.5	2.00	16.00	2.39	15	50	4	16.73	17.29	17.90	18.55	free
4NCH 250 R050 2500	2.5 X R0.5	2.00	25.00	2.39	15	60	4	26.03	26.92	27.88	free	free
4NCH 300 R010 1000	3.0 X R0.1	2.50	10.00	2.86	15	50	6	10.60	10.96	11.36	11.78	12.73
4NCH 300 R010 1200	3.0 X R0.1	2.50	12.00	2.86	15	50	6	12.67	13.10	13.57	14.08	15.21
4NCH 300 R010 1600	3.0 X R0.1	2.50	16.00	2.86	15	60	6	16.80	17.38	18.01	18.68	20.19
4NCH 300 R010 2000	3.0 X R0.1	2.50	20.00	2.86	15	60	6	20.93	21.66	22.44	23.28	25.16
4NCH 300 R010 2500	3.0 X R0.1	2.50	25.00	2.86	15	60	6	26.10	27.01	27.98	29.03	free
4NCH 300 R010 3000	3.0 X R0.1	2.50	30.00	2.86	15	70	6	31.27	32.36	33.52	34.78	free
4NCH 300 R010 3500	3.0 X R0.1	2.50	35.00	2.86	15	70	6	36.44	37.71	39.06	40.53	free
4NCH 300 R020 1000	3.0 X R0.2	2.50	10.00	2.86	15	50	6	10.59	10.96	11.35	11.76	12.70
4NCH 300 R020 1200	3.0 X R0.2	2.50	12.00	2.86	15	50	6	12.66	13.10	13.56	14.06	15.19
4NCH 300 R020 1600	3.0 X R0.2	2.50	16.00	2.86	15	60	6	16.80	17.38	18.00	18.66	20.16
4NCH 300 R020 2000	3.0 X R0.2	2.50	20.00	2.86	15	60	6	20.93	21.65	22.43	23.26	25.13
4NCH 300 R020 2500	3.0 X R0.2	2.50	25.00	2.86	15	60	6	26.10	27.00	27.97	29.01	free
4NCH 300 R020 3000	3.0 X R0.2	2.50	30.00	2.86	15	70	6	31.27	32.35	33.51	34.76	free
4NCH 300 R020 3500	3.0 X R0.2	2.50	35.00	2.86	15	70	6	36.44	37.70	39.05	40.51	free
4NCH 300 R030 1000	3.0 X R0.3	2.50	10.00	2.86	15	50	6	10.59	10.95	11.34	11.75	12.68
4NCH 300 R030 1200	3.0 X R0.3	2.50	12.00	2.86	15	50	6	12.66	13.09	13.55	14.05	15.16
4NCH 300 R030 1600	3.0 X R0.3	2.50	16.00	2.86	15	60	6	16.79	17.37	17.99	18.65	20.14
4NCH 300 R030 2000	3.0 X R0.3	2.50	20.00	2.86	15	60	6	20.93	21.65	22.42	23.25	25.11
4NCH 300 R030 2500	3.0 X R0.3	2.50	25.00	2.86	15	60	6	26.10	27.00	27.96	29.00	free
4NCH 300 R030 3000	3.0 X R0.3	2.50	30.00	2.86	15	70	6	31.26	32.34	33.50	34.75	free
4NCH 300 R030 3500	3.0 X R0.3	2.50	35.00	2.86	15	70	6	36.43	37.69	39.04	40.50	free
4NCH 300 R050 1000	3.0 X R0.5	2.50	10.00	2.86	15	50	6	10.58	10.94	11.31	11.72	12.63
4NCH 300 R050 1200	3.0 X R0.5	2.50	12.00	2.86	15	50	6	12.65	13.08	13.53	14.02	15.12
4NCH 300 R050 1600	3.0 X R0.5	2.50	16.00	2.86	15	60	6	16.79	17.35	17.96	18.62	20.09
4NCH 300 R050 2000	3.0 X R0.5	2.50	20.00	2.86	15	60	6	20.92	21.63	22.40	23.22	25.06
4NCH 300 R050 2500	3.0 X R0.5	2.50	25.00	2.86	15	60	6	26.09	26.98	27.94	28.97	free
4NCH 300 R050 3000	3.0 X R0.5	2.50	30.00	2.86	15	70	6	31.26	32.33	33.48	34.72	free
4NCH 300 R050 3500	3.0 X R0.5	2.50	35.00	2.86	15	70	6	36.43	37.68	39.02	40.47	free
4NCH 300 R100 1000	3.0 X R1.0	2.50	10.00	2.86	15	50	6	10.57	10.90	11.26	11.64	12.51

4날 코너 R 리브-초고경도용

4F Necked Corner Radius for Super Hardened Steels

4NCH

For Super Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut l1	유효장 Length of Reach l2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
4NCH 300 R100 1200	3.0 X R1.0	2.50	12.00	2.86	15	50	6	12.64	13.04	13.48	13.94	14.99
4NCH 300 R100 1600	3.0 X R1.0	2.50	16.00	2.86	15	60	6	16.77	17.32	17.91	18.54	19.97
4NCH 300 R100 2000	3.0 X R1.0	2.50	20.00	2.86	15	60	6	20.90	21.60	22.34	23.14	24.94
4NCH 300 R100 2500	3.0 X R1.0	2.50	25.00	2.86	15	60	6	26.07	26.95	27.88	28.89	free
4NCH 300 R100 3000	3.0 X R1.0	2.50	30.00	2.86	15	70	6	31.24	32.30	33.43	34.64	free
4NCH 300 R100 3500	3.0 X R1.0	2.50	35.00	2.86	15	70	6	36.41	37.64	38.97	40.39	free
4NCH 400 R010 1200	4.0 X R0.1	4.00	12.00	3.80	15	50	6	12.78	13.22	13.70	14.21	15.35
4NCH 400 R010 1600	4.0 X R0.1	4.00	16.00	3.80	15	60	6	16.92	17.50	18.13	18.81	free
4NCH 400 R010 2000	4.0 X R0.1	4.00	20.00	3.80	15	60	6	21.05	21.78	22.56	23.41	free
4NCH 400 R010 2500	4.0 X R0.1	4.00	25.00	3.80	15	60	6	26.22	27.13	28.11	free	free
4NCH 400 R010 3000	4.0 X R0.1	4.00	30.00	3.80	15	60	6	31.39	32.48	33.65	free	free
4NCH 400 R010 3500	4.0 X R0.1	4.00	35.00	3.80	15	70	6	36.56	37.83	free	free	free
4NCH 400 R010 4000	4.0 X R0.1	4.00	40.00	3.80	15	80	6	41.72	43.17	free	free	free
4NCH 400 R020 1200	4.0 X R0.2	4.00	12.00	3.80	15	50	6	12.78	13.22	13.69	14.19	15.33
4NCH 400 R020 1600	4.0 X R0.2	4.00	16.00	3.80	15	60	6	16.91	17.50	18.12	18.79	free
4NCH 400 R020 2000	4.0 X R0.2	4.00	20.00	3.80	15	60	6	21.05	21.77	22.55	23.39	free
4NCH 400 R020 2500	4.0 X R0.2	4.00	25.00	3.80	15	60	6	26.22	27.12	28.09	free	free
4NCH 400 R020 3000	4.0 X R0.2	4.00	30.00	3.80	15	60	6	31.38	32.47	33.64	free	free
4NCH 400 R020 3500	4.0 X R0.2	4.00	35.00	3.80	15	70	6	36.55	37.82	free	free	free
4NCH 400 R020 4000	4.0 X R0.2	4.00	40.00	3.80	15	80	6	41.72	43.17	free	free	free
4NCH 400 R030 1200	4.0 X R0.3	4.00	12.00	3.80	15	50	6	12.77	13.21	13.68	14.18	15.30
4NCH 400 R030 1600	4.0 X R0.3	4.00	16.00	3.80	15	60	6	16.91	17.49	18.11	18.78	free
4NCH 400 R030 2000	4.0 X R0.3	4.00	20.00	3.80	15	60	6	21.04	21.77	22.54	23.38	free
4NCH 400 R030 2500	4.0 X R0.3	4.00	25.00	3.80	15	60	6	26.21	27.12	28.08	free	free
4NCH 400 R030 3000	4.0 X R0.3	4.00	30.00	3.80	15	60	6	31.38	32.46	33.63	free	free
4NCH 400 R030 3500	4.0 X R0.3	4.00	35.00	3.80	15	70	6	36.55	37.81	free	free	free
4NCH 400 R030 4000	4.0 X R0.3	4.00	40.00	3.80	15	80	6	41.72	43.16	free	free	free
4NCH 400 R050 1200	4.0 X R0.5	4.00	12.00	3.80	12	50	6	12.77	13.20	13.65	14.15	15.26
4NCH 400 R050 1600	4.0 X R0.5	4.00	16.00	3.80	16	60	6	16.90	17.47	18.09	18.75	free
4NCH 400 R050 2000	4.0 X R0.5	4.00	20.00	3.80	20	60	6	21.04	21.75	22.52	23.35	free
4NCH 400 R050 2500	4.0 X R0.5	4.00	25.00	3.80	25	60	6	26.21	27.10	28.06	29.10	free
4NCH 400 R050 3000	4.0 X R0.5	4.00	30.00	3.80	15	60	6	31.37	32.45	33.60	free	free
4NCH 400 R050 3500	4.0 X R0.5	4.00	35.00	3.80	15	70	6	36.54	37.80	free	free	free
4NCH 400 R050 4000	4.0 X R0.5	4.00	40.00	3.80	15	80	6	41.71	43.15	free	free	free
4NCH 400 R100 1200	4.0 X R1.0	4.00	12.00	3.80	15	50	6	12.75	13.16	13.60	14.07	15.13
4NCH 400 R100 1600	4.0 X R1.0	4.00	16.00	3.80	15	60	6	16.89	17.44	18.03	18.67	free
4NCH 400 R100 2000	4.0 X R1.0	4.00	20.00	3.80	15	60	6	21.02	21.72	22.47	23.27	free
4NCH 400 R100 2500	4.0 X R1.0	4.00	25.00	3.80	15	60	6	26.19	27.07	28.01	29.02	free
4NCH 400 R100 3000	4.0 X R1.0	4.00	30.00	3.80	15	60	6	31.36	32.42	33.55	free	free
4NCH 400 R100 3500	4.0 X R1.0	4.00	35.00	3.80	15	70	6	36.53	37.76	39.09	free	free
4NCH 400 R100 4000	4.0 X R1.0	4.00	40.00	3.80	15	80	6	41.69	43.11	free	free	free
4NCH 500 R010 2000	5.0 X R0.1	5.00	20.00	4.75	15	60	6	21.15	21.88	free	free	free
4NCH 500 R010 4000	5.0 X R0.1	5.00	40.00	4.75	15	80	6	41.82	free	free	free	free

4날 코너 R 리브-초고경도용
4F Necked Corner Radius for Super Hardened Steels
4NCH

For Super Hardened Steels

(Unit: mm)

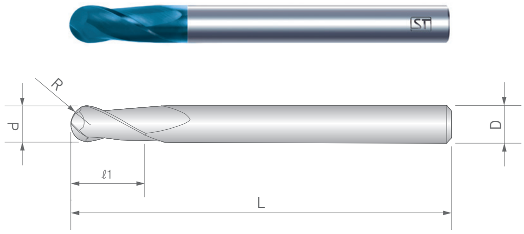
제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut l1	유효장 Length of Reach l2	목경 Neck Dia d2	구배각 Taper Angle ⊖°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
4NCH 500 R020 2000	5.0 X R0.2	5.00	20.00	4.75	15	60	6	21.14	21.87	free	free	free
4NCH 500 R020 4000	5.0 X R0.2	5.00	40.00	4.75	15	80	6	41.82	free	free	free	free
4NCH 500 R030 2000	5.0 X R0.3	5.00	20.00	4.75	15	60	6	21.14	21.87	free	free	free
4NCH 500 R030 4000	5.0 X R0.3	5.00	40.00	4.75	15	80	6	41.81	free	free	free	free
4NCH 500 R050 2000	5.0 X R0.5	5.00	20.00	4.75	15	60	6	21.13	21.85	free	free	free
4NCH 500 R050 4000	5.0 X R0.5	5.00	40.00	4.75	15	80	6	41.81	free	free	free	free
4NCH 500 R100 2000	5.0 X R1.0	5.00	20.00	4.75	15	60	6	21.12	21.82	free	free	free
4NCH 500 R100 4000	5.0 X R1.0	5.00	40.00	4.75	15	80	6	41.79	free	free	free	free
4NCH 600 R010 2000	6.0 X R0.1	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NCH 600 R010 4000	6.0 X R0.1	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NCH 600 R020 2000	6.0 X R0.2	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NCH 600 R020 4000	6.0 X R0.2	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NCH 600 R030 2000	6.0 X R0.3	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NCH 600 R030 4000	6.0 X R0.3	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NCH 600 R050 2000	6.0 X R0.5	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NCH 600 R050 4000	6.0 X R0.5	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NCH 600 R100 2000	6.0 X R1.0	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NCH 600 R100 4000	6.0 X R1.0	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NCH 800 R030 2500	8.0 X R0.3	9.00	25.00	7.60	-	65	8	free	free	free	free	free
4NCH 800 R050 2500	8.0 X R0.5	9.00	25.00	7.60	-	65	8	free	free	free	free	free
4NCH 800 R100 2500	8.0 X R1.0	9.00	25.00	7.60	-	65	8	free	free	free	free	free
4NCH 800 R150 2500	8.0 X R1.5	9.00	25.00	7.60	-	65	8	free	free	free	free	free
4NCH 1000 R050 2500	10.0 X R0.5	11.00	25.00	9.50	-	70	10	free	free	free	free	free
4NCH 1000 R100 2500	10.0 X R1.0	11.00	25.00	9.50	-	70	10	free	free	free	free	free
4NCH 1000 R150 2500	10.0 X R1.5	11.00	25.00	9.50	-	70	10	free	free	free	free	free
4NCH 1000 R200 2500	10.0 X R2.0	11.00	25.00	9.50	-	70	10	free	free	free	free	free
4NCH 1200 R050 3000	12.0 X R0.5	12.00	30.00	11.50	-	80	12	free	free	free	free	free
4NCH 1200 R100 3000	12.0 X R1.0	12.00	30.00	11.50	-	80	12	free	free	free	free	free
4NCH 1200 R150 3000	12.0 X R1.5	12.00	30.00	11.50	-	80	12	free	free	free	free	free
4NCH 1200 R200 3000	12.0 X R2.0	12.00	30.00	11.50	-	80	12	free	free	free	free	free

2날 볼-초고경도용

2F Ball End for Super Hardened Steels

2BH

2 | HX30° | M/G Carbide | S-HC Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- A highly-wear resistant nanocomposite coating for oxidation resistance and extreme hardness
- Cutting geometry specifically engineered for super hardened steels
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 고 내마모성의 나노컴포지트 코팅으로 내열성이 좋고 고경도소재의 가공에 적합함
- 절삭날의 치수와 형상은 초고경도 소재 가공에 최적화됨
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BH 020 040 S4	0.2 X R0.1	0.4	45	4	
2BH 030 060 S4	0.3 X R0.15	0.6	45	4	
2BH 040 080 S4	0.4 X R0.2	0.8	45	4	
2BH 050 100 S4	0.5 X R0.25	1	45	4	
2BH 060 120 S4	0.6 X R0.3	1.2	45	4	
2BH 070 150 S4	0.7 X R0.35	1.5	45	4	
2BH 080 200 S4	0.8 X R0.4	2	45	4	
2BH 100 250 S4	1.0 X R0.5	2.5	45	4	
2BH 100 250 S6	1.0 X R0.5	2.5	50	6	
2BH 120 300 S4	1.2 X R0.6	3	45	4	
2BH 150 300 S4	1.5 X R0.75	3	45	4	
2BH 150 300 S6	1.5 X R0.75	3	50	6	
2BH 200 500 S4	2.0 X R1.0	5	45	4	
2BH 200 500 S6	2.0 X R1.0	5	50	6	
2BH 250 600 S4	2.5 X R1.25	6	45	4	
2BH 250 600 S6	2.5 X R1.25	6	50	6	
2BH 300 800 S4	3.0 X R1.5	8	50	4	
2BH 300 800 S6	3.0 X R1.5	8	60	6	
2BH 350 800 S4	3.5 X R1.75	8	50	4	
2BH 400 800 S4	4.0 X R2.0	8	60	4	
2BH 400 800 S6	4.0 X R2.0	8	60	6	
2BH 500 1000 S6	5.0 X R2.5	10	60	6	
2BH 600 1200 60	6.0 X R3.0	12	60	6	
2BH 600 1200 70	6.0 X R3.0	12	70	6	

2날 볼-초고경도용
2F Ball End for Super Hardened Steels
2BH

(Unit: mm)

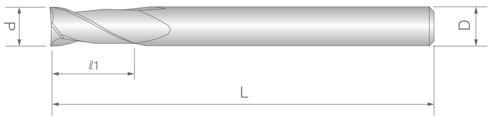
제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BH 600 1200 80	6.0 X R3.0	12	80	6	
2BH 600 1200 90	6.0 X R3.0	12	90	6	
2BH 600 1200 100	6.0 X R3.0	12	100	6	
2BH 700 1400 80	7.0 X R3.5	14	80	8	
2BH 800 1400 60	8.0 X R4.0	14	60	8	
2BH 800 1400 90	8.0 X R4.0	14	90	8	
2BH 800 1400 100	8.0 X R4.0	14	100	8	
2BH 800 1400 110	8.0 X R4.0	14	110	8	
2BH 900 1600 100	9.0 X R4.5	16	100	10	
2BH 1000 1800 70	10.0 X R5.0	18	70	10	
2BH 1000 1800 90	10.0 X R5.0	18	90	10	
2BH 1000 1800 100	10.0 X R5.0	18	100	10	
2BH 1200 2200 75	12.0 X R6.0	22	75	12	
2BH 1200 2200 100	12.0 X R6.0	22	100	12	
2BH 1200 2200 110	12.0 X R6.0	22	110	12	
2BH 1400 2400 110	14.0 X R7.0	24	110	14	
2BH 1600 3000 110	16.0 X R8.0	30	110	16	
2BH 1600 3000 160	16.0 X R8.0	30	160	16	
2BH 2000 3800 160	20.0 X R10.0	38	160	20	

2날 평-초고경도용

2F Square End for Super Hardened Steels

2SH

2 | HX30° | M/G Carbide | S-HC Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- A highly-wear resistant nanocomposite coating for oxidation resistance and extreme hardness
- Cutting geometry specifically engineered for super hardened steels
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 고 내마모성의 나노컴포지트 코팅으로 내열성이 좋고 고경도소재의 가공에 적합함
- 절삭날의 치수와 형상은 초고경도 소재 가공에 최적화됨
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	섕크경 Shank Dia. D	비 고
2SH 020 040 S4	0.2	0.4	38	4	
2SH 030 060 S4	0.3	0.6	38	4	
2SH 040 080 S4	0.4	0.8	38	4	
2SH 050 100 S4	0.5	1	38	4	
2SH 060 120 S4	0.6	1.2	38	4	
2SH 070 140 S4	0.7	1.4	38	4	
2SH 080 160 S4	0.8	1.6	38	4	
2SH 100 250 S4	1	2.5	40	4	
2SH 100 250 S6	1	2.5	40	6	
2SH 120 300 S4	1.2	3	40	4	
2SH 150 400 S4	1.5	4	40	4	
2SH 150 400 S6	1.5	4	40	6	
2SH 200 600 S4	2	6	40	4	
2SH 200 600 S6	2	6	40	6	
2SH 250 800 S4	2.5	8	40	4	
2SH 250 800 S6	2.5	8	40	6	
2SH 300 800 S4	3	8	45	4	
2SH 300 800 S6	3	8	45	6	
2SH 350 800 S4	3.5	8	45	4	
2SH 400 1000 S4	4	10	45	4	
2SH 400 1100 S6	4	11	45	6	
2SH 450 1100 S6	4.5	11	45	6	
2SH 500 1300 S6	5	13	50	6	
2SH 550 1300 S6	5.5	13	50	6	

2SH

(Unit: mm)

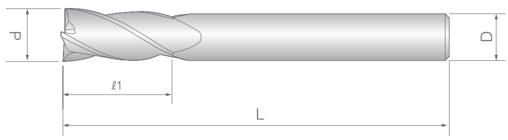
제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SH 600 1300 S6	6	13	50	6	
2SH 650 1500 S8	6.5	15	60	8	
2SH 700 1600 S8	7	16	60	8	
2SH 750 1600 S8	7.5	16	60	8	
2SH 800 1900 S8	8	19	60	8	
2SH 850 1900 S10	8.5	19	70	10	
2SH 900 1900 S10	9	19	70	10	
2SH 950 1900 S10	9.5	19	70	10	
2SH 1000 2200 S10	10	22	70	10	
2SH 1050 2200 S12	10.5	22	75	12	
2SH 1100 2200 S12	11	22	75	12	
2SH 1200 2600 S12	12	26	75	12	
2SH 1400 2600 S14	14	26	80	14	
2SH 1600 3500 S16	16	35	100	16	
2SH 2000 4000 S20	20	40	100	20	

4날 평-초고경도용

4F Square End for Super Hardened Steels

4SH

4 HX30° M/G Carbide S-HC Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- A highly-wear resistant nanocomposite coating for oxidation resistance and extreme hardness
- Cutting geometry specifically engineered for super hardened steels
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 고 내마모성의 나노컴포지트 코팅으로 내열성이 좋고 고경도소재의 가공에 적합함
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- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4SH 100 250 S4	1	2.5	40	4	
4SH 100 250 S6	1	2.5	40	6	
4SH 150 400 S4	1.5	4	40	4	
4SH 150 400 S6	1.5	4	40	6	
4SH 200 600 S4	2	6	40	4	
4SH 200 600 S6	2	6	40	6	
4SH 250 800 S4	2.5	8	40	4	
4SH 250 800 S6	2.5	8	40	6	
4SH 300 800 S4	3	8	45	4	
4SH 300 800 S6	3	8	45	6	
4SH 350 800 S4	3.5	8	45	4	
4SH 400 1100 S4	4	11	45	4	
4SH 400 1100 S6	4	11	45	6	
4SH 450 1100 S6	4.5	11	45	6	
4SH 500 1300 S6	5	13	50	6	
4SH 550 1300 S6	5.5	13	50	6	
4SH 600 1500 S6	6	15	50	6	
4SH 650 1500 S8	6.5	15	50	8	
4SH 700 1600 S8	7	16	60	8	
4SH 750 1600 S8	7.5	16	60	8	
4SH 800 1900 S8	8	19	60	8	
4SH 850 1900 S10	8.5	19	70	10	
4SH 900 1900 S10	9	19	70	10	
4SH 1000 2200 S10	10	22	70	10	

4날 평-초고경도용

4F Square End for Super Hardened Steels

4SH

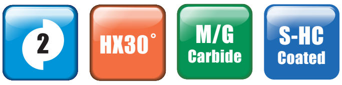
(Unit: mm)

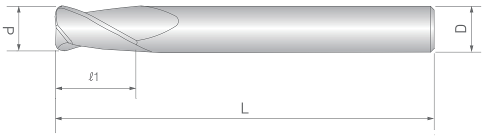
제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4SH 1050 2200 S12	10.5	22	75	12	
4SH 1200 2600 S12	12	26	75	12	
4SH 1400 2600 S14	14	26	80	14	
4SH 1600 3500 S16	16	35	100	16	
4SH 2000 4000 S20	20	40	100	20	

2날 코너 R 롱-초고경도용

2F Corner Radius Long for Super Hardened Steels

2CLH





Features

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- A highly-wear resistant nanocomposite coating for oxidation resistance and extreme hardness
- Cutting geometry specifically engineered for super hardened steels
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 고 내마모성의 나노컴포지트 코팅으로 내열성이 좋고 고경도소재의 가공에 적합함
- 절삭날의 치수와 형상은 초고경도 소재 가공에 최적화됨
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 X 코너R Cutting Dia. Corner R (d x CR)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2CLH 080 R020 50	0.8 X R0.2	1.6	50	6	
2CLH 100 R010 50	1.0 X R0.1	2.5	50	6	
2CLH 100 R020 50	1.0 X R0.2	2.5	50	6	
2CLH 100 R030 50	1.0 X R0.3	2.5	50	6	
2CLH 120 R010 50	1.2 X R0.1	3	50	6	
2CLH 120 R020 50	1.2 X R0.2	3	50	6	
2CLH 150 R010 50	1.5 X R0.1	4	50	6	
2CLH 150 R020 50	1.5 X R0.2	4	50	6	
2CLH 150 R030 50	1.5 X R0.3	4	50	6	
2CLH 150 R050 50	1.5 X R0.5	4	50	6	
2CLH 200 R010 50	2.0 X R0.1	6	50	6	
2CLH 200 R020 50	2.0 X R0.2	6	50	6	
2CLH 200 R030 50	2.0 X R0.3	6	50	6	
2CLH 200 R050 50	2.0 X R0.5	6	50	6	
2CLH 300 R010 60	3.0 X R0.1	8	60	6	
2CLH 300 R020 60	3.0 X R0.2	8	60	6	
2CLH 300 R030 60	3.0 X R0.3	8	60	6	
2CLH 300 R050 60	3.0 X R0.5	8	60	6	
2CLH 300 R100 60	3.0 X R1.0	8	60	6	
2CLH 400 R010 60	4.0 X R0.1	11	60	6	
2CLH 400 R020 60	4.0 X R0.2	11	60	6	
2CLH 400 R030 60	4.0 X R0.3	11	60	6	
2CLH 400 R050 60	4.0 X R0.5	11	60	6	
2CLH 400 R100 60	4.0 X R1.0	11	60	6	

2날 코너 R 롱-초고경도용
2F Corner Radius Long for Super Hardened Steels

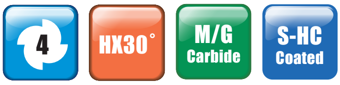
2CLH

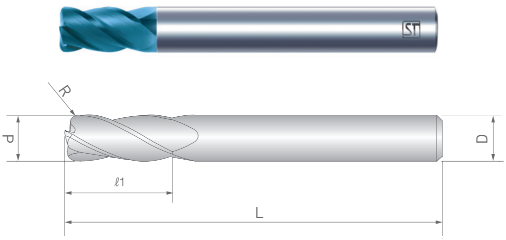
(Unit: mm)

제품 번호 Product No.	날경 X 코너R Cutting Dia. Corner R (d x CR)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2CLH 500 R020 60	5.0 X R0.2	15	60	6	
2CLH 600 R010 60	6.0 X R0.1	15	60	6	
2CLH 600 R020 60	6.0 X R0.2	15	60	6	
2CLH 600 R030 60	6.0 X R0.3	15	60	6	
2CLH 600 R050 60	6.0 X R0.5	15	60	6	
2CLH 600 R100 60	6.0 X R1.0	15	60	6	
2CLH 600 R150 60	6.0 X R1.5	15	60	6	
2CLH 800 R010 60	8.0 X R0.1	19	60	8	
2CLH 800 R020 60	8.0 X R0.2	19	60	8	
2CLH 800 R030 60	8.0 X R0.3	19	60	8	
2CLH 800 R050 60	8.0 X R0.5	19	60	8	
2CLH 800 R100 60	8.0 X R1.0	19	60	8	
2CLH 800 R200 60	8.0 X R2.0	19	60	8	
2CLH 1000 R020 70	10.0 X R0.2	22	70	10	
2CLH 1000 R030 70	10.0 X R0.3	22	70	10	
2CLH 1000 R050 70	10.0 X R0.5	22	70	10	
2CLH 1000 R100 70	10.0 X R1.0	22	70	10	
2CLH 1000 R150 70	10.0 X R1.5	22	70	10	
2CLH 1000 R200 70	10.0 X R2.0	22	70	10	
2CLH 1000 R250 70	10.0 X R2.5	22	70	10	
2CLH 1200 R050 75	12.0 X R0.5	26	75	12	
2CLH 1200 R100 75	12.0 X R1.0	26	75	12	
2CLH 1200 R150 75	12.0 X R1.5	26	75	12	
2CLH 1200 R200 75	12.0 X R2.0	26	75	12	

4날 코너 R 롱-초고경도용
4F Corner Radius Long for Super Hardened Steels

4CLH





Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- A highly-wear resistant nanocomposite coating for oxidation resistance and extreme hardness
- Cutting geometry specifically engineered for super hardened steels
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
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- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

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○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 X 코너R Cutting Dia. Corner R (d x CR)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4CLH 150 R020 45	1.5 X R0.2	4	45	4	
4CLH 150 R030 45	1.5 X R0.3	4	45	4	
4CLH 200 R020 45	2.0 X R0.2	6	45	4	
4CLH 200 R030 45	2.0 X R0.3	6	45	4	
4CLH 200 R050 45	2.0 X R0.5	6	45	4	
4CLH 300 R020 60	3.0 X R0.2	8	60	6	
4CLH 300 R030 60	3.0 X R0.3	8	60	6	
4CLH 300 R050 60	3.0 X R0.5	8	60	6	
4CLH 400 R020 60	4.0 X R0.2	11	60	6	
4CLH 400 R030 60	4.0 X R0.3	11	60	6	
4CLH 400 R050 60	4.0 X R0.5	11	60	6	
4CLH 400 R100 60	4.0 X R1.0	11	60	6	
4CLH 500 R050 60	5.0 X R0.5	11	60	6	
4CLH 600 R020 70	6.0 X R0.2	15	70	6	
4CLH 600 R030 70	6.0 X R0.3	15	70	6	
4CLH 600 R050 70	6.0 X R0.5	15	70	6	
4CLH 600 R100 70	6.0 X R1.0	15	70	6	
4CLH 600 R150 70	6.0 X R1.5	15	70	6	
4CLH 800 R020 80	8.0 X R0.2	19	80	8	
4CLH 800 R030 80	8.0 X R0.3	19	80	8	
4CLH 800 R050 80	8.0 X R0.5	19	80	8	
4CLH 800 R100 80	8.0 X R1.0	19	80	8	
4CLH 1000 R050 80	10.0 X R0.5	22	80	10	
4CLH 1000 R100 80	10.0 X R1.0	22	80	10	

4날 코너 R 롱-초고경도용
4F Corner Radius Long for Super Hardened Steels

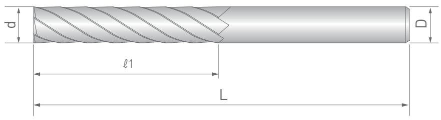
4CLH

(Unit: mm)

제품 번호 Product No.	날경 X 코너R Cutting Dia. Corner R (d x CR)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4CLH 1000 R150 80	10.0 X R1.5	22	80	10	
4CLH 1200 R050 80	12.0 X R0.5	26	80	12	
4CLH 1200 R100 80	12.0 X R1.0	26	80	12	
4CLH 1200 R200 80	12.0 X R2.0	26	80	12	

6날 평-초고경도용
6F Square Endmill for Super Hardened Steel
6SH

6 | HX45° | M/G Carbide | S-HC Coated



Features

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- Improved workpiece surface quality

특징

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- 고 내마모성의 나노컴포지트 코팅으로 내열성이 좋고 고경도소재의 가공에 적합함
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Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

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○	△	○		○	◎					

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut l1	전장 Overall Length L	생크경 Shank Dia. D	비 고
6SH 600 1500 50	6	15	50	6	
6SH 600 2000 60	6	20	60	6	
6SH 600 2500 65	6	25	65	6	
6SH 600 3000 70	6	30	70	6	
6SH 800 2500 65	8	25	65	8	
6SH 800 3000 70	8	30	70	8	
6SH 800 3500 90	8	35	90	8	
6SH 800 4000 90	8	40	90	8	
6SH 1000 3500 80	10	35	80	10	
6SH 1000 4500 100	10	45	100	10	
6SH 1000 5500 110	10	55	110	10	
6SH 1200 4000 90	12	40	90	12	
6SH 1200 5000 100	12	50	100	12	
6SH 1200 6000 110	12	60	110	12	
6SH 1600 4500 100	16	45	100	16	
6SH 1600 5000 110	16	50	110	16	
6SH 1600 8000 150	16	80	150	16	
6SH 2000 5000 110	20	50	110	20	
6SH 2000 8000 150	20	80	150	20	
6SH 2000 10000 160	20	100	160	20	

스타공구(주)
Star Tool Co., Ltd.

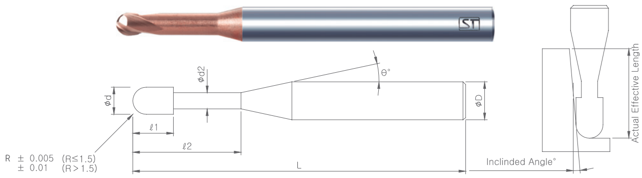
For Hardened Steels

SPEED-1

2날 볼 리브
2F Necked Ball End

2NB

2 | HX30° | M/G Carbide | AlTiSiN Coated



Features

- Extended neck style for long reach applications
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징

- 롱 넥 형상으로 깊은 가공에 적합함
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NB 020 050	0.2 X R0.1	0.15	0.50	0.18	15	45	4	0.55	0.56	0.58	0.6	0.64
2NB 020 075	0.2 X R0.1	0.15	0.75	0.18	15	45	4	0.81	0.83	0.86	0.89	0.95
2NB 020 100	0.2 X R0.1	0.15	1.00	0.18	15	45	4	1.06	1.1	1.13	1.17	1.26
2NB 020 125	0.2 X R0.1	0.15	1.25	0.18	15	45	4	1.32	1.37	1.41	1.46	1.57
2NB 020 150	0.2 X R0.1	0.15	1.50	0.18	15	45	4	1.58	1.63	1.69	1.75	1.88
2NB 020 200	0.2 X R0.1	0.15	2.00	0.18	15	45	4	2.1	2.17	2.24	2.32	2.5
2NB 020 250	0.2 X R0.1	0.15	2.50	0.18	15	45	4	2.61	2.7	2.8	2.9	3.12
2NB 020 300	0.2 X R0.1	0.15	3.00	0.18	15	45	4	3.13	3.24	3.35	3.47	3.75
2NB 030 050	0.3 X R0.15	0.25	0.50	0.28	15	45	4	0.55	0.56	0.57	0.59	0.63
2NB 030 075	0.3 X R0.15	0.25	0.75	0.28	15	45	4	0.80	0.83	0.85	0.88	0.94
2NB 030 100	0.3 X R0.15	0.25	1.00	0.28	15	45	4	1.06	1.09	1.13	1.17	1.25
2NB 030 125	0.3 X R0.15	0.25	1.25	0.28	15	45	4	1.32	1.36	1.41	1.45	1.56
2NB 030 150	0.3 X R0.15	0.25	1.50	0.28	15	45	4	1.58	1.63	1.68	1.74	1.87
2NB 030 200	0.3 X R0.15	0.25	2.00	0.28	15	45	4	2.10	2.16	2.24	2.32	2.49
2NB 030 250	0.3 X R0.15	0.25	2.50	0.28	15	45	4	2.61	2.70	2.79	2.89	3.11
2NB 030 300	0.3 X R0.15	0.25	3.00	0.28	15	45	4	3.13	3.23	3.35	3.47	3.73
2NB 040 100	0.4 X R0.2	0.30	1.00	0.37	15	45	4	1.08	1.11	1.14	1.18	1.26
2NB 040 150	0.4 X R0.2	0.30	1.50	0.37	15	45	4	1.60	1.65	1.70	1.75	1.88
2NB 040 200	0.4 X R0.2	0.30	2.00	0.37	15	45	4	2.11	2.18	2.25	2.33	2.50
2NB 040 250	0.4 X R0.2	0.30	2.50	0.37	15	45	4	2.63	2.72	2.81	2.90	3.12
2NB 040 300	0.4 X R0.2	0.30	3.00	0.37	15	45	4	3.15	3.25	3.36	3.48	3.75
2NB 040 350	0.4 X R0.2	0.30	3.50	0.37	15	45	4	3.66	3.78	3.91	4.05	4.37

2날 볼 리브
2F Necked Ball End

2NB

For Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NB 040 400	0.4 X R0.2	0.30	4.00	0.37	15	45	4	4.18	4.32	4.47	4.63	4.99
2NB 040 450	0.4 X R0.2	0.30	4.50	0.37	15	45	4	4.70	4.85	5.02	5.20	5.61
2NB 040 500	0.4 X R0.2	0.30	5.00	0.37	15	45	4	5.21	5.39	5.58	5.78	6.23
2NB 040 600	0.4 X R0.2	0.30	6.00	0.37	15	45	4	6.25	6.46	6.69	6.93	7.47
2NB 040 800	0.4 X R0.2	0.30	8.00	0.37	15	45	4	8.32	8.60	8.90	9.23	9.96
2NB 050 100	0.5 X R0.25	0.35	1.00	0.47	15	45	4	1.08	1.11	1.14	1.17	1.25
2NB 050 150	0.5 X R0.25	0.35	1.50	0.47	15	45	4	1.59	1.64	1.69	1.75	1.87
2NB 050 200	0.5 X R0.25	0.35	2.00	0.47	15	45	4	2.11	2.18	2.25	2.32	2.49
2NB 050 250	0.5 X R0.25	0.35	2.50	0.47	15	45	4	2.63	2.71	2.80	2.90	3.11
2NB 050 300	0.5 X R0.25	0.35	3.00	0.47	15	45	4	3.15	3.25	3.35	3.47	3.73
2NB 050 400	0.5 X R0.25	0.35	4.00	0.47	15	45	4	4.18	4.32	4.46	4.62	4.98
2NB 050 500	0.5 X R0.25	0.35	5.00	0.47	15	45	4	5.21	5.39	5.57	5.77	6.22
2NB 050 600	0.5 X R0.25	0.35	6.00	0.47	15	45	4	6.25	6.46	6.68	6.92	7.46
2NB 050 800	0.5 X R0.25	0.35	8.00	0.47	15	45	4	8.31	8.59	8.90	9.22	9.95
2NB 050 1000	0.5 X R0.25	0.35	10.00	0.47	15	45	4	10.38	10.73	11.11	11.52	12.44
2NB 060 100	0.6 X R0.3	0.40	1.00	0.57	15	45	4	1.08	1.10	1.13	1.16	1.23
2NB 060 200	0.6 X R0.3	0.40	2.00	0.57	15	45	4	2.11	2.17	2.24	2.31	2.48
2NB 060 250	0.6 X R0.3	0.40	2.50	0.57	15	45	4	2.63	2.71	2.80	2.89	3.10
2NB 060 300	0.6 X R0.3	0.40	3.00	0.57	15	45	4	3.14	3.24	3.35	3.46	3.72
2NB 060 350	0.6 X R0.3	0.40	3.50	0.57	15	45	4	3.66	3.78	3.90	4.04	4.34
2NB 060 400	0.6 X R0.3	0.40	4.00	0.57	15	45	4	4.18	4.31	4.46	4.61	4.96
2NB 060 450	0.6 X R0.3	0.40	4.50	0.57	15	45	4	4.69	4.85	5.01	5.19	5.59
2NB 060 500	0.6 X R0.3	0.40	5.00	0.57	15	45	4	5.21	5.38	5.57	5.76	6.21
2NB 060 550	0.6 X R0.3	0.40	5.50	0.57	15	45	4	5.73	5.92	6.12	6.34	6.83
2NB 060 600	0.6 X R0.3	0.40	6.00	0.57	15	45	4	6.24	6.45	6.67	6.91	7.45
2NB 060 800	0.6 X R0.3	0.40	8.00	0.57	15	45	4	8.31	8.59	8.89	9.21	9.94
2NB 060 1000	0.6 X R0.3	0.40	10.00	0.57	15	45	4	10.38	10.73	11.11	11.51	12.42
2NB 060 1200	0.6 X R0.3	0.40	12.00	0.57	15	45	4	12.45	12.87	13.32	13.81	14.91
2NB 070 200	0.7 X R0.35	0.45	2.00	0.66	15	45	4	2.13	2.19	2.26	2.33	2.49
2NB 070 400	0.7 X R0.35	0.45	4.00	0.66	15	45	4	4.20	4.33	4.47	4.63	4.98
2NB 070 600	0.7 X R0.35	0.45	6.00	0.66	15	45	4	6.26	6.47	6.69	6.93	7.46
2NB 070 800	0.7 X R0.35	0.45	8.00	0.66	15	45	4	8.33	8.61	8.91	9.23	9.95
2NB 080 200	0.8 X R0.4	0.50	2.00	0.77	15	45	4	2.11	2.17	2.23	2.30	2.45
2NB 080 300	0.8 X R0.4	0.50	3.00	0.77	15	45	4	3.14	3.24	3.34	3.45	3.70
2NB 080 400	0.8 X R0.4	0.50	4.00	0.77	15	45	4	4.17	4.31	4.45	4.60	4.94
2NB 080 500	0.8 X R0.4	0.50	5.00	0.77	15	45	4	5.21	5.38	5.56	5.75	6.18
2NB 080 600	0.8 X R0.4	0.50	6.00	0.77	15	45	4	6.24	6.45	6.66	6.90	7.43
2NB 080 800	0.8 X R0.4	0.50	8.00	0.77	15	45	4	8.31	8.58	8.88	9.20	9.91
2NB 080 1000	0.8 X R0.4	0.50	10.00	0.77	15	45	4	10.38	10.72	11.10	11.50	12.40
2NB 080 1200	0.8 X R0.4	0.50	12.00	0.77	15	45	4	12.44	12.86	13.31	13.80	14.89
2NB 090 200	0.9X R0.45	0.60	2.00	0.85	15	45	4	2.14	2.20	2.27	2.33	2.49
2NB 090 400	0.9X R0.45	0.60	4.00	0.85	15	45	4	4.21	4.34	4.48	4.63	4.97
2NB 090 600	0.9X R0.45	0.60	6.00	0.85	15	45	4	6.28	6.48	6.70	6.93	7.46

2날 볼 리브
2F Necked Ball End

2NB

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle ⊖°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NB 090 800	0.9X R0.45	0.60	8.00	0.85	15	45	4	8.35	8.62	8.92	9.23	9.95
2NB 090 1000	0.9X R0.45	0.60	10.00	0.85	15	45	4	10.41	10.76	11.13	11.53	12.43
2NB 100 200	1.0 X R0.6	0.80	2.00	0.95	15	45	4	2.14	2.20	2.26	2.33	2.48
2NB 100 300	1.0 X R0.5	0.80	3.00	0.95	15	45	4	3.18	3.27	3.37	3.48	3.72
2NB 100 400	1.0 X R0.5	0.80	4.00	0.95	15	45	4	4.21	4.34	4.48	4.63	4.96
2NB 100 400 S6	1.0 X R0.5	0.80	4.00	0.95	15	50	6	4.21	4.34	4.48	4.63	4.96
2NB 100 500	1.0 X R0.5	0.80	5.00	0.95	15	45	4	5.24	5.41	5.59	5.78	6.21
2NB 100 600	1.0 X R0.5	0.80	6.00	0.95	15	45	4	6.28	6.48	6.69	6.93	7.45
2NB 100 600 S6	1.0 X R0.5	0.80	6.00	0.95	15	50	6	6.28	6.48	6.69	6.93	7.45
2NB 100 800	1.0 X R0.5	0.80	8.00	0.95	15	45	4	8.34	8.62	8.91	9.23	9.93
2NB 100 800 S6	1.0 X R0.5	0.80	8.00	0.95	15	50	6	8.34	8.62	8.91	9.23	9.93
2NB 100 1000	1.0 X R0.5	0.80	10.00	0.95	15	45	4	10.41	10.76	11.13	11.53	12.42
2NB 100 1000 S6	1.0 X R0.5	0.80	10.00	0.95	15	50	6	10.41	10.76	11.13	11.53	12.42
2NB 100 1200	1.0 X R0.5	0.80	12.00	0.95	15	45	4	12.48	12.90	13.34	13.83	14.91
2NB 100 1200 S6	1.0 X R0.5	0.80	12.00	0.95	15	50	6	12.48	12.90	13.34	13.83	14.91
2NB 100 1400	1.0 X R0.5	0.80	14.00	0.95	15	45	4	14.55	15.04	15.56	16.13	17.39
2NB 100 1600	1.0 X R0.5	0.80	16.00	0.95	15	50	4	16.61	17.17	17.78	18.43	19.88
2NB 100 1600 S6	1.0 X R0.5	0.80	16.00	0.95	15	60	6	16.61	17.17	17.78	18.43	19.88
2NB 100 1800	1.0 X R0.5	0.80	18.00	0.95	15	50	4	18.68	19.31	19.99	20.72	22.37
2NB 100 2000	1.0 X R0.5	0.80	20.00	0.95	15	50	4	20.75	21.45	22.21	23.02	24.85
2NB 100 2000 S6	1.0 X R0.5	0.80	20.00	0.95	15	60	6	20.75	21.45	22.21	23.02	24.85
2NB 120 400	1.2 X R0.6	1.20	4.00	1.14	15	45	4	4.23	4.35	4.49	4.63	4.96
2NB 120 600	1.2 X R0.6	1.20	6.00	1.14	15	45	4	6.29	6.49	6.70	6.93	7.45
2NB 120 800	1.2 X R0.6	1.20	8.00	1.14	15	45	4	8.36	8.63	8.92	9.23	9.93
2NB 120 1000	1.2 X R0.6	1.20	10.00	1.14	15	45	4	10.43	10.77	11.14	11.53	12.42
2NB 120 1200	1.2 X R0.6	1.20	12.00	1.14	15	45	4	12.49	12.91	13.35	13.83	14.91
2NB 120 1600	1.2 X R0.6	1.20	16.00	1.14	15	50	4	16.63	17.19	17.79	18.43	19.88
2NB 120 2000	1.2 X R0.6	1.20	20.00	1.14	15	50	4	20.76	21.47	22.22	23.03	24.85
2NB 150 300	1.5 X R0.75	1.35	3.00	1.44	15	45	4	3.19	3.27	3.36	3.46	3.68
2NB 150 400	1.5 X R0.75	1.35	4.00	1.44	15	45	4	4.22	4.34	4.47	4.61	4.92
2NB 150 400 S6	1.5 X R0.75	1.35	4.00	1.44	15	50	6	4.22	4.34	4.47	4.61	4.92
2NB 150 600	1.5 X R0.75	1.35	6.00	1.44	15	45	4	6.29	6.48	6.69	6.91	7.41
2NB 150 600 S6	1.5 X R0.75	1.35	6.00	1.44	15	50	6	6.29	6.48	6.69	6.91	7.41
2NB 150 800	1.5 X R0.75	1.35	8.00	1.44	15	45	4	8.35	8.62	8.90	9.21	9.90
2NB 150 800 S6	1.5 X R0.75	1.35	8.00	1.44	15	50	6	8.35	8.62	8.90	9.21	9.90
2NB 150 1000	1.5 X R0.75	1.35	10.00	1.44	15	45	4	10.42	10.76	11.12	11.51	12.38
2NB 150 1000 S6	1.5 X R0.75	1.35	10.00	1.44	15	50	6	10.42	10.76	11.12	11.51	12.38
2NB 150 1200	1.5 X R0.75	1.35	12.00	1.44	15	45	4	12.49	12.90	13.34	13.81	14.87
2NB 150 1200 S6	1.5 X R0.75	1.35	12.00	1.44	15	50	6	12.49	12.90	13.34	13.81	14.87
2NB 150 1400	1.5 X R0.75	1.35	14.00	1.44	15	45	4	14.56	15.04	15.55	16.11	17.36
2NB 150 1600	1.5 X R0.75	1.35	16.00	1.44	15	50	4	16.62	17.18	17.77	18.41	19.84
2NB 150 1600 S6	1.5 X R0.75	1.35	16.00	1.44	15	60	6	16.62	17.18	17.77	18.41	19.84
2NB 150 2000	1.5 X R0.75	1.35	20.00	1.44	15	50	4	20.76	21.46	22.20	23.01	free

2날 볼 리브
2F Necked Ball End
2NB

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle ϴ°	전장 Overall Length L	섕크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NB 150 2000 S6	1.5 X R0.75	1.35	20.00	1.44	15	60	6	20.76	21.46	22.20	23.01	24.81
2NB 150 2500	1.5 X R0.75	1.35	25.00	1.44	15	60	4	25.93	26.80	27.75	28.76	free
2NB 150 3000	1.5 X R0.75	1.35	30.00	1.44	15	70	4	31.10	32.15	33.29	34.51	free
2NB 160 600	1.6 X R0.8	1.60	6.00	1.55	15	45	4	6.27	6.46	6.66	6.88	7.38
2NB 160 800	1.6 X R0.8	1.60	8.00	1.55	15	45	4	8.33	8.60	8.88	9.18	9.86
2NB 160 1000	1.6 X R0.8	1.60	10.00	1.55	15	45	4	10.40	10.74	11.09	11.48	12.35
2NB 160 1200	1.6 X R0.8	1.60	12.00	1.55	15	45	4	12.47	12.88	13.31	13.78	14.83
2NB 160 1600	1.6 X R0.8	1.60	16.00	1.55	15	50	4	16.60	17.15	17.74	18.38	19.81
2NB 160 2000	1.6 X R0.8	1.60	20.00	1.55	15	50	4	20.74	21.43	22.18	22.98	free
2NB 200 400	2.0 X R1.0	1.80	4.00	1.92	15	45	4	4.25	4.36	4.49	4.62	4.91
2NB 200 600	2.0 X R1.0	1.80	6.00	1.92	15	45	4	6.32	6.50	6.70	6.92	7.40
2NB 200 600 S6	2.0 X R1.0	1.80	6.00	1.92	15	50	6	6.32	6.50	6.70	6.92	7.40
2NB 200 800	2.0 X R1.0	1.80	8.00	1.92	15	45	4	8.38	8.64	8.92	9.22	9.88
2NB 200 800 S6	2.0 X R1.0	1.80	8.00	1.92	15	50	6	8.38	8.64	8.92	9.22	9.88
2NB 200 1000	2.0 X R1.0	1.80	10.00	1.92	15	45	4	10.45	10.78	11.14	11.52	12.37
2NB 200 1000 S6	2.0 X R1.0	1.80	10.00	1.92	15	50	6	10.45	10.78	11.14	11.52	12.37
2NB 200 1200	2.0 X R1.0	1.80	12.00	1.92	15	45	4	12.52	12.92	13.35	13.82	14.86
2NB 200 1200 S6	2.0 X R1.0	1.80	12.00	1.92	15	50	6	12.52	12.92	13.35	13.82	14.86
2NB 200 1400	2.0 X R1.0	1.80	14.00	1.92	15	45	4	14.59	15.06	15.57	16.11	17.34
2NB 200 1600	2.0 X R1.0	1.80	16.00	1.92	15	50	4	16.65	17.20	17.79	18.41	19.83
2NB 200 1600 S6	2.0 X R1.0	1.80	16.00	1.92	15	60	6	16.65	17.20	17.79	18.41	19.83
2NB 200 1800	2.0 X R1.0	1.80	18.00	1.92	15	50	4	18.72	19.34	20.00	20.71	free
2NB 200 2000	2.0 X R1.0	1.80	20.00	1.92	15	50	4	20.79	21.48	22.22	23.01	free
2NB 200 2000 S6	2.0 X R1.0	1.80	20.00	1.92	15	60	6	20.79	21.48	22.22	23.01	24.80
2NB 200 2500	2.0 X R1.0	1.80	25.00	1.92	15	60	4	25.96	26.83	27.76	28.76	free
2NB 200 2500 S6	2.0 X R1.0	1.80	25.00	1.92	15	60	6	25.96	26.83	27.76	28.76	31.02
2NB 200 3000	2.0 X R1.0	1.80	30.00	1.92	15	70	4	31.13	32.18	33.30	free	free
2NB 200 3500	2.0 X R1.0	1.80	35.00	1.92	15	70	4	36.29	37.52	38.84	free	free
2NB 200 4000	2.0 X R1.0	1.80	40.00	1.92	15	80	4	41.46	42.87	free	free	free
2NB 250 800	2.5 X R1.25	2.50	8.00	2.39	15	45	4	8.43	8.68	8.95	9.24	9.89
2NB 250 1000	2.5 X R1.25	2.50	10.00	2.39	15	45	4	10.50	10.82	11.17	11.54	12.38
2NB 250 1200	2.5 X R1.25	2.50	12.00	2.39	15	45	4	12.57	12.96	13.39	13.84	14.86
2NB 250 1600	2.5 X R1.25	2.50	16.00	2.39	15	50	4	16.70	17.24	17.82	18.44	free
2NB 250 2000	2.5 X R1.25	2.50	20.00	2.39	15	50	4	20.84	21.52	22.25	free	free
2NB 250 2500	2.5 X R1.25	2.50	25.00	2.39	15	60	4	26.01	26.87	27.79	free	free
2NB 300 600	3.0 X R1.5	3.00	6.00	2.86	15	50	6	6.42	6.59	6.77	6.97	7.41
2NB 300 800	3.0 X R1.5	3.00	8.00	2.86	15	50	6	8.48	8.73	8.99	9.27	9.90
2NB 300 1000	3.0 X R1.5	3.00	10.00	2.86	15	50	6	10.55	10.87	11.21	11.57	12.39
2NB 300 1200	3.0 X R1.5	3.00	12.00	2.86	15	50	6	12.62	13.01	13.42	13.87	14.87
2NB 300 1400	3.0 X R1.5	3.00	14.00	2.86	15	50	6	14.69	15.15	15.64	16.17	17.36
2NB 300 1600	3.0 X R1.5	3.00	16.00	2.86	15	60	6	16.75	17.28	17.86	18.47	19.85
2NB 300 1800	3.0 X R1.5	3.00	18.00	2.86	15	60	6	18.82	19.42	20.07	20.77	22.33
2NB 300 2000	3.0 X R1.5	3.00	20.00	2.86	15	60	6	20.89	21.56	22.29	23.07	24.82

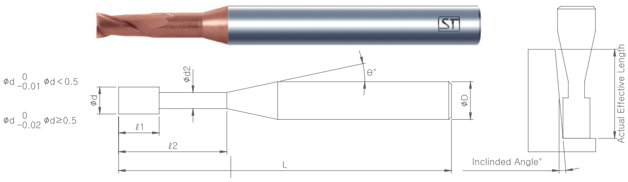
2NB

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NB 300 2500	3.0 X R1.5	3.00	25.00	2.86	15	60	6	26.06	26.91	27.83	28.82	free
2NB 300 3000	3.0 X R1.5	3.00	30.00	2.86	15	70	6	31.22	32.26	33.37	34.57	free
2NB 300 3500	3.0 X R1.5	3.00	35.00	2.86	15	70	6	36.39	37.61	38.91	40.32	free
2NB 300 4000	3.0 X R1.5	3.00	40.00	2.86	15	80	6	41.56	42.96	44.45	free	free
2NB 300 5000	3.0 X R1.5	3.00	50.00	2.86	15	100	6	51.90	53.65	55.54	free	free
2NB 350 1500	3.5 X R1.75	3.50	15.00	3.35	15	60	6	15.73	16.22	16.74	17.30	18.56
2NB 350 2000	3.5 X R1.75	3.50	20.00	3.35	15	60	6	20.90	21.57	22.28	23.05	24.78
2NB 350 2500	3.5 X R1.75	3.50	25.00	3.35	15	60	6	26.07	26.91	27.82	28.80	free
2NB 350 3000	3.5 X R1.75	3.50	30.00	3.35	15	70	6	31.24	32.26	33.37	34.55	free
2NB 350 4000	3.5 X R1.75	3.50	40.00	3.35	15	80	6	41.57	42.96	44.45	free	free
2NB 400 1000	4.0 X R2.0	4.00	10.00	3.80	15	50	6	10.65	10.95	11.28	11.62	12.40
2NB 400 1200	4.0 X R2.0	4.00	12.00	3.80	15	50	6	12.72	13.09	13.49	13.92	14.89
2NB 400 1600	4.0 X R2.0	4.00	16.00	3.80	15	60	6	16.85	17.37	17.93	18.52	19.86
2NB 400 2000	4.0 X R2.0	4.00	20.00	3.80	15	60	6	20.99	21.65	22.36	23.12	free
2NB 400 2500	4.0 X R2.0	4.00	25.00	3.80	15	60	6	26.16	27.00	27.90	28.87	free
2NB 400 3000	4.0 X R2.0	4.00	30.00	3.80	15	70	6	31.32	32.35	33.44	free	free
2NB 400 3500	4.0 X R2.0	4.00	35.00	3.80	15	70	6	36.49	37.69	38.98	free	free
2NB 400 4000	4.0 X R2.0	4.00	40.00	3.80	15	80	6	41.66	43.04	free	free	free
2NB 400 5000	4.0 X R2.0	4.00	50.00	3.80	15	100	6	52.00	53.74	free	free	free
2NB 600 1500	6.0 X R3.0	7.00	15.00	5.70	-	60	6	free	free	free	free	free
2NB 600 2000	6.0 X R3.0	7.00	20.00	5.70	-	60	6	free	free	free	free	free
2NB 600 3000	6.0 X R3.0	7.00	30.00	5.70	-	110	6	free	free	free	free	free
2NB 800 2000	8.0 X R4.0	10.00	20.00	7.60	-	60	8	free	free	free	free	free
2NB 800 3000	8.0 X R4.0	10.00	30.00	7.60	-	100	8	free	free	free	free	free
2NB 1000 2500	10.0 X R5.0	12.00	25.00	9.50	-	70	10	free	free	free	free	free
2NB 1000 3500	10.0 X R5.0	12.00	35.00	9.50	-	100	10	free	free	free	free	free
2NB 1200 3000	12.0 X R6.0	14.00	30.00	11.50	-	80	12	free	free	free	free	free
2NB 1200 4000	12.0 X R6.0	14.00	40.00	11.50	-	110	12	free	free	free	free	free

2날 평 리브
2F Necked Square End
2NS

2 | HX30° | M/G Carbide | AlTiSiN Coated



Features
- Extended neck style for long reach applications
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 롱 넥 형상으로 깊은 가공에 적합함
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

For Hardened Steels

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NS 010 030	0.1	0.15	0.30	0.085	15	45	4	0.33	0.35	0.36	0.37	0.40
2NS 010 050	0.1	0.15	0.50	0.085	15	45	4	0.54	0.56	0.58	0.60	0.65
2NS 010 100	0.1	0.15	1.00	0.085	15	45	4	1.06	1.09	1.13	1.18	1.27
2NS 015 030	0.15	0.20	0.30	0.13	15	45	4	0.34	0.36	0.37	0.38	0.41
2NS 015 050	0.15	0.20	0.50	0.13	15	45	4	0.55	0.57	0.59	0.61	0.66
2NS 015 100	0.15	0.20	1.00	0.13	15	45	4	1.07	1.10	1.14	1.19	1.28
2NS 020 050	0.2	0.30	0.50	0.18	15	45	4	0.55	0.57	0.59	0.61	0.66
2NS 020 100	0.2	0.30	1.00	0.18	15	45	4	1.07	1.10	1.14	1.19	1.28
2NS 020 150	0.2	0.30	1.50	0.18	15	45	4	1.58	1.64	1.70	1.76	1.91
2NS 020 200	0.2	0.30	2.00	0.18	15	45	4	2.10	2.17	2.25	2.34	2.53
2NS 020 300	0.2	0.30	3.00	0.18	15	45	4	3.13	3.24	3.36	3.49	3.77
2NS 020 400	0.2	0.30	4.00	0.18	15	45	4	4.17	4.31	4.47	4.64	5.01
2NS 030 100	0.3	0.40	1.00	0.28	15	45	4	1.07	1.10	1.14	1.19	1.28
2NS 030 150	0.3	0.40	1.50	0.28	15	45	4	1.58	1.64	1.70	1.76	1.91
2NS 030 200	0.3	0.40	2.00	0.28	15	45	4	2.10	2.17	2.25	2.34	2.53
2NS 030 300	0.3	0.40	3.00	0.28	15	45	4	3.13	3.24	3.36	3.49	3.77
2NS 030 400	0.3	0.40	4.00	0.28	15	45	4	4.17	4.31	4.47	4.64	5.01
2NS 030 600	0.3	0.40	6.00	0.28	15	45	4	6.24	6.45	6.69	6.94	7.50
2NS 030 800	0.3	0.40	8.00	0.28	15	45	4	8.30	8.59	8.90	9.24	9.99
2NS 040 100	0.4	0.60	1.00	0.37	15	45	4	1.09	1.12	1.17	1.21	1.31
2NS 040 150	0.4	0.60	1.50	0.37	15	45	4	1.60	1.66	1.72	1.78	1.93
2NS 040 200	0.4	0.60	2.00	0.37	15	45	4	2.12	2.19	2.27	2.36	2.55

2날 평 리브
2F Necked Square End

2NS

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
2NS 040 250	0.4	0.60	2.50	0.37	15	45	4	2.64	2.73	2.83	2.93	3.17
2NS 040 300	0.4	0.60	3.00	0.37	15	45	4	3.15	3.26	3.38	3.51	3.79
2NS 040 350	0.4	0.60	3.50	0.37	15	45	4	3.67	3.80	3.94	4.08	4.42
2NS 040 400	0.4	0.60	4.00	0.37	15	45	4	4.19	4.33	4.49	4.66	5.04
2NS 040 500	0.4	0.60	5.00	0.37	15	45	4	5.22	5.40	5.60	5.81	6.28
2NS 040 600	0.4	0.60	6.00	0.37	15	45	4	6.25	6.47	6.71	6.96	7.52
2NS 040 800	0.4	0.60	8.00	0.37	15	45	4	8.32	8.61	8.92	9.26	10.01
2NS 040 1000	0.4	0.60	10.00	0.37	15	45	4	10.39	10.75	11.14	11.56	12.50
2NS 040 1200	0.4	0.60	12.00	0.37	15	45	4	12.46	12.89	13.36	13.86	14.98
2NS 050 100	0.5	0.70	1.00	0.47	15	45	4	1.09	1.12	1.17	1.21	1.31
2NS 050 150	0.5	0.70	1.50	0.47	15	45	4	1.60	1.66	1.72	1.78	1.93
2NS 050 200	0.5	0.70	2.00	0.47	15	45	4	2.12	2.19	2.27	2.36	2.55
2NS 050 250	0.5	0.70	2.50	0.47	15	45	4	2.64	2.73	2.83	2.93	3.17
2NS 050 300	0.5	0.70	3.00	0.47	15	45	4	3.15	3.26	3.38	3.51	3.79
2NS 050 350	0.5	0.70	3.50	0.47	15	45	4	3.67	3.80	3.94	4.08	4.42
2NS 050 400	0.5	0.70	4.00	0.47	15	45	4	4.19	4.33	4.49	4.66	5.04
2NS 050 500	0.5	0.70	5.00	0.47	15	45	4	5.22	5.40	5.60	5.81	6.28
2NS 050 600	0.5	0.70	6.00	0.47	15	45	4	6.25	6.47	6.71	6.96	7.52
2NS 050 800	0.5	0.70	8.00	0.47	15	45	4	8.32	8.61	8.92	9.26	10.01
2NS 050 1000	0.5	0.70	10.00	0.47	15	45	4	10.39	10.75	11.14	11.56	12.50
2NS 050 1200	0.5	0.70	12.00	0.47	15	45	4	12.46	12.89	13.36	13.86	14.98
2NS 060 150	0.6	0.90	1.50	0.57	15	45	4	1.60	1.66	1.72	1.78	1.93
2NS 060 200	0.6	0.90	2.00	0.57	15	45	4	2.12	2.19	2.27	2.36	2.55
2NS 060 300	0.6	0.90	3.00	0.57	15	45	4	3.15	3.26	3.38	3.51	3.79
2NS 060 400	0.6	0.90	4.00	0.57	15	45	4	4.19	4.33	4.49	4.66	5.04
2NS 060 500	0.6	0.90	5.00	0.57	15	45	4	5.22	5.40	5.60	5.81	6.28
2NS 060 600	0.6	0.90	6.00	0.57	15	45	4	6.25	6.47	6.71	6.96	7.52
2NS 060 800	0.6	0.90	8.00	0.57	15	45	4	8.32	8.61	8.92	9.26	10.01
2NS 060 1000	0.6	0.90	10.00	0.57	15	45	4	10.39	10.75	11.14	11.56	12.50
2NS 060 1200	0.6	0.90	12.00	0.57	15	45	4	12.46	12.89	13.36	13.86	14.98
2NS 060 1600	0.6	0.90	16.00	0.57	15	45	4	16.59	17.17	17.79	18.46	19.95
2NS 070 200	0.7	0.80	2.00	0.66	15	45	4	2.14	2.21	2.29	2.38	2.57
2NS 070 300	0.7	0.80	3.00	0.66	15	45	4	3.17	3.28	3.40	3.53	3.82
2NS 070 400	0.7	0.80	4.00	0.66	15	45	4	4.21	4.35	4.51	4.68	5.06
2NS 070 600	0.7	0.80	6.00	0.66	15	45	4	6.27	6.49	6.73	6.98	7.55
2NS 070 800	0.7	0.80	8.00	0.66	15	45	4	8.34	8.63	8.94	9.28	10.03
2NS 070 1000	0.7	0.80	10.00	0.66	15	45	4	10.41	10.77	11.16	11.58	12.52
2NS 080 200	0.8	1.20	2.00	0.77	15	45	4	2.12	2.19	2.27	2.36	2.55
2NS 080 300	0.8	1.20	3.00	0.77	15	45	4	3.15	3.26	3.38	3.51	3.79
2NS 080 400	0.8	1.20	4.00	0.77	15	45	4	4.19	4.33	4.49	4.66	5.04
2NS 080 500	0.8	1.20	5.00	0.77	15	45	4	5.22	5.40	5.60	5.81	6.28
2NS 080 600	0.8	1.20	6.00	0.77	15	45	4	6.25	6.47	6.71	6.96	7.52
2NS 080 800	0.8	1.20	8.00	0.77	15	45	4	8.32	8.61	8.92	9.26	10.01

2날 평 리브
2F Necked Square End

2NS

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30′	1°	1°30′	2°	3°
2NS 080 1000	0.8	1.20	10.00	0.77	15	45	4	10.39	10.75	11.14	11.56	12.50
2NS 080 1200	0.8	1.20	12.00	0.77	15	45	4	12.46	12.89	13.36	13.86	14.98
2NS 080 1600	0.8	1.20	16.00	0.77	15	45	4	16.59	17.17	17.79	18.46	19.95
2NS 080 2000	0.8	1.20	20.00	0.77	15	45	4	20.73	21.45	22.22	23.06	24.93
2NS 080 2500	0.8	1.20	25.00	0.77	15	45	4	25.89	26.80	27.76	28.81	free
2NS 090 200	0.9	1.40	2.00	0.85	15	45	4	2.16	2.23	2.32	2.40	2.60
2NS 090 400	0.9	1.40	4.00	0.85	15	45	4	4.23	4.37	4.53	4.70	5.08
2NS 090 600	0.9	1.40	6.00	0.85	15	45	4	6.29	6.51	6.75	7.00	7.57
2NS 090 800	0.9	1.40	8.00	0.85	15	45	4	8.36	8.65	8.96	9.30	10.06
2NS 090 1000	0.9	1.40	10.00	0.85	15	45	4	10.43	10.79	11.18	11.60	12.54
2NS 100 200	1	1.50	2.00	0.95	15	45	4	2.16	2.23	2.32	2.40	2.60
2NS 100 300	1	1.50	3.00	0.95	15	45	4	3.19	3.30	3.42	3.55	3.84
2NS 100 400	1	1.50	4.00	0.95	15	45	4	4.23	4.37	4.53	4.70	5.08
2NS 100 500	1	1.50	5.00	0.95	15	45	4	5.26	5.44	5.64	5.85	6.33
2NS 100 600	1	1.50	6.00	0.95	15	45	4	6.29	6.51	6.75	7.00	7.57
2NS 100 800	1	1.50	8.00	0.95	15	45	4	8.36	8.65	8.96	9.30	10.06
2NS 100 1000	1	1.50	10.00	0.95	15	45	4	10.43	10.79	11.18	11.60	12.54
2NS 100 1200	1	1.50	12.00	0.95	15	45	4	12.50	12.93	13.40	13.90	15.03
2NS 100 1400	1	1.50	14.00	0.95	15	45	4	14.56	15.07	15.61	16.20	17.52
2NS 100 1600	1	1.50	16.00	0.95	15	50	4	16.63	17.21	17.83	18.50	20.00
2NS 100 1800	1	1.50	18.00	0.95	15	50	4	18.70	19.35	20.05	20.80	22.49
2NS 100 2000	1	1.50	20.00	0.95	15	50	4	20.76	21.49	22.26	23.10	24.97
2NS 100 2500	1	1.50	25.00	0.95	15	60	4	25.93	26.84	27.81	28.85	free
2NS 100 3000	1	1.50	30.00	0.95	15	60	4	31.10	32.19	33.35	34.60	free
2NS 120 400	1.2	1.80	4.00	1.14	15	45	4	4.25	4.39	4.55	4.72	5.11
2NS 120 600	1.2	1.80	6.00	1.14	15	45	4	6.31	6.53	6.77	7.02	7.59
2NS 120 800	1.2	1.80	8.00	1.14	15	45	4	8.38	8.67	8.99	9.32	10.08
2NS 120 1000	1.2	1.80	10.00	1.14	15	45	4	10.45	10.81	11.20	11.62	12.57
2NS 120 1200	1.2	1.80	12.00	1.14	15	45	4	12.51	12.95	13.42	13.92	15.05
2NS 120 1600	1.2	1.80	16.00	1.14	15	50	4	16.65	17.23	17.85	18.52	20.02
2NS 120 2000	1.2	1.80	20.00	1.14	15	50	4	20.78	21.51	22.29	23.12	25.00
2NS 120 2500	1.2	1.80	25.00	1.14	15	60	4	25.95	26.86	27.83	28.87	free
2NS 150 400	1.5	2.30	4.00	1.44	15	45	4	4.25	4.39	4.55	4.72	5.11
2NS 150 600	1.5	2.30	6.00	1.44	15	45	4	6.31	6.53	6.77	7.02	7.59
2NS 150 800	1.5	2.30	8.00	1.44	15	45	4	8.38	8.67	8.99	9.32	10.08
2NS 150 1000	1.5	2.30	10.00	1.44	15	45	4	10.45	10.81	11.20	11.62	12.57
2NS 150 1200	1.5	2.30	12.00	1.44	15	45	4	12.51	12.95	13.42	13.92	15.05
2NS 150 1600	1.5	2.30	16.00	1.44	15	50	4	16.65	17.23	17.85	18.52	20.02
2NS 150 1800	1.5	2.30	18.00	1.44	15	50	4	18.72	19.37	20.07	20.82	22.51
2NS 150 2000	1.5	2.30	20.00	1.44	15	50	4	20.78	21.51	22.29	23.12	free
2NS 150 2500	1.5	2.30	25.00	1.44	15	60	4	25.95	26.86	27.83	28.87	free
2NS 150 3000	1.5	2.30	30.00	1.44	15	70	4	31.12	32.21	33.37	34.62	free
2NS 150 4000	1.5	2.30	40.00	1.44	15	80	4	41.46	42.90	44.45	free	free

2날 평 리브
2F Necked Square End

2NS

For Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
2NS 160 800	1.6	2.40	8.00	1.55	15	45	4	8.36	8.65	8.96	9.30	10.06
2NS 160 1000	1.6	2.40	10.00	1.55	15	45	4	10.43	10.79	11.18	11.60	12.54
2NS 160 1200	1.6	2.40	12.00	1.55	15	45	4	12.50	12.93	13.40	13.90	15.03
2NS 160 1400	1.6	2.40	14.00	1.55	15	45	4	14.56	15.07	15.61	16.20	17.52
2NS 160 1600	1.6	2.40	16.00	1.55	15	50	4	16.63	17.21	17.83	18.50	20.00
2NS 160 1800	1.6	2.40	18.00	1.55	15	50	4	18.70	19.35	20.05	20.80	22.49
2NS 160 2000	1.6	2.40	20.00	1.55	15	50	4	20.76	21.49	22.26	23.10	free
2NS 180 800	1.8	2.70	8.00	1.75	15	45	4	8.36	8.65	8.96	9.30	10.06
2NS 180 1000	1.8	2.70	10.00	1.75	15	45	4	10.43	10.79	11.18	11.60	12.54
2NS 180 1200	1.8	2.70	12.00	1.75	15	45	4	12.50	12.93	13.40	13.90	15.03
2NS 180 1400	1.8	2.70	14.00	1.75	15	45	4	14.56	15.07	15.61	16.20	17.52
2NS 180 1600	1.8	2.70	16.00	1.75	15	50	4	16.63	17.21	17.83	18.50	20.00
2NS 180 1800	1.8	2.70	18.00	1.75	15	50	4	18.70	19.35	20.05	20.80	free
2NS 180 2000	1.8	2.70	20.00	1.75	15	50	4	20.76	21.49	22.26	23.10	free
2NS 200 400	2	3.00	4.00	1.92	15	45	4	4.28	4.43	4.59	4.77	5.15
2NS 200 600	2	3.00	6.00	1.92	15	45	4	6.35	6.57	6.81	7.07	7.64
2NS 200 800	2	3.00	8.00	1.92	15	45	4	8.42	8.71	9.03	9.37	10.13
2NS 200 1000	2	3.00	10.00	1.92	15	45	4	10.49	10.85	11.24	11.67	12.61
2NS 200 1200	2	3.00	12.00	1.92	15	45	4	12.55	12.99	13.46	13.96	15.10
2NS 200 1400	2	3.00	14.00	1.92	15	45	4	14.62	15.13	15.68	16.26	17.58
2NS 200 1600	2	3.00	16.00	1.92	15	50	4	16.69	17.27	17.89	18.56	free
2NS 200 1800	2	3.00	18.00	1.92	15	50	4	18.76	19.41	20.11	20.86	free
2NS 200 2000	2	3.00	20.00	1.92	15	50	4	20.82	21.55	22.33	23.16	free
2NS 200 2500	2	3.00	25.00	1.92	15	60	4	25.99	26.90	27.87	free	free
2NS 200 3000	2	3.00	30.00	1.92	15	70	4	31.16	32.25	33.41	free	free
2NS 200 4000	2	3.00	40.00	1.92	15	80	4	41.50	42.94	free	free	free
2NS 250 1000	2.5	3.70	10.00	2.39	15	45	4	10.54	10.91	11.31	11.73	12.68
2NS 250 1200	2.5	3.70	12.00	2.39	15	45	4	12.61	13.05	13.52	14.03	free
2NS 250 1600	2.5	3.70	16.00	2.39	15	50	4	16.75	17.33	17.96	18.63	free
2NS 250 2000	2.5	3.70	20.00	2.39	15	50	4	20.88	21.61	22.39	free	free
2NS 250 2500	2.5	3.70	25.00	2.39	15	60	4	26.05	26.96	27.93	free	free
2NS 250 3000	2.5	3.70	30.00	2.39	15	70	4	31.22	32.31	free	free	free
2NS 300 800	3	4.50	8.00	2.86	15	50	6	8.53	8.83	9.15	9.49	10.26
2NS 300 1000	3	4.50	10.00	2.86	15	50	6	10.60	10.97	11.37	11.79	12.75
2NS 300 1200	3	4.50	12.00	2.86	15	50	6	12.67	13.11	13.58	14.09	15.24
2NS 300 1600	3	4.50	16.00	2.86	15	60	6	16.80	17.39	18.02	18.69	20.21
2NS 300 2000	3	4.50	20.00	2.86	15	60	6	20.94	21.67	22.45	23.29	25.18
2NS 300 2500	3	4.50	25.00	2.86	15	60	6	26.11	27.02	27.99	29.04	free
2NS 300 3000	3	4.50	30.00	2.86	15	70	6	31.28	32.36	33.53	34.79	free
2NS 300 3500	3	4.50	35.00	2.86	15	70	6	36.44	37.71	39.08	40.54	free
2NS 300 4000	3	4.50	40.00	2.86	15	80	6	41.61	43.06	44.62	free	free
2NS 400 1200	4	6.00	12.00	3.80	15	50	6	12.78	13.23	13.71	14.22	15.38
2NS 400 1400	4	6.00	14.00	3.80	15	50	6	14.85	15.37	15.93	16.52	17.86

2날 평 리브
2F Necked Square End

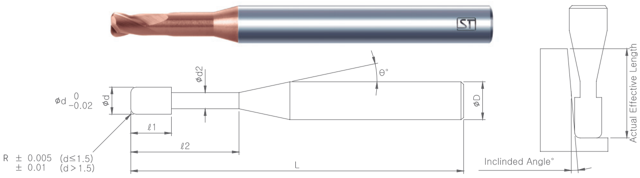
2NS

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30′	1°	1°30′	2°	3°
2NS 400 1600	4	6.00	16.00	3.80	15	60	6	16.92	17.51	18.14	18.82	free
2NS 400 2000	4	6.00	20.00	3.80	15	60	6	21.05	21.79	22.57	23.42	free
2NS 400 2500	4	6.00	25.00	3.80	15	60	6	26.22	27.14	28.12	free	free
2NS 400 3000	4	6.00	30.00	3.80	15	70	6	31.39	32.48	33.66	free	free
2NS 400 3500	4	6.00	35.00	3.80	15	70	6	36.56	37.83	free	free	free
2NS 400 4000	4	6.00	40.00	3.80	15	80	6	41.73	43.18	free	free	free
2NS 400 5000	4	6.00	50.00	3.80	15	100	6	52.06	53.88	free	free	free
2NS 500 1600	5	7.50	16.00	4.75	15	60	6	17.02	17.61	18.25	free	free
2NS 500 2000	5	7.50	20.00	4.75	15	60	6	21.15	21.89	free	free	free
2NS 500 2500	5	7.50	25.00	4.75	15	60	6	26.32	27.24	free	free	free
2NS 500 3000	5	7.50	30.00	4.75	15	70	6	31.49	free	free	free	free
2NS 500 3500	5	7.50	35.00	4.75	15	70	6	36.66	free	free	free	free
2NS 500 4000	5	7.50	40.00	4.75	15	80	6	41.82	free	free	free	free
2NS 500 5000	5	7.50	50.00	4.75	15	100	6	52.16	free	free	free	free
2NS 600 1500	6	9.00	15.00	5.70	-	60	6	free	free	free	free	free
2NS 600 2000	6	9.00	20.00	5.70	-	60	6	free	free	free	free	free
2NS 600 3000	6	9.00	30.00	5.70	-	70	6	free	free	free	free	free
2NS 600 4000	6	9.00	40.00	5.70	-	80	6	free	free	free	free	free
2NS 800 2000	8	12.00	20.00	7.60	-	80	8	free	free	free	free	free
2NS 800 3000	8	12.00	30.00	7.60	-	80	8	free	free	free	free	free
2NS 800 4000	8	12.00	40.00	7.60	-	100	8	free	free	free	free	free

2날 코너 R 리브
2F Necked Corner Radius
2NC

2 | HX30° | M/G Carbide | AlTiSiN Coated



Features
- Extended neck style for long reach applications
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 롱 넥 형상으로 깊은 가공에 적합함
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NC 020 R002 050	0.2 X R0.02	0.15	0.50	0.18	15	45	4	0.55	0.57	0.59	0.61	0.66
2NC 020 R002 100	0.2 X R0.02	0.15	1.00	0.18	15	45	4	1.07	1.10	1.14	1.18	1.28
2NC 020 R002 200	0.2 X R0.02	0.15	2.00	0.18	15	45	4	2.10	2.17	2.25	2.33	2.52
2NC 020 R005 050	0.2 X R0.05	0.15	0.50	0.18	15	45	4	0.55	0.57	0.59	0.61	0.65
2NC 020 R005 100	0.2 X R0.05	0.15	1.00	0.18	15	45	4	1.07	1.10	1.14	1.18	1.27
2NC 020 R005 150	0.2 X R0.05	0.15	1.50	0.18	15	45	4	1.58	1.64	1.69	1.76	1.89
2NC 020 R005 200	0.2 X R0.05	0.15	2.00	0.18	15	45	4	2.10	2.17	2.25	2.33	2.52
2NC 030 R002 100	0.3 X R0.02	0.25	1.00	0.28	15	45	4	1.07	1.10	1.14	1.18	1.28
2NC 030 R002 200	0.3 X R0.02	0.25	2.00	0.28	15	45	4	2.10	2.17	2.25	2.33	2.52
2NC 030 R002 300	0.3 X R0.02	0.25	3.00	0.28	15	45	4	3.13	3.24	3.36	3.48	3.77
2NC 030 R005 100	0.3 X R0.05	0.25	1.00	0.28	15	45	4	1.07	1.10	1.14	1.18	1.27
2NC 030 R005 150	0.3 X R0.05	0.25	1.50	0.28	15	45	4	1.58	1.64	1.69	1.76	1.89
2NC 030 R005 200	0.3 X R0.05	0.25	2.00	0.28	15	45	4	2.10	2.17	2.25	2.33	2.52
2NC 030 R005 250	0.3 X R0.05	0.25	2.50	0.28	15	45	4	2.62	2.71	2.80	2.91	3.14
2NC 030 R005 300	0.3 X R0.05	0.25	3.00	0.28	15	45	4	3.13	3.24	3.36	3.48	3.76
2NC 040 R002 100	0.4 X R0.02	0.30	1.00	0.37	15	45	4	1.09	1.12	1.16	1.21	1.30
2NC 040 R002 200	0.4 X R0.02	0.30	2.00	0.37	15	45	4	2.12	2.19	2.27	2.36	2.55
2NC 040 R002 300	0.4 X R0.02	0.30	3.00	0.37	15	45	4	3.15	3.26	3.38	3.51	3.79
2NC 040 R002 400	0.4 X R0.02	0.30	4.00	0.37	15	45	4	4.19	4.33	4.49	4.66	5.03
2NC 040 R005 100	0.4 X R0.05	0.30	1.00	0.37	15	45	4	1.08	1.12	1.16	1.20	1.30
2NC 040 R005 200	0.4 X R0.05	0.30	2.00	0.37	15	45	4	2.12	2.19	2.27	2.35	2.54
2NC 040 R005 300	0.4 X R0.05	0.30	3.00	0.37	15	45	4	3.15	3.26	3.38	3.50	3.78

2NC

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	섕크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NC 040 R005 400	0.4 X R0.05	0.30	4.00	0.37	15	45	4	4.19	4.33	4.48	4.65	5.03
2NC 040 R010 100	0.4 X R0.1	0.30	1.00	0.37	15	45	4	1.08	1.12	1.15	1.19	1.28
2NC 040 R010 200	0.4 X R0.1	0.30	2.00	0.37	15	45	4	2.12	2.19	2.26	2.34	2.53
2NC 040 R010 300	0.4 X R0.1	0.30	3.00	0.37	15	45	4	3.15	3.26	3.37	3.49	3.77
2NC 040 R010 400	0.4 X R0.1	0.30	4.00	0.37	15	45	4	4.18	4.33	4.48	4.64	5.01
2NC 050 R002 100	0.5 X R0.02	0.40	1.00	0.47	15	45	4	1.09	1.12	1.16	1.21	1.30
2NC 050 R002 200	0.5 X R0.02	0.40	2.00	0.47	15	45	4	2.12	2.19	2.27	2.36	2.55
2NC 050 R002 300	0.5 X R0.02	0.40	3.00	0.47	15	45	4	3.15	3.26	3.38	3.51	3.79
2NC 050 R002 400	0.5 X R0.02	0.40	4.00	0.47	15	45	4	4.19	4.33	4.49	4.66	5.03
2NC 050 R002 500	0.5 X R0.02	0.40	5.00	0.47	15	45	4	5.22	5.40	5.60	5.81	6.28
2NC 050 R005 100	0.5 X R0.05	0.40	1.00	0.47	15	45	4	1.08	1.12	1.16	1.20	1.30
2NC 050 R005 200	0.5 X R0.05	0.40	2.00	0.47	15	45	4	2.12	2.19	2.27	2.35	2.54
2NC 050 R005 300	0.5 X R0.05	0.40	3.00	0.47	15	45	4	3.15	3.26	3.38	3.50	3.78
2NC 050 R005 400	0.5 X R0.05	0.40	4.00	0.47	15	45	4	4.19	4.33	4.48	4.65	5.03
2NC 050 R005 500	0.5 X R0.05	0.40	5.00	0.47	15	45	4	5.22	5.40	5.59	5.80	6.27
2NC 050 R010 100	0.5 X R0.1	0.40	1.00	0.47	15	45	4	1.08	1.12	1.15	1.19	1.28
2NC 050 R010 200	0.5 X R0.1	0.40	2.00	0.47	15	45	4	2.12	2.19	2.26	2.34	2.53
2NC 050 R010 300	0.5 X R0.1	0.40	3.00	0.47	15	45	4	3.15	3.26	3.37	3.49	3.77
2NC 050 R010 400	0.5 X R0.1	0.40	4.00	0.47	15	45	4	4.18	4.33	4.48	4.64	5.01
2NC 050 R010 500	0.5 X R0.1	0.40	5.00	0.47	15	45	4	5.22	5.40	5.59	5.79	6.26
2NC 060 R002 200	0.6 X R0.02	0.50	2.00	0.57	15	45	4	2.12	2.19	2.27	2.36	2.55
2NC 060 R002 400	0.6 X R0.02	0.50	4.00	0.57	15	45	4	4.19	4.33	4.49	4.66	5.03
2NC 060 R002 600	0.6 X R0.02	0.50	6.00	0.57	15	45	4	6.25	6.47	6.70	6.96	7.52
2NC 060 R005 200	0.6 X R0.05	0.50	2.00	0.57	15	45	4	2.12	2.19	2.27	2.35	2.54
2NC 060 R005 400	0.6 X R0.05	0.50	4.00	0.57	15	45	4	4.19	4.33	4.48	4.65	5.03
2NC 060 R005 600	0.6 X R0.05	0.50	6.00	0.57	15	45	4	6.25	6.47	6.70	6.95	7.51
2NC 060 R010 200	0.6 X R0.1	0.50	2.00	0.57	15	45	4	2.12	2.19	2.26	2.34	2.53
2NC 060 R010 400	0.6 X R0.1	0.50	4.00	0.57	15	45	4	4.18	4.33	4.48	4.64	5.01
2NC 060 R010 600	0.6 X R0.1	0.50	6.00	0.57	15	45	4	6.25	6.47	6.70	6.94	7.50
2NC 070 R005 400	0.7 X R0.05	0.55	4.00	0.66	15	45	4	4.21	4.35	4.51	4.67	5.05
2NC 070 R005 600	0.7 X R0.05	0.55	6.00	0.66	15	45	4	6.27	6.49	6.72	6.97	7.53
2NC 070 R010 400	0.7 X R0.1	0.55	4.00	0.66	15	45	4	4.20	4.35	4.50	4.67	5.04
2NC 070 R010 600	0.7 X R0.1	0.55	6.00	0.66	15	45	4	6.27	6.49	6.72	6.96	7.52
2NC 080 R002 200	0.8 X R0.02	0.65	2.00	0.77	15	45	4	2.12	2.19	2.27	2.36	2.55
2NC 080 R002 400	0.8 X R0.02	0.65	4.00	0.77	15	45	4	4.19	4.33	4.49	4.66	5.03
2NC 080 R002 600	0.8 X R0.02	0.65	6.00	0.77	15	45	4	6.25	6.47	6.70	6.96	7.52
2NC 080 R002 800	0.8 X R0.02	0.65	8.00	0.77	15	45	4	8.32	8.61	8.92	9.26	10.00
2NC 080 R005 200	0.8 X R0.05	0.65	2.00	0.77	15	45	4	2.12	2.19	2.27	2.35	2.54
2NC 080 R005 400	0.8 X R0.05	0.65	4.00	0.77	15	45	4	4.19	4.33	4.48	4.65	5.03
2NC 080 R005 600	0.8 X R0.05	0.65	6.00	0.77	15	45	4	6.25	6.47	6.70	6.95	7.51
2NC 080 R005 800	0.8 X R0.05	0.65	8.00	0.77	15	45	4	8.32	8.61	8.92	9.25	10.00
2NC 080 R010 200	0.8 X R0.1	0.65	2.00	0.77	15	45	4	2.12	2.19	2.26	2.34	2.53
2NC 080 R010 400	0.8 X R0.1	0.65	4.00	0.77	15	45	4	4.18	4.33	4.48	4.64	5.01

2NC

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
2NC 080 R010 600	0.8 X R0.1	0.65	6.00	0.77	15	45	4	6.25	6.47	6.70	6.94	7.50
2NC 080 R010 800	0.8 X R0.1	0.65	8.00	0.77	15	45	4	8.32	8.61	8.91	9.24	9.99
2NC 080 R020 200	0.8 X R0.2	0.65	2.00	0.77	15	45	4	2.11	2.18	2.25	2.33	2.50
2NC 080 R020 400	0.8 X R0.2	0.65	4.00	0.77	15	45	4	4.18	4.32	4.47	4.63	4.99
2NC 080 R020 600	0.8 X R0.2	0.65	6.00	0.77	15	45	4	6.25	6.46	6.69	6.93	7.47
2NC 080 R020 800	0.8 X R0.2	0.65	8.00	0.77	15	45	4	8.32	8.60	8.90	9.23	9.96
2NC 090 R010 400	0.9 X R0.1	0.70	4.00	0.85	15	45	4	4.22	4.37	4.52	4.69	5.06
2NC 090 R010 800	0.9 X R0.1	0.70	8.00	0.85	15	45	4	8.36	8.65	8.95	9.29	10.03
2NC 100 R002 200	1.0 X R0.02	0.80	2.00	0.95	15	45	4	2.16	2.23	2.31	2.40	2.59
2NC 100 R002 400	1.0 X R0.02	0.80	4.00	0.95	15	45	4	4.23	4.37	4.53	4.70	5.08
2NC 100 R002 600	1.0 X R0.02	0.80	6.00	0.95	15	45	4	6.29	6.51	6.75	7.00	7.56
2NC 100 R002 800	1.0 X R0.02	0.80	8.00	0.95	15	45	4	8.36	8.65	8.96	9.30	10.05
2NC 100 R002 1000	1.0 X R0.02	0.80	10.00	0.95	15	45	4	10.43	10.79	11.18	11.60	12.54
2NC 100 R005 200	1.0 X R0.05	0.80	2.00	0.95	15	45	4	2.16	2.23	2.31	2.39	2.59
2NC 100 R005 400	1.0 X R0.05	0.80	4.00	0.95	15	45	4	4.22	4.37	4.53	4.69	5.07
2NC 100 R005 600	1.0 X R0.05	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.56
2NC 100 R005 800	1.0 X R0.05	0.80	8.00	0.95	15	45	4	8.36	8.65	8.96	9.29	10.04
2NC 100 R005 1000	1.0 X R0.05	0.80	10.00	0.95	15	45	4	10.43	10.79	11.18	11.59	12.53
2NC 100 R005 1200	1.0 X R0.05	0.80	12.00	0.95	15	45	4	12.49	12.93	13.39	13.89	15.02
2NC 100 R005 1600	1.0 X R0.05	0.80	16.00	0.95	15	50	4	16.63	17.21	17.83	18.49	19.99
2NC 100 R005 2000	1.0 X R0.05	0.80	20.00	0.95	15	50	4	20.76	21.48	22.26	23.09	24.96
2NC 100 R010 200	1.0 X R0.1	0.80	2.00	0.95	15	45	4	2.16	2.23	2.30	2.39	2.57
2NC 100 R010 400	1.0 X R0.1	0.80	4.00	0.95	15	45	4	4.22	4.37	4.52	4.69	5.06
2NC 100 R010 600	1.0 X R0.1	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.55
2NC 100 R010 800	1.0 X R0.1	0.80	8.00	0.95	15	45	4	8.36	8.65	8.95	9.29	10.03
2NC 100 R010 1000	1.0 X R0.1	0.80	10.00	0.95	15	45	4	10.42	10.78	11.17	11.59	12.52
2NC 100 R010 1200	1.0 X R0.1	0.80	12.00	0.95	15	45	4	12.49	12.92	13.39	13.89	15.00
2NC 100 R010 1600	1.0 X R0.1	0.80	16.00	0.95	15	50	4	16.63	17.20	17.82	18.48	19.98
2NC 100 R010 2000	1.0 X R0.1	0.80	20.00	0.95	15	50	4	20.76	21.48	22.25	23.08	24.95
2NC 100 R020 200	1.0 X R0.2	0.80	2.00	0.95	15	45	4	2.15	2.22	2.29	2.37	2.55
2NC 100 R020 400	1.0 X R0.2	0.80	4.00	0.95	15	45	4	4.22	4.36	4.51	4.67	5.03
2NC 100 R020 600	1.0 X R0.2	0.80	6.00	0.95	15	45	4	6.29	6.50	6.73	6.97	7.52
2NC 100 R020 800	1.0 X R0.2	0.80	8.00	0.95	15	45	4	8.35	8.64	8.94	9.27	10.01
2NC 100 R020 1000	1.0 X R0.2	0.80	10.00	0.95	15	45	4	10.42	10.78	11.16	11.57	12.49
2NC 100 R020 1200	1.0 X R0.2	0.80	12.00	0.95	15	45	4	12.49	12.92	13.38	13.87	14.98
2NC 100 R020 1600	1.0 X R0.2	0.80	16.00	0.95	15	50	4	16.62	17.20	17.81	18.47	19.95
2NC 100 R020 2000	1.0 X R0.2	0.80	20.00	0.95	15	50	4	20.76	21.47	22.24	23.07	24.93
2NC 100 R030 200	1.0 X R0.3	0.80	2.00	0.95	15	45	4	2.15	2.21	2.28	2.36	2.52
2NC 100 R030 400	1.0 X R0.3	0.80	4.00	0.95	15	45	4	4.22	4.35	4.50	4.66	5.01
2NC 100 R030 600	1.0 X R0.3	0.80	6.00	0.95	15	45	4	6.28	6.49	6.72	6.96	7.50
2NC 100 R030 800	1.0 X R0.3	0.80	8.00	0.95	15	45	4	8.35	8.63	8.93	9.26	9.98
2NC 100 R030 1000	1.0 X R0.3	0.80	10.00	0.95	15	45	4	10.42	10.77	11.15	11.56	12.47
2NC 100 R030 1200	1.0 X R0.3	0.80	12.00	0.95	15	45	4	12.49	12.91	13.37	13.86	14.96

2날 코너 R 리브
2F Necked Corner Radius
2NC

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	섕크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
2NC 100 R030 1600	1.0 X R0.3	0.80	16.00	0.95	15	50	4	16.62	17.19	17.80	18.46	19.93
2NC 100 R030 2000	1.0 X R0.3	0.80	20.00	0.95	15	50	4	20.75	21.47	22.23	23.05	24.90
2NC 120 R010 400	1.2 X R0.1	1.00	4.00	1.14	15	45	4	4.24	4.39	4.54	4.71	5.08
2NC 120 R010 600	1.2 X R0.1	1.00	6.00	1.14	15	45	4	6.31	6.53	6.76	7.01	7.57
2NC 120 R010 1000	1.2 X R0.1	1.00	10.00	1.14	15	50	4	10.44	10.80	11.19	11.61	12.54
2NC 120 R020 400	1.2 X R0.2	1.00	4.00	1.14	15	45	4	4.24	4.38	4.53	4.69	5.06
2NC 120 R020 600	1.2 X R0.2	1.00	6.00	1.14	15	45	4	6.31	6.52	6.75	6.99	7.54
2NC 120 R020 1000	1.2 X R0.2	1.00	10.00	1.14	15	50	4	10.44	10.80	11.18	11.59	12.52
2NC 120 R030 400	1.2 X R0.3	1.00	4.00	1.14	15	45	4	4.24	4.37	4.52	4.68	5.03
2NC 120 R030 600	1.2 X R0.3	1.00	6.00	1.14	15	45	4	6.30	6.51	6.74	6.98	7.52
2NC 120 R030 1000	1.2 X R0.3	1.00	10.00	1.14	15	50	4	10.44	10.79	11.17	11.58	12.49
2NC 150 R005 300	1.5 X R0.05	1.50	3.00	1.44	15	45	4	3.21	3.32	3.44	3.57	3.85
2NC 150 R005 400	1.5 X R0.05	1.50	4.00	1.44	15	45	4	4.24	4.39	4.55	4.72	5.09
2NC 150 R005 600	1.5 X R0.05	1.50	6.00	1.44	15	45	4	6.31	6.53	6.76	7.02	7.58
2NC 150 R005 800	1.5 X R0.05	1.50	8.00	1.44	15	45	4	8.38	8.67	8.98	9.32	10.07
2NC 150 R005 1000	1.5 X R0.05	1.50	10.00	1.44	15	45	4	10.45	10.81	11.20	11.61	12.55
2NC 150 R005 1200	1.5 X R0.05	1.50	12.00	1.44	15	45	4	12.51	12.95	13.41	13.91	15.04
2NC 150 R005 1600	1.5 X R0.05	1.50	16.00	1.44	15	50	4	16.65	17.23	17.85	18.51	20.01
2NC 150 R005 2000	1.5 X R0.05	1.50	20.00	1.44	15	50	4	20.78	21.50	22.28	23.11	free
2NC 150 R010 300	1.5 X R0.1	1.50	3.00	1.44	15	45	4	3.21	3.32	3.43	3.56	3.84
2NC 150 R010 400	1.5 X R0.1	1.50	4.00	1.44	15	45	4	4.24	4.39	4.54	4.71	5.08
2NC 150 R010 600	1.5 X R0.1	1.50	6.00	1.44	15	45	4	6.31	6.53	6.76	7.01	7.57
2NC 150 R010 800	1.5 X R0.1	1.50	8.00	1.44	15	45	4	8.38	8.67	8.97	9.31	10.06
2NC 150 R010 1000	1.5 X R0.1	1.50	10.00	1.44	15	45	4	10.44	10.80	11.19	11.61	12.54
2NC 150 R010 1200	1.5 X R0.1	1.50	12.00	1.44	15	45	4	12.51	12.94	13.41	13.91	15.03
2NC 150 R010 1600	1.5 X R0.1	1.50	16.00	1.44	15	50	4	16.65	17.22	17.84	18.51	20.00
2NC 150 R010 2000	1.5 X R0.1	1.50	20.00	1.44	15	50	4	20.78	21.50	22.27	23.11	free
2NC 150 R020 300	1.5 X R0.2	1.50	3.00	1.44	15	45	4	3.20	3.31	3.42	3.54	3.81
2NC 150 R020 400	1.5 X R0.2	1.50	4.00	1.44	15	45	4	4.24	4.38	4.53	4.69	5.06
2NC 150 R020 600	1.5 X R0.2	1.50	6.00	1.44	15	45	4	6.31	6.52	6.75	6.99	7.54
2NC 150 R020 800	1.5 X R0.2	1.50	8.00	1.44	15	45	4	8.37	8.66	8.96	9.29	10.03
2NC 150 R020 1000	1.5 X R0.2	1.50	10.00	1.44	15	45	4	10.44	10.80	11.18	11.59	12.52
2NC 150 R020 1200	1.5 X R0.2	1.50	12.00	1.44	15	45	4	12.51	12.94	13.40	13.89	15.00
2NC 150 R020 1600	1.5 X R0.2	1.50	16.00	1.44	15	50	4	16.64	17.22	17.83	18.49	19.98
2NC 150 R020 2000	1.5 X R0.2	1.50	20.00	1.44	15	50	4	20.78	21.49	22.26	23.09	free
2NC 150 R030 300	1.5 X R0.3	1.50	3.00	1.44	15	45	4	3.20	3.30	3.41	3.53	3.79
2NC 150 R030 400	1.5 X R0.3	1.50	4.00	1.44	15	45	4	4.24	4.37	4.52	4.68	5.03
2NC 150 R030 600	1.5 X R0.3	1.50	6.00	1.44	15	45	4	6.30	6.51	6.74	6.98	7.52
2NC 150 R030 800	1.5 X R0.3	1.50	8.00	1.44	15	45	4	8.37	8.65	8.95	9.28	10.01
2NC 150 R030 1000	1.5 X R0.3	1.50	10.00	1.44	15	45	4	10.44	10.79	11.17	11.58	12.49
2NC 150 R030 1200	1.5 X R0.3	1.50	12.00	1.44	15	45	4	12.50	12.93	13.39	13.88	14.98
2NC 150 R030 1600	1.5 X R0.3	1.50	16.00	1.44	15	50	4	16.64	17.21	17.82	18.48	19.95
2NC 150 R030 2000	1.5 X R0.3	1.50	20.00	1.44	15	50	4	20.77	21.49	22.25	23.08	free

2날 코너 R 리브
2F Necked Corner Radius

2NC

For Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NC 150 R050 300	1.5 X R0.5	1.50	3.00	1.44	15	45	4	3.19	3.29	3.39	3.50	3.74
2NC 150 R050 400	1.5 X R0.5	1.50	4.00	1.44	15	45	4	4.23	4.36	4.50	4.65	4.99
2NC 150 R050 600	1.5 X R0.5	1.50	6.00	1.44	15	45	4	6.30	6.50	6.71	6.95	7.47
2NC 150 R050 800	1.5 X R0.5	1.50	8.00	1.44	15	45	4	8.36	8.64	8.93	9.25	9.96
2NC 150 R050 1000	1.5 X R0.5	1.50	10.00	1.44	15	45	4	10.43	10.78	11.15	11.55	12.44
2NC 150 R050 1200	1.5 X R0.5	1.50	12.00	1.44	15	45	4	12.50	12.92	13.36	13.85	14.93
2NC 150 R050 1600	1.5 X R0.5	1.50	16.00	1.44	15	50	4	16.63	17.19	17.80	18.45	19.90
2NC 150 R050 2000	1.5 X R0.5	1.50	20.00	1.44	15	50	4	20.77	21.47	22.23	23.05	free
2NC 200 R005 400	2.0 X R0.05	1.70	4.00	1.92	15	45	4	4.28	4.43	4.59	4.76	5.14
2NC 200 R005 600	2.0 X R0.05	1.70	6.00	1.92	15	45	4	6.35	6.57	6.80	7.06	7.63
2NC 200 R005 800	2.0 X R0.05	1.70	8.00	1.92	15	45	4	8.42	8.71	9.02	9.36	10.11
2NC 200 R005 1000	2.0 X R0.05	1.70	10.00	1.92	15	45	4	10.48	10.85	11.24	11.66	12.60
2NC 200 R005 1200	2.0 X R0.05	1.70	12.00	1.92	15	45	4	12.55	12.99	13.45	13.96	15.09
2NC 200 R005 1600	2.0 X R0.05	1.70	16.00	1.92	15	50	4	16.69	17.27	17.89	18.56	free
2NC 200 R005 2000	2.0 X R0.05	1.70	20.00	1.92	15	50	4	20.82	21.54	22.32	23.16	free
2NC 200 R010 400	2.0 X R0.1	1.70	4.00	1.92	15	45	4	4.28	4.43	4.58	4.75	5.13
2NC 200 R010 600	2.0 X R0.1	1.70	6.00	1.92	15	45	4	6.35	6.57	6.80	7.05	7.62
2NC 200 R010 800	2.0 X R0.1	1.70	8.00	1.92	15	45	4	8.42	8.71	9.02	9.35	10.10
2NC 200 R010 1000	2.0 X R0.1	1.70	10.00	1.92	15	45	4	10.48	10.84	11.23	11.65	12.59
2NC 200 R010 1200	2.0 X R0.1	1.70	12.00	1.92	15	45	4	12.55	12.98	13.45	13.95	15.07
2NC 200 R010 1600	2.0 X R0.1	1.70	16.00	1.92	15	50	4	16.68	17.26	17.88	18.55	free
2NC 200 R010 2000	2.0 X R0.1	1.70	20.00	1.92	15	50	4	20.82	21.54	22.32	23.15	free
2NC 200 R020 400	2.0 X R0.2	1.70	4.00	1.92	15	45	4	4.28	4.42	4.57	4.74	5.10
2NC 200 R020 600	2.0 X R0.2	1.70	6.00	1.92	15	45	4	6.34	6.56	6.79	7.04	7.59
2NC 200 R020 800	2.0 X R0.2	1.70	8.00	1.92	15	45	4	8.41	8.70	9.01	9.34	10.08
2NC 200 R020 1000	2.0 X R0.2	1.70	10.00	1.92	15	45	4	10.48	10.84	11.22	11.64	12.56
2NC 200 R020 1200	2.0 X R0.2	1.70	12.00	1.92	15	45	4	12.55	12.98	13.44	13.93	15.05
2NC 200 R020 1600	2.0 X R0.2	1.70	16.00	1.92	15	50	4	16.68	17.26	17.87	18.53	free
2NC 200 R020 2000	2.0 X R0.2	1.70	20.00	1.92	15	50	4	20.82	21.53	22.31	23.13	free
2NC 200 R030 400	2.0 X R0.3	1.70	4.00	1.92	15	45	4	4.27	4.41	4.56	4.72	5.08
2NC 200 R030 600	2.0 X R0.3	1.70	6.00	1.92	15	45	4	6.34	6.55	6.78	7.02	7.57
2NC 200 R030 800	2.0 X R0.3	1.70	8.00	1.92	15	45	4	8.41	8.69	8.99	9.32	10.05
2NC 200 R030 1000	2.0 X R0.3	1.70	10.00	1.92	15	45	4	10.48	10.83	11.21	11.62	12.54
2NC 200 R030 1200	2.0 X R0.3	1.70	12.00	1.92	15	45	4	12.54	12.97	13.43	13.92	15.03
2NC 200 R030 1600	2.0 X R0.3	1.70	16.00	1.92	15	50	4	16.68	17.25	17.86	18.52	free
2NC 200 R030 2000	2.0 X R0.3	1.70	20.00	1.92	15	50	4	20.81	21.53	22.29	23.12	free
2NC 200 R050 400	2.0 X R0.5	1.70	4.00	1.92	15	45	4	4.27	4.40	4.54	4.69	5.03
2NC 200 R050 600	2.0 X R0.5	1.70	6.00	1.92	15	45	4	6.33	6.54	6.76	6.99	7.52
2NC 200 R050 800	2.0 X R0.5	1.70	8.00	1.92	15	45	4	8.40	8.68	8.97	9.29	10.00
2NC 200 R050 1000	2.0 X R0.5	1.70	10.00	1.92	15	45	4	10.47	10.82	11.19	11.59	12.49
2NC 200 R050 1200	2.0 X R0.5	1.70	12.00	1.92	15	45	4	12.54	12.96	13.41	13.89	14.98
2NC 200 R050 1600	2.0 X R0.5	1.70	16.00	1.92	15	50	4	16.67	17.23	17.84	18.49	free
2NC 200 R050 2000	2.0 X R0.5	1.70	20.00	1.92	15	50	4	20.81	21.51	22.27	23.09	free

2날 코너 R 리브
2F Necked Corner Radius

2NC

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle ϴ°	전장 Overall Length L	섕크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NC 250 R010 1000	2.5 X R0.1	2.00	10.00	2.39	15	50	4	10.54	10.90	11.29	11.71	12.66
2NC 250 R010 2000	2.5 X R0.1	2.00	20.00	2.39	15	60	4	20.88	21.60	22.38	free	free
2NC 250 R010 3000	2.5 X R0.1	2.00	30.00	2.39	15	70	4	31.21	32.30	free	free	free
2NC 250 R020 1000	2.5 X R0.2	2.00	10.00	2.39	15	50	4	10.54	10.90	11.28	11.70	12.63
2NC 250 R020 2000	2.5 X R0.2	2.00	20.00	2.39	15	60	4	20.87	21.59	22.37	free	free
2NC 250 R020 3000	2.5 X R0.2	2.00	30.00	2.39	15	70	4	31.21	32.29	free	free	free
2NC 250 R030 1000	2.5 X R0.3	2.00	10.00	2.39	15	50	4	10.53	10.89	11.27	11.68	12.61
2NC 250 R030 2000	2.5 X R0.3	2.00	20.00	2.39	15	60	4	20.87	21.59	22.36	free	free
2NC 250 R030 3000	2.5 X R0.3	2.00	30.00	2.39	15	70	4	31.21	32.28	free	free	free
2NC 250 R050 1000	2.5 X R0.5	2.00	10.00	2.39	15	50	4	10.53	10.88	11.25	11.65	12.56
2NC 250 R050 2000	2.5 X R0.5	2.00	20.00	2.39	15	60	4	20.86	21.57	22.33	free	free
2NC 250 R050 3000	2.5 X R0.5	2.00	30.00	2.39	15	70	4	31.20	32.27	free	free	free
2NC 300 R005 400	3.0 X R0.05	2.50	4.00	2.86	15	50	6	4.40	4.55	4.71	4.89	5.28
2NC 300 R005 600	3.0 X R0.05	2.50	6.00	2.86	15	50	6	6.47	6.69	6.93	7.19	7.77
2NC 300 R005 800	3.0 X R0.05	2.50	8.00	2.86	15	50	6	8.53	8.83	9.15	9.49	10.25
2NC 300 R005 1000	3.0 X R0.05	2.50	10.00	2.86	15	50	6	10.60	10.97	11.36	11.79	12.74
2NC 300 R005 1200	3.0 X R0.05	2.50	12.00	2.86	15	50	6	12.67	13.11	13.58	14.09	15.23
2NC 300 R005 1600	3.0 X R0.05	2.50	16.00	2.86	15	60	6	16.80	17.39	18.01	18.69	20.20
2NC 300 R005 2000	3.0 X R0.05	2.50	20.00	2.86	15	60	6	20.94	21.66	22.45	23.29	25.17
2NC 300 R010 400	3.0 X R0.1	2.50	4.00	2.86	15	50	6	4.40	4.55	4.71	4.88	5.27
2NC 300 R010 600	3.0 X R0.1	2.50	6.00	2.86	15	50	6	6.46	6.69	6.92	7.18	7.75
2NC 300 R010 800	3.0 X R0.1	2.50	8.00	2.86	15	50	6	8.53	8.82	9.14	9.48	10.24
2NC 300 R010 1000	3.0 X R0.1	2.50	10.00	2.86	15	50	6	10.60	10.96	11.36	11.78	12.73
2NC 300 R010 1200	3.0 X R0.1	2.50	12.00	2.86	15	50	6	12.67	13.10	13.57	14.08	15.21
2NC 300 R010 1600	3.0 X R0.1	2.50	16.00	2.86	15	60	6	16.80	17.38	18.01	18.68	20.19
2NC 300 R010 2000	3.0 X R0.1	2.50	20.00	2.86	15	60	6	20.93	21.66	22.44	23.28	25.16
2NC 300 R010 2500	3.0 X R0.1	2.50	25.00	2.86	15	60	6	26.10	27.01	27.98	29.03	free
2NC 300 R010 3000	3.0 X R0.1	2.50	30.00	2.86	15	70	6	31.27	32.36	33.52	34.78	free
2NC 300 R010 3500	3.0 X R0.1	2.50	35.00	2.86	15	75	6	36.44	37.71	39.06	40.53	free
2NC 300 R020 400	3.0 X R0.2	2.50	4.00	2.86	15	50	6	4.39	4.54	4.70	4.86	5.24
2NC 300 R020 600	3.0 X R0.2	2.50	6.00	2.86	15	50	6	6.46	6.68	6.91	7.16	7.73
2NC 300 R020 800	3.0 X R0.2	2.50	8.00	2.86	15	50	6	8.53	8.82	9.13	9.46	10.22
2NC 300 R020 1000	3.0 X R0.2	2.50	10.00	2.86	15	50	6	10.59	10.96	11.35	11.76	12.70
2NC 300 R020 1200	3.0 X R0.2	2.50	12.00	2.86	15	50	6	12.66	13.10	13.56	14.06	15.19
2NC 300 R020 1600	3.0 X R0.2	2.50	16.00	2.86	15	60	6	16.80	17.38	18.00	18.66	20.16
2NC 300 R020 2000	3.0 X R0.2	2.50	20.00	2.86	15	60	6	20.93	21.65	22.43	23.26	25.13
2NC 300 R020 2500	3.0 X R0.2	2.50	25.00	2.86	15	60	6	26.10	27.00	27.97	29.01	free
2NC 300 R020 3000	3.0 X R0.2	2.50	30.00	2.86	15	70	6	31.27	32.35	33.51	34.76	free
2NC 300 R020 3500	3.0 X R0.2	2.50	35.00	2.86	15	75	6	36.44	37.70	39.05	40.51	free
2NC 300 R030 400	3.0 X R0.3	2.50	4.00	2.86	15	50	6	4.39	4.53	4.69	4.85	5.22
2NC 300 R030 600	3.0 X R0.3	2.50	6.00	2.86	15	50	6	6.46	6.67	6.90	7.15	7.71
2NC 300 R030 800	3.0 X R0.3	2.50	8.00	2.86	15	50	6	8.52	8.81	9.12	9.45	10.19
2NC 300 R030 1000	3.0 X R0.3	2.50	10.00	2.86	15	50	6	10.59	10.95	11.34	11.75	12.68

For Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
2NC 300 R030 1200	3.0 X R0.3	2.50	12.00	2.86	15	50	6	12.66	13.09	13.55	14.05	15.16
2NC 300 R030 1600	3.0 X R0.3	2.50	16.00	2.86	15	60	6	16.79	17.37	17.99	18.65	20.14
2NC 300 R030 2000	3.0 X R0.3	2.50	20.00	2.86	15	60	6	20.93	21.65	22.42	23.25	25.11
2NC 300 R030 2500	3.0 X R0.3	2.50	25.00	2.86	15	60	6	26.10	27.00	27.96	29.00	free
2NC 300 R030 3000	3.0 X R0.3	2.50	30.00	2.86	15	70	6	31.26	32.34	33.50	34.75	free
2NC 300 R030 3500	3.0 X R0.3	2.50	35.00	2.86	15	75	6	36.43	37.69	39.04	40.50	free
2NC 300 R050 400	3.0 X R0.5	2.50	4.00	2.86	15	50	6	4.38	4.52	4.66	4.82	5.17
2NC 300 R050 600	3.0 X R0.5	2.50	6.00	2.86	15	50	6	6.45	6.66	6.88	7.12	7.66
2NC 300 R050 800	3.0 X R0.5	2.50	8.00	2.86	15	50	6	8.52	8.80	9.10	9.42	10.14
2NC 300 R050 1000	3.0 X R0.5	2.50	10.00	2.86	15	50	6	10.58	10.94	11.31	11.72	12.63
2NC 300 R050 1200	3.0 X R0.5	2.50	12.00	2.86	15	50	6	12.65	13.08	13.53	14.02	15.12
2NC 300 R050 1600	3.0 X R0.5	2.50	16.00	2.86	15	60	6	16.79	17.35	17.96	18.62	20.09
2NC 300 R050 2000	3.0 X R0.5	2.50	20.00	2.86	15	60	6	20.92	21.63	22.40	23.22	25.06
2NC 300 R050 2500	3.0 X R0.5	2.50	25.00	2.86	15	60	6	26.09	26.98	27.94	28.97	free
2NC 300 R050 3000	3.0 X R0.5	2.50	30.00	2.86	15	70	6	31.26	32.33	33.48	34.72	free
2NC 300 R050 3500	3.0 X R0.5	2.50	35.00	2.86	15	75	6	36.43	37.68	39.02	40.47	free
2NC 300 R100 800	3.0 X R1.0	2.50	8.00	2.86	15	50	6	8.50	8.76	9.04	9.34	10.02
2NC 300 R100 1000	3.0 X R1.0	2.50	10.00	2.86	15	50	6	10.57	10.90	11.26	11.64	12.51
2NC 300 R100 1200	3.0 X R1.0	2.50	12.00	2.86	15	50	6	12.64	13.04	13.48	13.94	14.99
2NC 300 R100 1600	3.0 X R1.0	2.50	16.00	2.86	15	60	6	16.77	17.32	17.91	18.54	19.97
2NC 300 R100 2000	3.0 X R1.0	2.50	20.00	2.86	15	60	6	20.90	21.60	22.34	23.14	24.94
2NC 300 R100 2500	3.0 X R1.0	2.50	25.00	2.86	15	60	6	26.07	26.95	27.88	28.89	free
2NC 300 R100 3000	3.0 X R1.0	2.50	30.00	2.86	15	70	6	31.24	32.30	33.43	34.64	free
2NC 300 R100 3500	3.0 X R1.0	2.50	35.00	2.86	15	75	6	36.41	37.64	38.97	40.39	free
2NC 400 R010 800	4.0 X R0.1	3.50	8.00	3.80	15	50	6	8.65	8.94	9.26	9.61	10.38
2NC 400 R010 1000	4.0 X R0.1	3.50	10.00	3.80	15	50	6	10.71	11.08	11.48	11.91	12.87
2NC 400 R010 1200	4.0 X R0.1	3.50	12.00	3.80	15	50	6	12.78	13.22	13.70	14.21	15.35
2NC 400 R010 1600	4.0 X R0.1	3.50	16.00	3.80	15	60	6	16.92	17.50	18.13	18.81	free
2NC 400 R010 2000	4.0 X R0.1	3.50	20.00	3.80	15	60	6	21.05	21.78	22.56	23.41	free
2NC 400 R010 2500	4.0 X R0.1	3.50	25.00	3.80	15	60	6	26.22	27.13	28.11	free	free
2NC 400 R010 3000	4.0 X R0.1	3.50	30.00	3.80	15	70	6	31.39	32.48	33.65	free	free
2NC 400 R010 4000	4.0 X R0.1	3.50	40.00	3.80	15	80	6	41.72	43.17	free	free	free
2NC 400 R020 800	4.0 X R0.2	3.50	8.00	3.80	15	50	6	8.64	8.94	9.25	9.59	10.36
2NC 400 R020 1000	4.0 X R0.2	3.50	10.00	3.80	15	50	6	10.71	11.08	11.47	11.89	12.84
2NC 400 R020 1200	4.0 X R0.2	3.50	12.00	3.80	15	50	6	12.78	13.22	13.69	14.19	15.33
2NC 400 R020 1600	4.0 X R0.2	3.50	16.00	3.80	15	60	6	16.91	17.50	18.12	18.79	free
2NC 400 R020 2000	4.0 X R0.2	3.50	20.00	3.80	15	60	6	21.05	21.77	22.55	23.39	free
2NC 400 R020 2500	4.0 X R0.2	3.50	25.00	3.80	15	60	6	26.22	27.12	28.09	free	free
2NC 400 R020 3000	4.0 X R0.2	3.50	30.00	3.80	15	70	6	31.38	32.47	33.64	free	free
2NC 400 R020 4000	4.0 X R0.2	3.50	40.00	3.80	15	80	6	41.72	43.17	free	free	free
2NC 400 R030 800	4.0 X R0.3	3.50	8.00	3.80	15	50	6	8.64	8.93	9.24	9.58	10.33
2NC 400 R030 1000	4.0 X R0.3	3.50	10.00	3.80	15	50	6	10.71	11.07	11.46	11.88	12.82
2NC 400 R030 1200	4.0 X R0.3	3.50	12.00	3.80	15	50	6	12.77	13.21	13.68	14.18	15.30

2날 코너 R 리브
2F Necked Corner Radius

2NC

For Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
2NC 400 R030 1600	4.0 X R0.3	3.50	16.00	3.80	15	60	6	16.91	17.49	18.11	18.78	free
2NC 400 R030 2000	4.0 X R0.3	3.50	20.00	3.80	15	60	6	21.04	21.77	22.54	23.38	free
2NC 400 R030 2500	4.0 X R0.3	3.50	25.00	3.80	15	60	6	26.21	27.12	28.08	free	free
2NC 400 R030 3000	4.0 X R0.3	3.50	30.00	3.80	15	70	6	31.38	32.46	33.63	free	free
2NC 400 R030 4000	4.0 X R0.3	3.50	40.00	3.80	15	80	6	41.72	43.16	free	free	free
2NC 400 R050 800	4.0 X R0.5	3.50	8.00	3.80	15	50	6	8.63	8.92	9.22	9.55	10.28
2NC 400 R050 1000	4.0 X R0.5	3.50	10.00	3.80	15	50	6	10.70	11.06	11.44	11.85	12.77
2NC 400 R050 1200	4.0 X R0.5	3.50	12.00	3.80	15	50	6	12.77	13.20	13.65	14.15	15.26
2NC 400 R050 1600	4.0 X R0.5	3.50	16.00	3.80	15	60	6	16.90	17.47	18.09	18.75	free
2NC 400 R050 2000	4.0 X R0.5	3.50	20.00	3.80	15	60	6	21.04	21.75	22.52	23.35	free
2NC 400 R050 2500	4.0 X R0.5	3.50	25.00	3.80	15	60	6	26.21	27.10	28.06	29.10	free
2NC 400 R050 3000	4.0 X R0.5	3.50	30.00	3.80	15	70	6	31.37	32.45	33.60	free	free
2NC 400 R050 4000	4.0 X R0.5	3.50	40.00	3.80	15	80	6	41.71	43.15	free	free	free
2NC 400 R100 800	4.0 X R1.0	3.50	8.00	3.80	15	50	6	8.62	8.88	9.17	9.47	10.16
2NC 400 R100 1000	4.0 X R1.0	3.50	10.00	3.80	15	50	6	10.68	11.02	11.38	11.77	12.65
2NC 400 R100 1200	4.0 X R1.0	3.50	12.00	3.80	15	50	6	12.75	13.16	13.60	14.07	15.13
2NC 400 R100 1600	4.0 X R1.0	3.50	16.00	3.80	15	60	6	16.89	17.44	18.03	18.67	free
2NC 400 R100 2000	4.0 X R1.0	3.50	20.00	3.80	15	60	6	21.02	21.72	22.47	23.27	free
2NC 400 R100 2500	4.0 X R1.0	3.50	25.00	3.80	15	60	6	26.19	27.07	28.01	29.02	free
2NC 400 R100 3000	4.0 X R1.0	3.50	30.00	3.80	15	70	6	31.36	32.42	33.55	free	free
2NC 400 R100 4000	4.0 X R1.0	3.50	40.00	3.80	15	80	6	41.69	43.11	free	free	free
2NC 500 R010 2000	5.0 X R0.1	4.00	20.00	4.75	15	60	6	21.15	21.88	free	free	free
2NC 500 R010 4000	5.0 X R0.1	4.00	40.00	4.75	15	60	6	41.82	free	free	free	free
2NC 500 R020 2000	5.0 X R0.2	4.00	20.00	4.75	15	60	6	21.14	21.87	free	free	free
2NC 500 R020 4000	5.0 X R0.2	4.00	40.00	4.75	15	80	6	41.82	free	free	free	free
2NC 500 R030 2000	5.0 X R0.3	4.00	20.00	4.75	15	60	6	21.14	21.87	free	free	free
2NC 500 R030 4000	5.0 X R0.3	4.00	40.00	4.75	15	80	6	41.81	free	free	free	free
2NC 500 R050 2000	5.0 X R0.5	4.00	20.00	4.75	15	60	6	21.13	21.85	free	free	free
2NC 500 R050 4000	5.0 X R0.5	4.00	40.00	4.75	15	80	6	41.81	free	free	free	free
2NC 500 R100 2000	5.0 X R1.0	4.00	20.00	4.75	15	60	6	21.12	21.82	free	free	free
2NC 500 R100 4000	5.0 X R1.0	4.00	40.00	4.75	15	80	6	41.79	free	free	free	free
2NC 600 R010 1200	6.0 X R0.1	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R010 1600	6.0 X R0.1	5.00	16.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R010 2000	6.0 X R0.1	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R010 3000	6.0 X R0.1	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R020 1200	6.0 X R0.2	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R020 1600	6.0 X R0.2	5.00	16.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R020 2000	6.0 X R0.2	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R020 3000	6.0 X R0.2	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R030 1200	6.0 X R0.3	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R030 1600	6.0 X R0.3	5.00	16.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R030 2000	6.0 X R0.3	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R030 3000	6.0 X R0.3	5.00	30.00	5.70	-	60	6	free	free	free	free	free

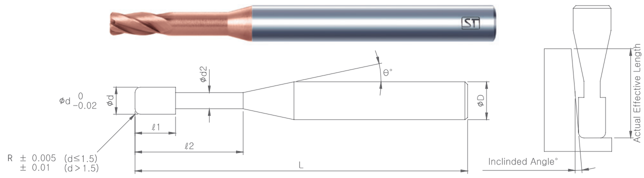
2NC

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
2NC 600 R050 1200	6.0 X R0.5	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R050 1600	6.0 X R0.5	5.00	16.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R050 2000	6.0 X R0.5	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R050 3000	6.0 X R0.5	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R100 1200	6.0 X R1.0	5.00	12.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R100 1600	6.0 X R1.0	5.00	16.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R100 2000	6.0 X R1.0	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R100 3000	6.0 X R1.0	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R150 2000	6.0 X R1.5	5.00	20.00	5.70	-	60	6	free	free	free	free	free
2NC 600 R150 3000	6.0 X R1.5	5.00	30.00	5.70	-	60	6	free	free	free	free	free
2NC 800 R020 2400	8.0 X R0.2	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NC 800 R030 2400	8.0 X R0.3	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NC 800 R050 2400	8.0 X R0.5	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NC 800 R100 2400	8.0 X R1.0	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NC 800 R150 2400	8.0 X R1.5	8.00	24.00	7.60	-	65	8	free	free	free	free	free
2NC 1000 R050 2500	10.0 X R0.5	10.00	25.00	9.50	-	70	10	free	free	free	free	free
2NC 1000 R100 2500	10.0 X R1.0	10.00	25.00	9.50	-	70	10	free	free	free	free	free
2NC 1200 R050 2500	12.0 X R0.5	12.00	25.00	11.50	-	80	12	free	free	free	free	free
2NC 1200 R100 2500	12.0 X R1.0	12.00	25.00	11.50	-	80	12	free	free	free	free	free

4날 코너 R 리브
4F Necked Corner Radius
4NC

4 | HX30° | M/G Carbide | AlTiSiN Coated



Features

- Extended neck style for long reach applications
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징

- 롱 넥 형상으로 깊은 가공에 적합함
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

For Hardened Steels

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30′	1°	1°30′	2°	3°
4NC 100 R005 400	1.0 X R0.05	0.80	4.00	0.95	15	45	4	4.22	4.37	4.53	4.69	5.07
4NC 100 R005 500	1.0 X R0.05	0.80	5.00	0.95	15	45	4	5.26	5.44	5.63	5.84	6.31
4NC 100 R005 600	1.0 X R0.05	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.56
4NC 100 R005 800	1.0 X R0.05	0.80	8.00	0.95	15	45	4	8.36	8.65	8.96	9.29	10.04
4NC 100 R005 1000	1.0 X R0.05	0.80	10.00	0.95	15	45	4	10.43	10.79	11.18	11.59	12.53
4NC 100 R005 1200	1.0 X R0.05	0.80	12.00	0.95	15	45	4	12.49	12.93	13.39	13.89	15.02
4NC 100 R005 1600	1.0 X R0.05	0.80	16.00	0.95	15	45	4	16.63	17.21	17.83	18.49	19.99
4NC 100 R010 400	1.0 X R0.1	0.80	4.00	0.95	15	45	4	4.22	4.37	4.52	4.69	5.06
4NC 100 R010 500	1.0 X R0.1	0.80	5.00	0.95	15	45	4	5.26	5.44	5.63	5.84	6.30
4NC 100 R010 600	1.0 X R0.1	0.80	6.00	0.95	15	45	4	6.29	6.51	6.74	6.99	7.55
4NC 100 R010 800	1.0 X R0.1	0.80	8.00	0.95	15	45	4	8.36	8.65	8.95	9.29	10.03
4NC 100 R010 1000	1.0 X R0.1	0.80	10.00	0.95	15	45	4	10.42	10.78	11.17	11.59	12.52
4NC 100 R010 1200	1.0 X R0.1	0.80	12.00	0.95	15	45	4	12.49	12.92	13.39	13.89	15.00
4NC 100 R010 1600	1.0 X R0.1	0.80	16.00	0.95	15	45	4	16.63	17.20	17.82	18.48	19.98
4NC 100 R020 400	1.0 X R0.2	0.80	4.00	0.95	15	45	4	4.22	4.36	4.51	4.67	5.03
4NC 100 R020 500	1.0 X R0.2	0.80	5.00	0.95	15	45	4	5.25	5.43	5.62	5.82	6.28
4NC 100 R020 600	1.0 X R0.2	0.80	6.00	0.95	15	45	4	6.29	6.50	6.73	6.97	7.52
4NC 100 R020 800	1.0 X R0.2	0.80	8.00	0.95	15	45	4	8.35	8.64	8.94	9.27	10.01
4NC 100 R020 1000	1.0 X R0.2	0.80	10.00	0.95	15	45	4	10.42	10.78	11.16	11.57	12.49
4NC 100 R020 1200	1.0 X R0.2	0.80	12.00	0.95	15	45	4	12.49	12.92	13.38	13.87	14.98
4NC 100 R020 1600	1.0 X R0.2	0.80	16.00	0.95	15	45	4	16.62	17.20	17.81	18.47	19.95
4NC 100 R030 400	1.0 X R0.3	0.80	4.00	0.95	15	45	4	4.22	4.35	4.50	4.66	5.01

4NC

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
4NC 100 R030 500	1.0 X R0.3	0.80	5.00	0.95	15	45	4	5.25	5.42	5.61	5.81	6.25
4NC 100 R030 600	1.0 X R0.3	0.80	6.00	0.95	15	45	4	6.28	6.49	6.72	6.96	7.50
4NC 100 R030 800	1.0 X R0.3	0.80	8.00	0.95	15	45	4	8.35	8.63	8.93	9.26	9.98
4NC 100 R030 1000	1.0 X R0.3	0.80	10.00	0.95	15	45	4	10.42	10.77	11.15	11.56	12.47
4NC 100 R030 1200	1.0 X R0.3	0.80	12.00	0.95	15	45	4	12.49	12.91	13.37	13.86	14.96
4NC 100 R030 1600	1.0 X R0.3	0.80	16.00	0.95	15	45	4	16.62	17.19	17.80	18.46	19.93
4NC 120 R010 400	1.2X R0.1	1.00	4.00	1.14	15	45	4	4.24	4.39	4.54	4.71	5.08
4NC 120 R010 600	1.2 X R0.1	1.00	6.00	1.14	15	45	4	6.31	6.53	6.76	7.01	7.57
4NC 120 R010 800	1.2 X R0.1	1.00	8.00	1.14	15	45	4	8.38	8.67	8.97	9.31	10.06
4NC 120 R010 1200	1.2 X R0.1	1.00	12.00	1.14	15	45	4	12.51	12.94	13.41	13.91	15.03
4NC 120 R020 400	1.2X R0.2	1.00	4.00	1.14	15	45	4	4.24	4.38	4.53	4.69	5.06
4NC 120 R020 600	1.2 X R0.2	1.00	6.00	1.14	15	45	4	6.31	6.52	6.75	6.99	7.54
4NC 120 R020 800	1.2 X R0.2	1.00	8.00	1.14	15	45	4	8.37	8.66	8.96	9.29	10.03
4NC 120 R020 1200	1.2 X R0.2	1.00	12.00	1.14	15	45	4	12.51	12.94	13.40	13.89	15.00
4NC 120 R030 400	1.2X R0.3	1.00	4.00	1.14	15	45	4	4.24	4.37	4.52	4.68	5.03
4NC 120 R030 600	1.2 X R0.3	1.00	6.00	1.14	15	45	4	6.30	6.51	6.74	6.98	7.52
4NC 120 R030 800	1.2 X R0.3	1.00	8.00	1.14	15	45	4	8.37	8.65	8.95	9.28	10.01
4NC 120 R030 1200	1.2 X R0.3	1.00	12.00	1.14	15	45	4	12.50	12.93	13.39	13.88	14.98
4NC 150 R010 600	1.5 X R0.1	1.35	6.00	1.44	15	45	4	6.31	6.53	6.76	7.01	7.57
4NC 150 R010 800	1.5 X R0.1	1.35	8.00	1.44	15	45	4	8.38	8.67	8.97	9.31	10.06
4NC 150 R010 1200	1.5 X R0.1	1.35	12.00	1.44	15	45	4	12.51	12.94	13.41	13.91	15.03
4NC 150 R010 1600	1.5 X R0.1	1.35	16.00	1.44	15	45	4	16.65	17.22	17.84	18.51	20.00
4NC 150 R010 2000	1.5 X R0.1	1.35	20.00	1.44	15	50	4	20.78	21.50	22.27	23.11	free
4NC 150 R020 600	1.5 X R0.2	1.35	6.00	1.44	15	45	4	6.31	6.52	6.75	6.99	7.54
4NC 150 R020 800	1.5 X R0.2	1.35	8.00	1.44	15	45	4	8.37	8.66	8.96	9.29	10.03
4NC 150 R020 1200	1.5 X R0.2	1.35	12.00	1.44	15	45	4	12.51	12.94	13.40	13.89	15.00
4NC 150 R020 1600	1.5 X R0.2	1.35	16.00	1.44	15	45	4	16.64	17.22	17.83	18.49	19.98
4NC 150 R020 2000	1.5 X R0.2	1.35	20.00	1.44	15	50	4	20.78	21.49	22.26	23.09	free
4NC 150 R030 600	1.5 X R0.3	1.35	6.00	1.44	15	45	4	6.30	6.51	6.74	6.98	7.52
4NC 150 R030 800	1.5 X R0.3	1.35	8.00	1.44	15	45	4	8.37	8.65	8.95	9.28	10.01
4NC 150 R030 1200	1.5 X R0.3	1.35	12.00	1.44	15	45	4	12.50	12.93	13.39	13.88	14.98
4NC 150 R030 1600	1.5 X R0.3	1.35	16.00	1.44	15	45	4	16.64	17.21	17.82	18.48	19.95
4NC 150 R030 2000	1.5 X R0.3	1.35	20.00	1.44	15	50	4	20.77	21.49	22.25	23.08	free
4NC 150 R050 600	1.5 X R0.5	1.35	6.00	1.44	15	45	4	6.30	6.50	6.71	6.95	7.47
4NC 150 R050 800	1.5 X R0.5	1.35	8.00	1.44	15	45	4	8.36	8.64	8.93	9.25	9.96
4NC 150 R050 1200	1.5 X R0.5	1.35	12.00	1.44	15	45	4	12.50	12.92	13.36	13.85	14.93
4NC 150 R050 1600	1.5 X R0.5	1.35	16.00	1.44	15	45	4	16.63	17.19	17.80	18.45	19.90
4NC 150 R050 2000	1.5 X R0.5	1.35	20.00	1.44	15	50	4	20.77	21.47	22.23	23.05	free
4NC 200 R010 600	2.0 X R0.1	1.70	6.00	1.92	15	45	4	6.35	6.57	6.80	7.05	7.62
4NC 200 R010 800	2.0 X R0.1	1.70	8.00	1.92	15	45	4	8.42	8.71	9.02	9.35	10.10
4NC 200 R010 1000	2.0 X R0.1	1.70	10.00	1.92	15	45	4	10.48	10.84	11.23	11.65	12.59
4NC 200 R010 1200	2.0 X R0.1	1.70	12.00	1.92	15	45	4	12.55	12.98	13.45	13.95	15.07
4NC 200 R010 1600	2.0 X R0.1	1.70	16.00	1.92	15	50	4	16.68	17.26	17.88	18.55	free

4날 코너 R 리브
4F Necked Corner Radius

4NC

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
4NC 200 R010 2000	2.0 X R0.1	1.70	20.00	1.92	15	50	4	20.82	21.54	22.32	23.15	free
4NC 200 R010 2500	2.0 X R0.1	1.70	25.00	1.92	15	60	4	25.99	26.89	27.86	free	free
4NC 200 R020 600	2.0 X R0.2	1.70	6.00	1.92	15	45	4	6.34	6.56	6.79	7.04	7.59
4NC 200 R020 800	2.0 X R0.2	1.70	8.00	1.92	15	45	4	8.41	8.70	9.01	9.34	10.08
4NC 200 R020 1000	2.0 X R0.2	1.70	10.00	1.92	15	45	4	10.48	10.84	11.22	11.64	12.56
4NC 200 R020 1200	2.0 X R0.2	1.70	12.00	1.92	15	45	4	12.55	12.98	13.44	13.93	15.05
4NC 200 R020 1600	2.0 X R0.2	1.70	16.00	1.92	15	50	4	16.68	17.26	17.87	18.53	free
4NC 200 R020 2000	2.0 X R0.2	1.70	20.00	1.92	15	50	4	20.82	21.53	22.31	23.13	free
4NC 200 R020 2500	2.0 X R0.2	1.70	25.00	1.92	15	60	4	25.98	26.88	27.85	28.88	free
4NC 200 R030 600	2.0 X R0.3	1.70	6.00	1.92	15	45	4	6.34	6.55	6.78	7.02	7.57
4NC 200 R030 800	2.0 X R0.3	1.70	8.00	1.92	15	45	4	8.41	8.69	8.99	9.32	10.05
4NC 200 R030 1000	2.0 X R0.3	1.70	10.00	1.92	15	45	4	10.48	10.83	11.21	11.62	12.54
4NC 200 R030 1200	2.0 X R0.3	1.70	12.00	1.92	15	45	4	12.54	12.97	13.43	13.92	15.03
4NC 200 R030 1600	2.0 X R0.3	1.70	16.00	1.92	15	50	4	16.68	17.25	17.86	18.52	free
4NC 200 R030 2000	2.0 X R0.3	1.70	20.00	1.92	15	50	4	20.81	21.53	22.29	23.12	free
4NC 200 R030 2500	2.0 X R0.3	1.70	25.00	1.92	15	60	4	25.98	26.88	27.84	28.87	free
4NC 200 R050 600	2.0 X R0.5	1.70	6.00	1.92	15	45	4	6.33	6.54	6.76	6.99	7.52
4NC 200 R050 800	2.0 X R0.5	1.70	8.00	1.92	15	45	4	8.40	8.68	8.97	9.29	10.00
4NC 200 R050 1000	2.0 X R0.5	1.70	10.00	1.92	15	45	4	10.47	10.82	11.19	11.59	12.49
4NC 200 R050 1200	2.0 X R0.5	1.70	12.00	1.92	15	45	4	12.54	12.96	13.41	13.89	14.98
4NC 200 R050 1600	2.0 X R0.5	1.70	16.00	1.92	15	50	4	16.67	17.23	17.84	18.49	free
4NC 200 R050 2000	2.0 X R0.5	1.70	20.00	1.92	15	50	4	20.81	21.51	22.27	23.09	free
4NC 200 R050 2500	2.0 X R0.5	1.70	25.00	1.92	15	60	4	25.97	26.86	27.81	28.84	free
4NC 250 R010 1000	2.5 X R0.1	2.00	10.00	2.39	15	45	4	10.54	10.90	11.29	11.71	12.66
4NC 250 R010 1600	2.5 X R0.1	2.00	16.00	2.39	15	50	4	16.74	17.32	17.94	18.61	free
4NC 250 R010 2500	2.5 X R0.1	2.00	25.00	2.39	15	60	4	26.05	26.95	27.92	free	free
4NC 250 R020 1000	2.5 X R0.2	2.00	10.00	2.39	15	45	4	10.54	10.90	11.28	11.70	12.63
4NC 250 R020 1600	2.5 X R0.2	2.00	16.00	2.39	15	50	4	16.74	17.32	17.93	18.60	free
4NC 250 R020 2500	2.5 X R0.2	2.00	25.00	2.39	15	60	4	26.04	26.94	27.91	free	free
4NC 250 R030 1000	2.5 X R0.3	2.00	10.00	2.39	15	45	4	10.53	10.89	11.27	11.68	12.61
4NC 250 R030 1600	2.5 X R0.3	2.00	16.00	2.39	15	50	4	16.74	17.31	17.92	18.58	free
4NC 250 R030 2500	2.5 X R0.3	2.00	25.00	2.39	15	60	4	26.04	26.94	27.90	free	free
4NC 250 R050 1000	2.5 X R0.5	2.00	10.00	2.39	15	45	4	10.53	10.88	11.25	11.65	12.56
4NC 250 R050 1600	2.5 X R0.5	2.00	16.00	2.39	15	50	4	16.73	17.29	17.90	18.55	free
4NC 250 R050 2500	2.5 X R0.5	2.00	25.00	2.39	15	60	4	26.03	26.92	27.88	free	free
4NC 300 R010 1000	3.0 X R0.1	2.50	10.00	2.86	15	50	6	10.60	10.96	11.36	11.78	12.73
4NC 300 R010 1200	3.0 X R0.1	2.50	12.00	2.86	15	50	6	12.67	13.10	13.57	14.08	15.21
4NC 300 R010 1600	3.0 X R0.1	2.50	16.00	2.86	15	60	6	16.80	17.38	18.01	18.68	20.19
4NC 300 R010 2000	3.0 X R0.1	2.50	20.00	2.86	15	60	6	20.93	21.66	22.44	23.28	25.16
4NC 300 R010 2500	3.0 X R0.1	2.50	25.00	2.86	15	60	6	26.10	27.01	27.98	29.03	free
4NC 300 R010 3000	3.0 X R0.1	2.50	30.00	2.86	15	70	6	31.27	32.36	33.52	34.78	free
4NC 300 R010 3500	3.0 X R0.1	2.50	35.00	2.86	15	70	6	36.44	37.71	39.06	40.53	free
4NC 300 R020 1000	3.0 X R0.2	2.50	10.00	2.86	15	50	6	10.59	10.96	11.35	11.76	12.70

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle Θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece 30´	1°	1°30´	2°	3°
4NC 300 R020 1200	3.0 X R0.2	2.50	12.00	2.86	15	50	6	12.66	13.10	13.56	14.06	15.19
4NC 300 R020 1600	3.0 X R0.2	2.50	16.00	2.86	15	60	6	16.80	17.38	18.00	18.66	20.16
4NC 300 R020 2000	3.0 X R0.2	2.50	20.00	2.86	15	60	6	20.93	21.65	22.43	23.26	25.13
4NC 300 R020 2500	3.0 X R0.2	2.50	25.00	2.86	15	60	6	26.10	27.00	27.97	29.01	free
4NC 300 R020 3000	3.0 X R0.2	2.50	30.00	2.86	15	70	6	31.27	32.35	33.51	34.76	free
4NC 300 R020 3500	3.0 X R0.2	2.50	35.00	2.86	15	70	6	36.44	37.70	39.05	40.51	free
4NC 300 R030 1000	3.0 X R0.3	2.50	10.00	2.86	15	50	6	10.59	10.95	11.34	11.75	12.68
4NC 300 R030 1200	3.0 X R0.3	2.50	12.00	2.86	15	50	6	12.66	13.09	13.55	14.05	15.16
4NC 300 R030 1600	3.0 X R0.3	2.50	16.00	2.86	15	60	6	16.79	17.37	17.99	18.65	20.14
4NC 300 R030 2000	3.0 X R0.3	2.50	20.00	2.86	15	60	6	20.93	21.65	22.42	23.25	25.11
4NC 300 R030 2500	3.0 X R0.3	2.50	25.00	2.86	15	60	6	26.10	27.00	27.96	29.00	free
4NC 300 R030 3000	3.0 X R0.3	2.50	30.00	2.86	15	70	6	31.26	32.34	33.50	34.75	free
4NC 300 R030 3500	3.0 X R0.3	2.50	35.00	2.86	15	70	6	36.43	37.69	39.04	40.50	free
4NC 300 R050 1000	3.0 X R0.5	2.50	10.00	2.86	15	50	6	10.58	10.94	11.31	11.72	12.63
4NC 300 R050 1200	3.0 X R0.5	2.50	12.00	2.86	15	50	6	12.65	13.08	13.53	14.02	15.12
4NC 300 R050 1600	3.0 X R0.5	2.50	16.00	2.86	15	60	6	16.79	17.35	17.96	18.62	20.09
4NC 300 R050 2000	3.0 X R0.5	2.50	20.00	2.86	15	60	6	20.92	21.63	22.40	23.22	25.06
4NC 300 R050 2500	3.0 X R0.5	2.50	25.00	2.86	15	60	6	26.09	26.98	27.94	28.97	free
4NC 300 R050 3000	3.0 X R0.5	2.50	30.00	2.86	15	70	6	31.26	32.33	33.48	34.72	free
4NC 300 R050 3500	3.0 X R0.5	2.50	35.00	2.86	15	70	6	36.43	37.68	39.02	40.47	free
4NC 300 R100 1000	3.0 X R1.0	2.50	10.00	2.86	15	50	6	10.57	10.90	11.26	11.64	12.51
4NC 300 R100 1200	3.0 X R1.0	2.50	12.00	2.86	15	50	6	12.64	13.04	13.48	13.94	14.99
4NC 300 R100 1600	3.0 X R1.0	2.50	16.00	2.86	15	60	6	16.77	17.32	17.91	18.54	19.97
4NC 300 R100 2000	3.0 X R1.0	2.50	20.00	2.86	15	60	6	20.90	21.60	22.34	23.14	24.94
4NC 300 R100 2500	3.0 X R1.0	2.50	25.00	2.86	15	60	6	26.07	26.95	27.88	28.89	free
4NC 300 R100 3000	3.0 X R1.0	2.50	30.00	2.86	15	70	6	31.24	32.30	33.43	34.64	free
4NC 300 R100 3500	3.0 X R1.0	2.50	35.00	2.86	15	70	6	36.41	37.64	38.97	40.39	free
4NC 400 R010 1200	4.0 X R0.1	4.00	12.00	3.80	15	50	6	12.78	13.22	13.70	14.21	15.35
4NC 400 R010 1600	4.0 X R0.1	4.00	16.00	3.80	15	60	6	16.92	17.50	18.13	18.81	free
4NC 400 R010 2000	4.0 X R0.1	4.00	20.00	3.80	15	60	6	21.05	21.78	22.56	23.41	free
4NC 400 R010 2500	4.0 X R0.1	4.00	25.00	3.80	15	60	6	26.22	27.13	28.11	free	free
4NC 400 R010 3000	4.0 X R0.1	4.00	30.00	3.80	15	60	6	31.39	32.48	33.65	free	free
4NC 400 R010 3500	4.0 X R0.1	4.00	35.00	3.80	15	70	6	36.56	37.83	free	free	free
4NC 400 R010 4000	4.0 X R0.1	4.00	40.00	3.80	15	80	6	41.72	43.17	free	free	free
4NC 400 R020 1200	4.0 X R0.2	4.00	12.00	3.80	15	50	6	12.78	13.22	13.69	14.19	15.33
4NC 400 R020 1600	4.0 X R0.2	4.00	16.00	3.80	15	60	6	16.91	17.50	18.12	18.79	free
4NC 400 R020 2000	4.0 X R0.2	4.00	20.00	3.80	15	60	6	21.05	21.77	22.55	23.39	free
4NC 400 R020 2500	4.0 X R0.2	4.00	25.00	3.80	15	60	6	26.22	27.12	28.09	free	free
4NC 400 R020 3000	4.0 X R0.2	4.00	30.00	3.80	15	60	6	31.38	32.47	33.64	free	free
4NC 400 R020 3500	4.0 X R0.2	4.00	35.00	3.80	15	70	6	36.55	37.82	free	free	free
4NC 400 R020 4000	4.0 X R0.2	4.00	40.00	3.80	15	80	6	41.72	43.17	free	free	free
4NC 400 R030 1200	4.0 X R0.3	4.00	12.00	3.80	15	50	6	12.77	13.21	13.68	14.18	15.30
4NC 400 R030 1600	4.0 X R0.3	4.00	16.00	3.80	15	60	6	16.91	17.49	18.11	18.78	free

4날 코너 R 리브

4F Necked Corner Radius

4NC

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	섕크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30′	1°	1°30′	2°	3°
4NC 400 R030 2000	4.0 X R0.3	4.00	20.00	3.80	15	60	6	21.04	21.77	22.54	23.38	free
4NC 400 R030 2500	4.0 X R0.3	4.00	25.00	3.80	15	60	6	26.21	27.12	28.08	free	free
4NC 400 R030 3000	4.0 X R0.3	4.00	30.00	3.80	15	60	6	31.38	32.46	33.63	free	free
4NC 400 R030 3500	4.0 X R0.3	4.00	35.00	3.80	15	70	6	36.55	37.81	free	free	free
4NC 400 R030 4000	4.0 X R0.3	4.00	40.00	3.80	15	80	6	41.72	43.16	free	free	free
4NC 400 R050 1200	4.0 X R0.5	4.00	12.00	3.80	12	50	6	12.77	13.20	13.65	14.15	15.26
4NC 400 R050 1600	4.0 X R0.5	4.00	16.00	3.80	16	60	6	16.90	17.47	18.09	18.75	free
4NC 400 R050 2000	4.0 X R0.5	4.00	20.00	3.80	20	60	6	21.04	21.75	22.52	23.35	free
4NC 400 R050 2500	4.0 X R0.5	4.00	25.00	3.80	25	60	6	26.21	27.10	28.06	29.10	free
4NC 400 R050 3000	4.0 X R0.5	4.00	30.00	3.80	15	60	6	31.37	32.45	33.60	free	free
4NC 400 R050 3500	4.0 X R0.5	4.00	35.00	3.80	15	70	6	36.54	37.80	free	free	free
4NC 400 R050 4000	4.0 X R0.5	4.00	40.00	3.80	15	80	6	41.71	43.15	free	free	free
4NC 400 R100 1200	4.0 X R1.0	4.00	12.00	3.80	15	50	6	12.75	13.16	13.60	14.07	15.13
4NC 400 R100 1600	4.0 X R1.0	4.00	16.00	3.80	15	60	6	16.89	17.44	18.03	18.67	free
4NC 400 R100 2000	4.0 X R1.0	4.00	20.00	3.80	15	60	6	21.02	21.72	22.47	23.27	free
4NC 400 R100 2500	4.0 X R1.0	4.00	25.00	3.80	15	60	6	26.19	27.07	28.01	29.02	free
4NC 400 R100 3000	4.0 X R1.0	4.00	30.00	3.80	15	60	6	31.36	32.42	33.55	free	free
4NC 400 R100 3500	4.0 X R1.0	4.00	35.00	3.80	15	70	6	36.53	37.76	39.09	free	free
4NC 400 R100 4000	4.0 X R1.0	4.00	40.00	3.80	15	80	6	41.69	43.11	free	free	free
4NC 500 R010 2000	5.0 X R0.1	5.00	20.00	4.75	15	60	6	21.15	21.88	free	free	free
4NC 500 R010 4000	5.0 X R0.1	5.00	40.00	4.75	15	80	6	41.82	free	free	free	free
4NC 500 R020 2000	5.0 X R0.2	5.00	20.00	4.75	15	60	6	21.14	21.87	free	free	free
4NC 500 R020 4000	5.0 X R0.2	5.00	40.00	4.75	15	80	6	41.82	free	free	free	free
4NC 500 R030 2000	5.0 X R0.3	5.00	20.00	4.75	15	60	6	21.14	21.87	free	free	free
4NC 500 R030 4000	5.0 X R0.3	5.00	40.00	4.75	15	80	6	41.81	free	free	free	free
4NC 500 R050 2000	5.0 X R0.5	5.00	20.00	4.75	15	60	6	21.13	21.85	free	free	free
4NC 500 R050 4000	5.0 X R0.5	5.00	40.00	4.75	15	80	6	41.81	free	free	free	free
4NC 500 R100 2000	5.0 X R1.0	5.00	20.00	4.75	15	60	6	21.12	21.82	free	free	free
4NC 500 R100 4000	5.0 X R1.0	5.00	40.00	4.75	15	80	6	41.79	free	free	free	free
4NC 600 R010 2000	6.0 X R0.1	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NC 600 R010 4000	6.0 X R0.1	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NC 600 R020 2000	6.0 X R0.2	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NC 600 R020 4000	6.0 X R0.2	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NC 600 R030 2000	6.0 X R0.3	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NC 600 R030 4000	6.0 X R0.3	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NC 600 R050 2000	6.0 X R0.5	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NC 600 R050 4000	6.0 X R0.5	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NC 600 R100 2000	6.0 X R1.0	6.00	20.00	5.70	-	60	6	free	free	free	free	free
4NC 600 R100 4000	6.0 X R1.0	6.00	40.00	5.70	-	80	6	free	free	free	free	free
4NC 800 R030 2500	8.0 X R0.3	9.00	25.00	7.60	-	65	8	free	free	free	free	free
4NC 800 R050 2500	8.0 X R0.5	9.00	25.00	7.60	-	65	8	free	free	free	free	free
4NC 800 R100 2500	8.0 X R1.0	9.00	25.00	7.60	-	65	8	free	free	free	free	free
4NC 800 R150 2500	8.0 X R1.5	9.00	25.00	7.60	-	65	8	free	free	free	free	free

(Unit: mm)

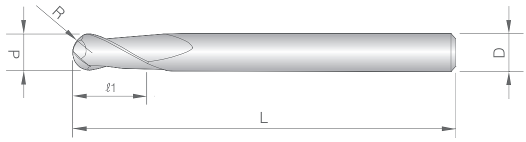
제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	목경 Neck Dia d2	구배각 Taper Angle θ°	전장 Overall Length L	생크경 Shank Dia. D	제작물 구배각에 따른 유효 길이 Actual Effective Length depending on inclined angle of workpiece				
								30´	1°	1°30´	2°	3°
4NC 1000 R050 2500	10.0 X R0.5	11.00	25.00	9.50	-	70	10	free	free	free	free	free
4NC 1000 R100 2500	10.0 X R1.0	11.00	25.00	9.50	-	70	10	free	free	free	free	free
4NC 1000 R150 2500	10.0 X R1.5	11.00	25.00	9.50	-	70	10	free	free	free	free	free
4NC 1000 R200 2500	10.0 X R2.0	11.00	25.00	9.50	-	70	10	free	free	free	free	free
4NC 1200 R050 3000	12.0 X R0.5	12.00	30.00	11.50	-	80	12	free	free	free	free	free
4NC 1200 R100 3000	12.0 X R1.0	12.00	30.00	11.50	-	80	12	free	free	free	free	free
4NC 1200 R150 3000	12.0 X R1.5	12.00	30.00	11.50	-	80	12	free	free	free	free	free
4NC 1200 R200 3000	12.0 X R2.0	12.00	30.00	11.50	-	80	12	free	free	free	free	free

2날 볼 표준

2F Ball End-Regular

2BR

2 | HX30° | M/G Carbide | AlTiSiN Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BR 020 040 S4	0.2 X R0.1	0.4	45	4	
2BR 030 060 S4	0.3 X R0.15	0.6	45	4	
2BR 040 080 S4	0.4 X R0.2	0.8	45	4	
2BR 050 100 S4	0.5 X R0.25	1	45	4	
2BR 060 120 S4	0.6 X R0.3	1.2	45	4	
2BR 070 150 S4	0.7 X R0.35	1.5	45	4	
2BR 080 200 S4	0.8 X R0.4	2	45	4	
2BR 100 250 S4	1.0 X R0.5	2.5	45	4	
2BR 100 250 S6	1.0 X R0.5	2.5	50	6	
2BR 120 300 S4	1.2 X R0.6	3	45	4	
2BR 150 300 S4	1.5 X R0.75	3	45	4	
2BR 150 300 S6	1.5 X R0.75	3	50	6	
2BR 200 500 S4	2.0 X R1.0	5	45	4	
2BR 200 500 S6	2.0 X R1.0	5	50	6	
2BR 250 600 S4	2.5 X R1.25	6	45	4	
2BR 250 600 S6	2.5 X R1.25	6	50	6	
2BR 300 800 S4	3.0 X R1.5	8	50	4	
2BR 300 800 S6	3.0 X R1.5	8	60	6	
2BR 350 800 S4	3.5 X R1.75	8	50	4	
2BR 400 800 S4	4.0 X R2.0	8	60	4	
2BR 400 800 S6	4.0 X R2.0	8	60	6	
2BR 500 1000 S6	5.0 X R2.5	10	70	6	
2BR 600 1200 60	6.0 X R3.0	12	60	6	
2BR 600 1200 70	6.0 X R3.0	12	70	6	

2날 볼 표준
2F Ball End-Regular

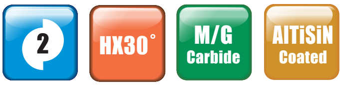
2BR

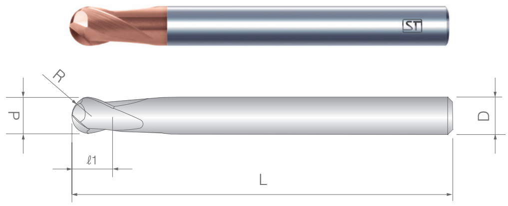
For Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BR 600 1200 80	6.0 X R3.0	12	80	6	
2BR 600 1200 90	6.0 X R3.0	12	90	6	
2BR 600 1200 100	6.0 X R3.0	12	100	6	
2BR 700 1400 80	7.0 X R3.5	14	80	8	
2BR 800 1400 60	8.0 X R4.0	14	60	8	
2BR 800 1400 90	8.0 X R4.0	14	90	8	
2BR 800 1400 100	8.0 X R4.0	14	100	8	
2BR 800 1400 110	8.0 X R4.0	14	110	8	
2BR 900 1600 100	9.0 X R4.5	16	100	10	
2BR 1000 1800 70	10.0 X R5.0	18	70	10	
2BR 1000 1800 90	10.0 X R5.0	18	90	10	
2BR 1000 1800 100	10.0 X R5.0	18	100	10	
2BR 1200 2200 75	12.0 X R6.0	22	75	12	
2BR 1200 2200 100	12.0 X R6.0	22	100	12	
2BR 1200 2200 110	12.0 X R6.0	22	110	12	
2BR 1200 2200 130	12.0 X R6.0	22	130	12	
2BR 1400 2400 110	14.0 X R7.0	24	110	14	
2BR 1600 3000 110	16.0 X R8.0	30	110	16	
2BR 1600 3000 160	16.0 X R8.0	30	160	16	
2BR 2000 3800 160	20.0 X R10.0	38	160	20	

2날 볼 쇼트
2F Ball End-Short
2BS





Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality
- Suitable for heat shrink fit chucks

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함
- 열박음척에 사용하는데 적합함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

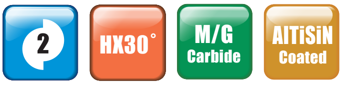
탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

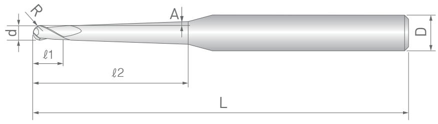
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BS 050 050 S4	0.5 X R0.25	0.5	45	4	
2BS 100 100 S4	1.0 X R0.5	1	45	4	
2BS 150 150 S4	1.5 X R0.75	1.5	45	4	
2BS 200 200 S4	2.0 X R1.0	2	45	4	
2BS 300 300 S4	3.0 X R1.5	3	45	4	
2BS 400 400 S4	4.0 X R2.0	4	45	4	
2BS 600 600 S6	6.0 X R3.0	6	50	6	
2BS 800 1000 S8	8.0 X R4.0	10	60	8	
2BS 1000 1000 S10	10.0 X R5.0	10	70	10	
2BS 1200 1200 S12	12.0 X R6.0	12	75	12	

2날 볼 – 테이퍼 넥
2F Ball End-Tapered Neck

2BT





Features

- Tapered neck for vibration-reduced cutting
- Extended neck style for long reach applications
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life

특징

- 넥 부분이 테이퍼로 되어 진동이 감소되고 절삭면의 조도가 향상됨
- 롱 넥 형상으로 깊은 가공에 적합함
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

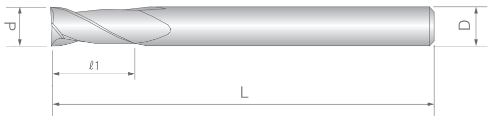
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	각도 Angle A (°)	유효장 Length of Reach l2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BT 200 2500	2.0 X R1.0	3.5	0.7	25	70	6	
2BT 200 3700	2.0 X R1.0	3.5	0.75	37	70	6	
2BT 250 2500	2.5 X R1.25	3.5	0.7	25	70	6	
2BT 250 3700	2.5 X R1.25	3.5	0.75	37	70	6	
2BT 300 2500	3.0 X R1.5	4.5	0.7	25	70	6	
2BT 300 3700	3.0 X R1.5	4.5	0.75	37	70	6	
2BT 300 3000	3.0 X R1.5	5	1.5	30	70	6	
2BT 300 4000	3.0 X R1.5	5	1.5	40	80	6	
2BT 400 4500	4.0 X R2.0	6	1.5	45	90	6	

2날 평 표준
2F Square End-Regular

2SR

2 HX30° M/G Carbide AlTiSiN Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SR 020 030 S4	0.2	0.3	45	4	
2SR 030 050 S4	0.3	0.5	45	4	
2SR 040 080 S4	0.4	0.8	45	4	
2SR 050 100 S4	0.5	1	45	4	
2SR 060 120 S4	0.6	1.2	45	4	
2SR 070 140 S4	0.7	1.4	45	4	
2SR 080 160 S4	0.8	1.6	45	4	
2SR 100 250 S4	1	2.5	45	4	
2SR 100 250 S6	1	2.5	45	6	
2SR 120 300 S4	1.2	3	45	4	
2SR 150 400 S4	1.5	4	45	4	
2SR 150 400 S6	1.5	4	45	6	
2SR 200 600 S4	2	6	45	4	
2SR 200 600 S6	2	6	45	6	
2SR 250 800 S4	2.5	8	45	4	
2SR 250 800 S6	2.5	8	45	6	
2SR 300 800 S4	3	8	45	4	
2SR 300 800 S6	3	8	45	6	
2SR 350 800 S4	3.5	8	45	4	
2SR 400 1000 S4	4	10	45	4	
2SR 400 1000 S6	4	10	45	6	
2SR 450 1000 S6	4.5	10	45	6	
2SR 500 1300 S6	5	13	50	6	
2SR 550 1300 S6	5.5	13	50	6	

2날 평 표준

2F Square End-Regular

2SR

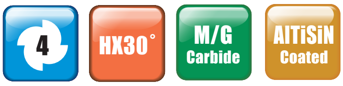
For Hardened Steels

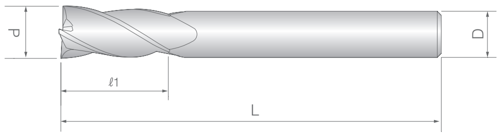
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SR 600 1500 S6	6	15	50	6	
2SR 650 1500 S8	6.5	15	60	8	
2SR 700 1600 S8	7	16	60	8	
2SR 750 1600 S8	7.5	16	60	8	
2SR 800 1900 S8	8	19	60	8	
2SR 850 1900 S10	8.5	19	70	10	
2SR 900 1900 S10	9	19	70	10	
2SR 950 1900 S10	9.5	19	70	10	
2SR 1000 2200 S10	10	22	70	10	
2SR 1050 2200 S12	10.5	22	75	12	
2SR 1100 2200 S12	11	22	75	12	
2SR 1200 2600 S12	12	26	75	12	
2SR 1400 2600 S14	14	26	80	14	
2SR 1600 3500 S16	16	35	100	16	
2SR 2000 4000 S20	20	40	100	20	

4날 평 표준
4F Square End-Regular

4SR





Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4SR 100 250 S4	1	2.5	45	4	
4SR 100 250 S6	1	2.5	45	6	
4SR 150 400 S4	1.5	4	45	4	
4SR 150 400 S6	1.5	4	45	6	
4SR 200 600 S4	2	6	45	4	
4SR 200 600 S6	2	6	45	6	
4SR 250 800 S4	2.5	8	45	4	
4SR 250 800 S6	2.5	8	45	6	
4SR 300 800 S4	3	8	45	4	
4SR 300 800 S6	3	8	45	6	
4SR 350 800 S4	3.5	8	45	4	
4SR 400 1000 S4	4	10	45	4	
4SR 400 1000 S6	4	10	45	6	
4SR 450 1000 S6	4.5	10	45	6	
4SR 500 1300 S6	5	13	50	6	
4SR 550 1300 S6	5.5	13	50	6	
4SR 600 1500 S6	6	15	50	6	
4SR 650 1500 S8	6.5	15	50	8	
4SR 700 1600 S8	7	16	60	8	
4SR 750 1600 S8	7.5	16	60	8	
4SR 800 1900 S8	8	19	60	8	
4SR 850 1900 S10	8.5	19	70	10	
4SR 900 1900 S10	9	19	70	10	
4SR 1000 2200 S10	10	22	70	10	

4날 평 표준
4F Square End-Regular

4SR

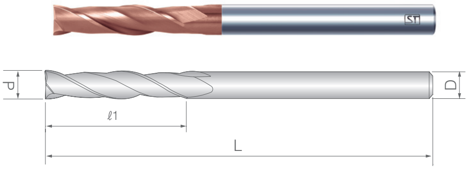
For Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4SR 1050 2200 S12	10.5	22	75	12	
4SR 1200 2600 S12	12	26	75	12	
4SR 1400 2600 S14	14	26	80	14	
4SR 1600 3500 S16	16	35	100	16	
4SR 2000 4000 S20	20	40	100	20	

2날 평 롱
2F Square End-Long
2SL

2 | HX30° | M/G Carbide | AlTiSiN Coated



Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

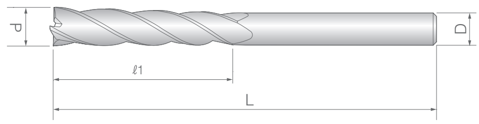
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SL 100 500 60	1	5	60	6	
2SL 150 1000 60	1.5	10	60	6	
2SL 200 1000 60	2	10	60	6	
2SL 300 1500 70	3	15	70	6	
2SL 400 2000 70	4	20	70	6	
2SL 500 2000 70	5	20	70	6	
2SL 600 2000 70	6	20	70	6	
2SL 600 2500 75	6	25	75	6	
2SL 600 3000 80	6	30	80	6	
2SL 800 2500 75	8	25	75	8	
2SL 800 3000 80	8	30	80	8	
2SL 800 4000 90	8	40	90	8	
2SL 1000 3000 80	10	30	80	10	
2SL 1000 3500 80	10	35	80	10	
2SL 1000 4000 90	10	40	90	10	
2SL 1000 5000 100	10	50	100	10	
2SL 1200 3000 80	12	30	80	12	
2SL 1200 4000 100	12	40	100	12	
2SL 1200 5000 110	12	50	110	12	
2SL 1600 8000 150	16	80	150	16	
2SL 2000 8000 160	20	80	160	20	

4날 평 롱
4F Square End-Long

4SL

4 | HX30° | M/G Carbide | AlTiSiN Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4SL 200 1000 60	2	10	60	6	
4SL 300 1500 70	3	15	70	6	
4SL 300 2000 70	3	20	70	6	
4SL 400 1500 70	4	15	70	6	
4SL 400 2000 70	4	20	70	6	
4SL 500 2500 70	5	25	70	6	
4SL 600 2000 70	6	20	70	6	
4SL 600 3000 80	6	30	80	6	
4SL 800 3000 80	8	30	80	8	
4SL 800 3500 90	8	35	90	8	
4SL 800 4000 90	8	40	90	8	
4SL 1000 3500 90	10	35	90	10	
4SL 1000 4000 90	10	40	90	10	
4SL 1000 5000 100	10	50	100	10	
4SL 1000 6000 110	10	60	110	10	
4SL 1200 3000 90	12	30	90	12	
4SL 1200 4000 100	12	40	100	12	
4SL 1200 6000 110	12	60	110	12	
4SL 1600 5500 110	16	55	110	16	
4SL 2000 8000 160	20	80	160	20	

2날 코너 R 롱
2F Corner Radius-Long

2CL

2 | HX30° | M/G Carbide | AlTiSiN Coated

Features
- Used micrograin solid carbide excellent for high speed cutting:
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 코너R Cutting Dia. X Corner R (d x CR)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2CL 080 R020 45	0.8 X R0.2	1.6	45	4	
2CL 100 R010 45	1.0 X R0.1	2.5	45	4	
2CL 100 R020 45	1.0 X R0.2	2.5	45	4	
2CL 100 R030 45	1.0 X R0.3	2.5	45	4	
2CL 120 R010 45	1.2 X R0.1	3	45	4	
2CL 120 R020 45	1.2 X R0.2	3	45	4	
2CL 150 R010 45	1.5 X R0.1	4	45	4	
2CL 150 R020 45	1.5 X R0.2	4	45	4	
2CL 150 R030 45	1.5 X R0.3	4	45	4	
2CL 150 R050 45	1.5 X R0.5	4	45	4	
2CL 200 R010 45	2.0 X R0.1	6	45	4	
2CL 200 R020 45	2.0 X R0.2	6	45	4	
2CL 200 R030 45	2.0 X R0.3	6	45	4	
2CL 200 R050 45	2.0 X R0.5	6	45	4	
2CL 300 R010 60	3.0 X R0.1	8	60	6	
2CL 300 R020 60	3.0 X R0.2	8	60	6	
2CL 300 R030 60	3.0 X R0.3	8	60	6	
2CL 300 R050 60	3.0 X R0.5	8	60	6	
2CL 400 R010 70	4.0 X R0.1	11	70	6	
2CL 400 R020 70	4.0 X R0.2	11	70	6	
2CL 400 R030 70	4.0 X R0.3	11	70	6	
2CL 400 R050 70	4.0 X R0.5	11	70	6	
2CL 400 R100 70	4.0 X R1.0	11	70	6	
2CL 500 R020 75	5.0 X R0.2	13	75	6	

2날 코너 R 롱
2F Corner Radius-Long

2CL

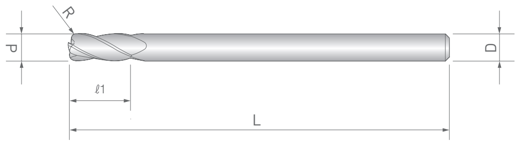
For Hardened Steels

(Unit: mm)

제품 번호 Product No.	날경 X 코너R Cutting Dia. X Corner R (d x CR)	날장 Length of Cut ℓ1	전장 Overall Length L	섕크경 Shank Dia. D	비 고
2CL 600 R010 90	6.0 X R0.1	13	90	6	
2CL 600 R020 90	6.0 X R0.2	13	90	6	
2CL 600 R030 90	6.0 X R0.3	13	90	6	
2CL 600 R050 90	6.0 X R0.5	13	90	6	
2CL 600 R100 90	6.0 X R1.0	13	90	6	
2CL 600 R150 90	6.0 X R1.5	13	90	6	
2CL 800 R010 90	8.0 X R0.1	19	90	8	
2CL 800 R020 90	8.0 X R0.2	19	90	8	
2CL 800 R030 90	8.0 X R0.3	19	90	8	
2CL 800 R050 90	8.0 X R0.5	19	90	8	
2CL 800 R050 100	8.0 X R0.5	19	100	8	
2CL 800 R100 90	8.0 X R1.0	19	90	8	
2CL 800 R100 100	8.0 X R1.0	19	100	8	
2CL 800 R200 90	8.0 X R2.0	19	90	8	
2CL 1000 R020 100	10.0 X R0.2	22	100	10	
2CL 1000 R030 100	10.0 X R0.3	22	100	10	
2CL 1000 R050 100	10.0 X R0.5	22	100	10	
2CL 1000 R050 130	10.0 X R0.5	22	130	10	
2CL 1000 R100 100	10.0 X R1.0	22	100	10	
2CL 1000 R100 130	10.0 X R1.0	22	130	10	
2CL 1000 R150 100	10.0 X R1.5	22	100	10	
2CL 1000 R200 100	10.0 X R2.0	22	100	10	
2CL 1000 R250 100	10.0 X R2.5	22	100	10	
2CL 1200 R050 100	12.0 X R0.5	26	100	12	
2CL 1200 R050 130	12.0 X R0.5	26	130	12	
2CL 1200 R100 100	12.0 X R1.0	26	100	12	
2CL 1200 R100 130	12.0 X R1.0	26	130	12	
2CL 1200 R150 100	12.0 X R1.5	26	100	12	
2CL 1200 R200 100	12.0 X R2.0	26	100	12	

4날 코너 R 롱
4F Corner Radius-Long
4CL

4 | HX30° | M/G Carbide | AlTiSiN Coated



Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 코너R Cutting Dia. X Corner R (d x CR)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4CL 150 R020 45	1.5 X R0.2	4	45	4	
4CL 150 R030 45	1.5 X R0.3	4	45	4	
4CL 200 R020 45	2.0 X R0.2	6	45	4	
4CL 200 R030 45	2.0 X R0.3	6	45	4	
4CL 200 R050 45	2.0 X R0.5	6	45	4	
4CL 300 R020 60	3.0 X R0.2	8	60	6	
4CL 300 R030 60	3.0 X R0.3	8	60	6	
4CL 300 R050 60	3.0 X R0.5	8	60	6	
4CL 400 R020 70	4.0 X R0.2	11	70	6	
4CL 400 R030 70	4.0 X R0.3	11	70	6	
4CL 400 R050 70	4.0 X R0.5	11	70	6	
4CL 400 R100 70	4.0 X R1.0	11	70	6	
4CL 500 R050 70	5.0 X R0.5	11	70	6	
4CL 600 R020 80	6.0 X R0.2	13	80	6	
4CL 600 R030 60	6.0 X R0.3	13	60	6	
4CL 600 R030 80	6.0 X R0.3	13	80	6	
4CL 600 R050 60	6.0 X R0.5	13	60	6	
4CL 600 R050 80	6.0 X R0.5	13	80	6	
4CL 600 R100 60	6.0 X R1.0	13	60	6	
4CL 600 R100 80	6.0 X R1.0	13	80	6	
4CL 600 R150 80	6.0 X R1.5	13	80	6	
4CL 800 R020 90	8.0 X R0.2	19	90	8	
4CL 800 R030 90	8.0 X R0.3	19	90	8	
4CL 800 R050 70	8.0 X R0.5	19	70	8	

4날 코너 R 롱

4F Corner Radius-Long

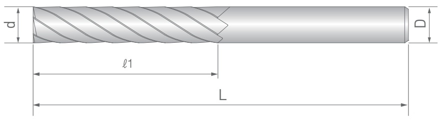
4CL

(Unit: mm)

제품 번호 Product No.	날경 X 코너R Cutting Dia. X Corner R (d x CR)	날장 Length of Cut ℓ1	전장 Overall Length L	섕크경 Shank Dia. D	비 고
4CL 800 R050 90	8.0 X R0.5	19	90	8	
4CL 800 R100 70	8.0 X R1.0	19	70	8	
4CL 800 R100 90	8.0 X R1.0	19	90	8	
4CL 1000 R050 75	10.0 X R0.5	22	75	10	
4CL 1000 R050 100	10.0 X R0.5	22	100	10	
4CL 1000 R100 75	10.0 X R1.0	22	75	10	
4CL 1000 R100 100	10.0 X R1.0	22	100	10	
4CL 1000 R150 100	10.0 X R1.5	22	100	10	
4CL 1200 R050 80	12.0 X R0.5	26	80	12	
4CL 1200 R050 110	12.0 X R0.5	26	110	12	
4CL 1200 R100 80	12.0 X R1.0	26	80	12	
4CL 1200 R100 110	12.0 X R1.0	26	110	12	
4CL 1200 R200 110	12.0 X R2.0	26	110	12	

6날 평 표준
6F Square-Regular
6SR

6 | HX45° | M/G Carbide | AlTiSiN Coated



Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

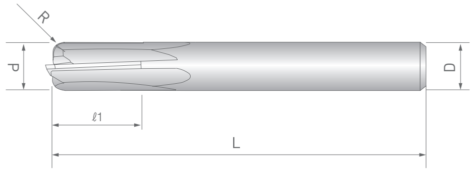
탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
6SR 600 1500 50	6	15	50	6	
6SR 600 2000 60	6	20	60	6	
6SR 600 2500 65	6	25	65	6	
6SR 600 3000 70	6	30	70	6	
6SR 800 2500 65	8	25	65	8	
6SR 800 3000 70	8	30	70	8	
6SR 800 3500 90	8	35	90	8	
6SR 800 4000 90	8	40	90	8	
6SR 1000 3500 80	10	35	80	10	
6SR 1000 4500 100	10	45	100	10	
6SR 1000 5500 110	10	55	110	10	
6SR 1200 4000 90	12	40	90	12	
6SR 1200 5000 100	12	50	100	12	
6SR 1200 6000 110	12	60	110	12	
6SR 1600 4500 100	16	45	100	16	
6SR 1600 5000 110	16	50	110	16	
6SR 1600 8000 150	16	80	150	16	
6SR 2000 5000 110	20	50	110	20	
6SR 2000 8000 150	20	80	150	20	
6SR 2000 10000 160	20	100	160	20	

4날 코너 R-고이송용
4F Corner Radius for High Feed Rate
4CF

4 M/G Carbide AlTiSiN Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality
- Suitable for roughing and semi-roughing at higher feed rate

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함
- 고이송 황삭 및 중삭에 적합

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

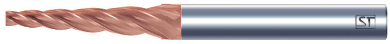
(Unit: mm)

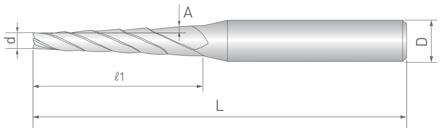
제품 번호 Product No.	날경 X 코너R Cutting Dia. X Corner R (d x CR)	날장 Length of Cut ℓ1	각도 Angle A (°)	유효장 Length of Reach l2	전장 Overall Length L	생크경 Shank Dia. D	비 고
4CF 600 R100 60	6.0 X R1.0	9	16	60	6	6	
4CF 800 R100 65	8.0 X R1.0	12	25	65	8	6	
4CF 1000 R200 70	10.0 X R2.0	15	25	70	10	6	
4CF 1000 R200 100	10.0 X R2.0	15	30	100	10	6	
4CF 1200 R200 70	12.0 X R2.0	18	30	70	12	6	
4CF 1200 R200 100	12.0 X R2.0	18	35	100	12	6	

4날 테이퍼 엔드밀
4F Tapered End Mill

4TE

4 HX30° M/G Carbide AlTiSiN Coated





Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	△	○	○	◎	○	○	△			

(Unit: mm)

제품 번호 Product No.	각도 Angle A (°)	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4TE 050 070 400	0.5	0.7	4	45	4	
4TE 050 070 600	0.5	0.7	6	45	4	
4TE 050 070 800	0.5	0.7	8	45	4	
4TE 050 080 400	0.5	0.8	4	45	4	
4TE 050 080 600	0.5	0.8	6	45	4	
4TE 050 080 800	0.5	0.8	8	45	4	
4TE 050 080 1000	0.5	0.8	10	45	4	
4TE 050 100 600	0.5	1	6	45	4	
4TE 050 100 800	0.5	1	8	45	4	
4TE 050 100 1000	0.5	1	10	45	4	
4TE 050 100 1200	0.5	1	12	45	4	
4TE 100 070 400	1	0.7	4	45	4	
4TE 100 070 600	1	0.7	6	45	4	
4TE 100 070 800	1	0.7	8	45	4	
4TE 100 080 400	1	0.8	4	45	4	
4TE 100 080 600	1	0.8	6	45	4	
4TE 100 080 800	1	0.8	8	45	4	
4TE 100 080 1000	1	0.8	10	45	4	
4TE 100 100 600	1	1	6	45	4	
4TE 100 100 800	1	1	8	45	4	
4TE 100 100 1000	1	1	10	45	4	
4TE 100 100 1200	1	1	12	45	4	

스타공구(주)
Star Tool Co., Ltd.

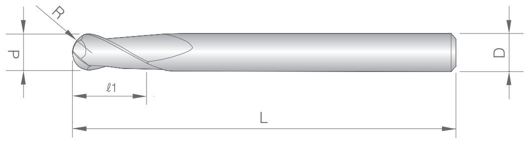
Economic Series

SPEED-1

2날 볼-이코노믹
2F Ball End-Economic

2BRE

2 | HX30° | M/G Carbide | AlTiCrSiN Coated



Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BRE 020 040 S4	0.2 X R0.1	0.4	40	4	
2BRE 030 060 S4	0.3 X R0.15	0.6	40	4	
2BRE 040 080 S4	0.4 X R0.2	0.8	40	4	
2BRE 050 100 S4	0.5 X R0.25	1	45	4	
2BRE 060 120 S4	0.6 X R0.3	1.2	45	4	
2BRE 070 140 S4	0.7 X R0.35	1.4	45	4	
2BRE 080 160 S4	0.8 X R0.4	1.6	45	4	
2BRE 100 150 S4	1.0 X R0.5	1.5	45	4	
2BRE 100 250 S4	1.0 X R0.5	2.5	45	4	
2BRE 150 200 S4	1.5 X R0.75	2	45	4	
2BRE 150 300 S4	1.5 X R0.75	3	45	4	
2BRE 200 400 S4	2.0 X R1.0	4	45	4	
2BRE 250 500 S6	2.5 X R1.25	5	45	6	
2BRE 300 500 S4	3.0 X R1.5	5	45	4	
2BRE 300 500 S6	3.0 X R1.5	5	50	6	
2BRE 400 600 S4	4.0 X R2.0	6	45	4	
2BRE 400 600 S6	4.0 X R2.0	6	50	6	
2BRE 600 900 50	6.0 X R3.0	9	50	6	
2BRE 600 1200 60	6.0 X R3.0	12	60	6	
2BRE 600 1200 90	6.0 X R3.0	12	90	6	
2BRE 800 1400 90	8.0 X R4.0	14	90	8	
2BRE 1000 1800 90	10.0 X R5.0	18	90	10	
2BRE 1200 2200 100	12.0 X R6.0	22	100	12	
2BRE 1600 3000 110	16.0 X R8.0	30	110	16	

2날 볼-이코노믹
2F Ball End-Economic

2BRE

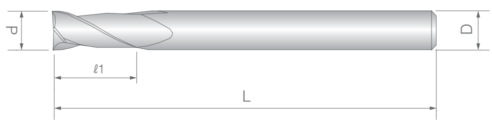
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BRE 1600 3000 160	16.0 X R8.0	30	160	16	
2BRE 2000 4000 150	20.0 X R10.0	40	150	20	

2날 평-이코노믹
2F Square End-Economic

2SRE

2 | HX30° | M/G Carbide | AlTiCrSiN Coated



Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SRE 020 040 S4	0.2	0.4	40	4	
2SRE 030 060 S4	0.3	0.6	40	4	
2SRE 040 080 S4	0.4	0.8	40	4	
2SRE 050 100 S4	0.5	1	45	4	
2SRE 060 120 S4	0.6	1.2	45	4	
2SRE 070 140 S4	0.7	1.4	45	4	
2SRE 080 160 S4	0.8	1.6	45	4	
2SRE 100 150 S4	1	1.5	45	4	
2SRE 100 250 S4	1	2.5	45	4	
2SRE 150 200 S4	1.5	2	45	4	
2SRE 150 400 S4	1.5	4	45	4	
2SRE 200 350 S4	2	3.5	45	4	
2SRE 200 600 S4	2	6	45	4	
2SRE 250 800 S4	2.5	8	45	4	
2SRE 300 800 S4	3	8	45	4	
2SRE 400 1000 S4	4	10	45	4	
2SRE 500 1000 S6	5	10	50	6	
2SRE 500 1300 S6	5	13	50	6	
2SRE 600 1300 S6	6	13	50	6	
2SRE 600 1500 S6	6	15	50	6	
2SRE 800 1600 S8	8	16	60	8	
2SRE 800 1900 S8	8	19	60	8	
2SRE 1000 1800 S10	10	18	70	10	
2SRE 1000 2200 S10	10	22	70	10	

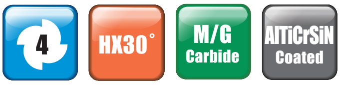
2날 평-이코노믹
2F Square End-Economic
2SRE

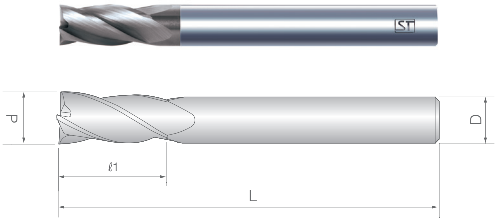
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SRE 1200 2200 S12	12	22	75	12	
2SRE 1200 2600 S12	12	26	75	12	
2SRE 1600 4000 S16	16	40	100	16	
2SRE 2000 5000 S20	20	50	110	20	

4날 평-이코노믹
4F Square End-Economic

4SRE





Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

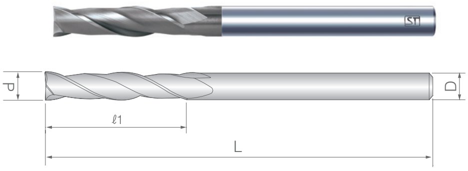
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4SRE 100 250 S4	1	2.5	45	4	
4SRE 150 400 S4	1.5	4	45	4	
4SRE 200 350 S4	2	3.5	45	4	
4SRE 200 600 S4	2	6	45	4	
4SRE 300 500 S4	3	5	45	4	
4SRE 300 800 S4	3	8	45	4	
4SRE 400 600 S4	4	6	45	4	
4SRE 400 1100 S4	4	11	45	4	
4SRE 500 1300 S6	5	13	50	6	
4SRE 600 1300 S6	6	13	45	6	
4SRE 600 1500 S6	6	15	45	6	
4SRE 800 1600 S8	8	16	60	8	
4SRE 800 1900 S8	8	19	60	8	
4SRE 1000 1800 S10	10	18	70	10	
4SRE 1000 2200 S10	10	22	70	10	
4SRE 1200 2200 S12	12	22	75	12	
4SRE 1200 2600 S12	12	26	75	12	
4SRE 1600 4000 S16	16	40	100	16	
4SRE 2000 4000 S20	20	40	100	20	

2날 평 롱-이코노믹
2F Square End-Long-Economic

2SLE

2 | HX30° | M/G Carbide | AlTiCrSiN Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

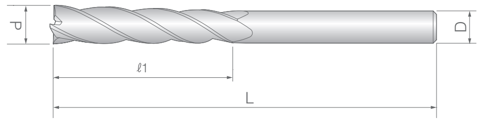
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SLE 100 500 60	1	5	60	4	
2SLE 150 800 60	1.5	8	60	4	
2SLE 200 800 60	2	8	60	4	
2SLE 300 1500 70	3	15	70	6	
2SLE 400 2000 70	4	20	70	6	
2SLE 600 2000 70	6	20	70	6	
2SLE 600 3000 80	6	30	80	6	
2SLE 800 2500 75	8	25	75	8	
2SLE 800 4000 90	8	40	90	8	
2SLE 1000 3000 80	10	30	80	10	
2SLE 1000 5000 100	10	50	100	10	
2SLE 1200 3000 90	12	30	90	12	
2SLE 1200 5000 100	12	50	100	12	
2SLE 1600 4000 150	16	40	150	16	
2SLE 2000 5000 150	20	50	150	20	

4날 평 롱-이코노믹
4F Square End-Long-Economic

4SLE

4 | HX30° | M/G Carbide | AlTiCrSiN Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징

- 초미립 조경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

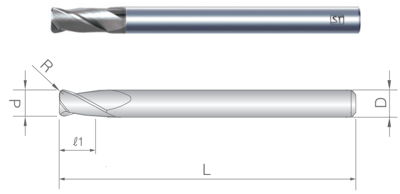
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	섕크경 Shank Dia. D	비 고
4SLE 200 800 60	2	8	60	6	
4SLE 300 1200 70	3	12	70	6	
4SLE 400 1500 70	4	15	70	6	
4SLE 400 2000 70	4	20	70	6	
4SLE 600 2000 70	6	20	70	6	
4SLE 600 3000 80	6	30	80	6	
4SLE 800 2500 75	8	25	75	8	
4SLE 800 4000 90	8	40	90	8	
4SLE 1000 3000 80	10	30	80	10	
4SLE 1000 5000 100	10	50	100	10	
4SLE 1200 3000 90	12	30	90	12	
4SLE 1200 5000 100	12	50	100	12	
4SLE 1600 4000 160	16	40	160	16	
4SLE 2000 5000 160	20	50	160	20	

2날 코너 R 롱-이코노믹
2F Corner Radius-Long-Economic

2CLE

2 | HX30° | M/G Carbide | AlTiCrSiN Coated



Features

- Used micrograin solid carbide excellent for high speed cutting:
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2CLE 100 R020 45	1.0 X R0.2	2.5	45	4	
2CLE 150 R020 45	1.5 X R0.2	4	45	4	
2CLE 200 R020 45	2.0 X R0.2	4	45	4	
2CLE 200 R030 45	2.0 X R0.3	4	45	4	
2CLE 300 R020 50	3.0 X R0.2	6	50	4	
2CLE 300 R030 50	3.0 X R0.3	6	50	4	
2CLE 300 R050 50	3.0 X R0.5	6	50	4	
2CLE 400 R020 70	4.0 X R0.2	8	70	6	
2CLE 400 R030 70	4.0 X R0.3	8	70	6	
2CLE 400 R050 70	4.0 X R0.5	8	70	6	
2CLE 400 R100 70	4.0 X R1.0	8	70	6	
2CLE 600 R020 90	6.0 X R0.2	12	90	6	
2CLE 600 R030 90	6.0 X R0.3	12	90	6	
2CLE 600 R050 90	6.0 X R0.5	12	90	6	
2CLE 600 R100 90	6.0 X R1.0	12	90	6	
2CLE 800 R020 90	8.0 X R0.2	16	90	8	
2CLE 800 R030 90	8.0 X R0.3	16	90	8	
2CLE 800 R050 90	8.0 X R0.5	16	90	8	
2CLE 800 R050 100	8.0 X R0.5	16	100	8	
2CLE 800 R100 90	8.0 X R1.0	16	90	8	
2CLE 800 R100 100	8.0 X R1.0	16	100	8	
2CLE 1000 R050 100	10.0 X R0.5	18	100	10	
2CLE 1000 R050 130	10.0 X R0.5	18	130	10	
2CLE 1000 R100 100	10.0 X R1.0	18	100	10	

2날 코너 R 롱-이코노믹
2F Corner Radius-Long-Economic

2CLE

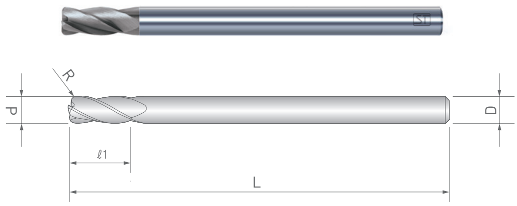
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2CLE 1000 R100 130	10.0 X R1.0	18	130	10	
2CLE 1200 R050 100	12.0 X R0.5	22	100	12	
2CLE 1200 R050 130	12.0 X R0.5	22	130	12	
2CLE 1200 R100 100	12.0 X R1.0	22	100	12	
2CLE 1200 R100 130	12.0 X R1.0	22	130	12	

4날 코너 R 롱-이코노믹
4F Corner Radius-Long-Economic

4CLE

4 | HX30° | M/G Carbide | AlTiCrSiN Coated



Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Nanocomposite coatings for improved wear resistance and longer tool life
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 나노컴포지트 코팅 처리로 공구 수명이 길어지고 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4CLE 150 R020 45	1.5 X R0.2	3	45	4	
4CLE 150 R030 45	1.5 X R0.3	3	45	4	
4CLE 200 R020 45	2.0 X R0.2	4	45	4	
4CLE 300 R020 60	3.0 X R0.2	6	60	6	
4CLE 300 R030 60	3.0 X R0.3	6	60	6	
4CLE 300 R050 45	3.0 X R0.5	6	45	4	
4CLE 300 R050 60	3.0 X R0.5	6	60	6	
4CLE 400 R020 70	4.0 X R0.2	8	70	6	
4CLE 400 R030 70	4.0 X R0.3	8	70	6	
4CLE 400 R050 45	4.0 X R0.5	8	45	4	
4CLE 400 R050 70	4.0 X R0.5	8	70	6	
4CLE 600 R020 80	6.0 X R0.2	12	80	6	
4CLE 600 R030 60	6.0 X R0.3	12	60	6	
4CLE 600 R030 80	6.0 X R0.3	12	80	6	
4CLE 600 R050 60	6.0 X R0.5	12	60	6	
4CLE 600 R050 80	6.0 X R0.5	12	80	6	
4CLE 600 R100 60	6.0 X R1.0	12	60	6	
4CLE 600 R150 80	6.0 X R1.5	12	80	6	
4CLE 800 R020 90	8.0 X R0.2	16	90	8	
4CLE 800 R030 90	8.0 X R0.3	16	90	8	
4CLE 800 R050 60	8.0 X R0.5	16	60	8	
4CLE 800 R050 90	8.0 X R0.5	16	90	8	
4CLE 800 R100 60	8.0 X R1.0	16	60	8	
4CLE 800 R100 90	8.0 X R1.0	16	90	8	

4날 코너 R 롱-이코노믹

4F Corner Radius-Long-Economic

4CLE

(Unit: mm)

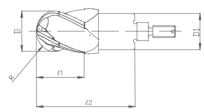
제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4CLE 1000 R050 75	10.0 X R0.5	20	75	10	
4CLE 1000 R050 100	10.0 X R0.5	20	100	10	
4CLE 1000 R100 75	10.0 X R1.0	20	75	10	
4CLE 1000 R100 100	10.0 X R1.0	20	100	10	
4CLE 1200 R050 80	12.0 X R0.5	24	80	12	
4CLE 1200 R050 100	12.0 X R0.5	24	100	12	
4CLE 1200 R100 80	12.0 X R1.0	24	80	12	
4CLE 1200 R100 100	12.0 X R1.0	24	100	12	
4CLE 1200 R200 100	12.0 X R2.0	24	100	12	
4CLE 1600 R050 110	16.0 X R0.5	28	110	16	
4CLE 1600 R100 110	16.0 X R1.0	28	110	16	

4날 볼 헤드 체인지 엔드밀

4F Replaceable Modular Ball Nose Endmill

4RBM

4 | HX45° | M/G Carbide | AlTiCrSiN Coated



Features

- Carbide to Carbide with the thread can guarantee More Increased Rigidity and Non-Vibration Machining
- A variety of Modulars can be easily changed on a carbide holder

특징

- 나사산이 가공된 초경대 초경 조립으로 더욱 강하고, 떨림방지 엔드밀
- 하나의 초경홀더에 여러가지 사양의 모듈라들을 쉽게 교환가능.

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	헤드길이 Length of Modular l2	유효장경 Neck Dia D1	비 고
4RBM 1600165-M8	16XR8	16.5	29	15	
4RBM 2000210-M8	20XR10	21	37	19	
4RBM 2500250-M8	25XR12.5	25	43	24	

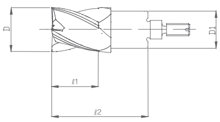
Economic Series

4날 평 헤드 체인지 엔드밀

4F Replaceable Modular Square Endmill

4RSM

4 | HX45° | M/G Carbide | AlTiCrSiN Coated



Features

- Carbide to Carbide with the thread can guarantee More Increased Rigidity and Non-Vibration Machining
- A variety of Modulars can be easily changed on a carbide holder

특징

- 나사산이 가공된 초경대 초경 조립으로 더욱 강하고, 떨림방지 엔드밀
- 하나의 초경홀더에 여러가지 사양의 모듈라들을 쉽게 교환가능.

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

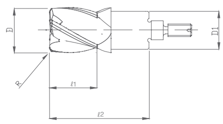
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	헤드길이 Length of Modular l2	유효장경 Neck Dia D1	비 고
4RSM 1600165-M8	16	16.5	29	15	
4RSM 1600300-M8	16	28	40	15	
4RSM 2000210-M8	20	21	37	19	
4RSM 2000400-M8	20	40	56	19	
4RSM 2500250-M8	25	25	43	24	

4날 코너 R 헤드 체인지 엔드밀
4F Replaceable Modular Corner "R" Endmill

4RCM

4 | HX45° | M/G Carbide | AlTiCrSiN Coated



Features

- Carbide to Carbide with the thread can guarantee More Increased Rigidity and Non-Vibration Machining
- A variety of Modulars can be easily changed on a carbide holder

특징

- 나사산이 가공된 초경대 초경 조립으로 더욱 강하고, 떨림방지 엔드밀
- 하나의 초경홀더에 여러가지 사양의 모듈라들을 쉽게 교환가능.

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎	△	◎	◎	○		○	△			

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	헤드길이 Length of Modular l2	유효장경 Neck Dia D1	비 고
4RCM 1600R050-M8	16XR0.5	16.5	29	15	
4RCM 1600R100-M8	16XR1.0	16.5	29	15	
4RCM 1600R150-M8	16XR1.5	16.5	29	15	
4RCM 1600R200-M8	16XR2.0	16.5	29	15	
4RCM 1600R250-M8	16XR2.5	16.5	29	15	
4RCM 1600R300-M8	16XR3.0	16.5	29	15	
4RCM 2000R050-M10	20XR0.5	21	37	19	
4RCM 2000R100-M10	20XR1.0	21	37	19	
4RCM 2000R150-M10	20XR1.5	21	37	19	
4RCM 2000R200-M10	20XR2.0	21	37	19	
4RCM 2000R250-M10	20XR2.5	21	37	19	
4RCM 2000R300-M10	20XR3.0	21	37	19	
4RCM 2500R100-M12	25XR1.0	25	43	24	
4RCM 2500R200-M12	25XR2.0	25	43	24	
4RCM 2500R300-M12	25XR3.0	25	43	24	
4RCM 2500R500-M12	25XR5.0	25	43	24	

스타공구(주)
Star Tool Co., Ltd.

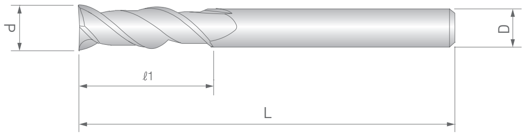
For Others

SPEED-1

2날 평-알루미늄 가공용
2F Square End for Aluminum

2SA

2 | Helix 45˚ | M/G Carbide | Uncoated



Features

- For use on aluminum alloy and non-ferrous materials
- Provides higher metal removal rate
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Improved workpiece surface quality

특징

- AL 및 비철용으로 적합
- 보다 넓은 칩포켓으로 가공성 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
							△	◎	△	

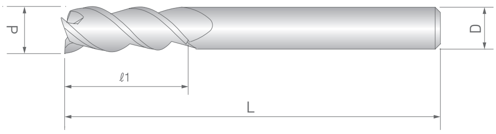
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SA 100 250	1	2.5	45	6	
2SA 150 400	1.5	4	45	6	
2SA 200 600	2	6	50	6	
2SA 200 1000	2	10	50	6	
2SA 300 800	3	8	50	6	
2SA 300 1500	3	15	50	6	
2SA 400 1100	4	11	50	6	
2SA 400 1600	4	16	60	6	
2SA 600 1600	6	16	50	6	
2SA 600 2000	6	20	60	6	
2SA 600 2500	6	25	65	6	
2SA 800 2000	8	20	60	8	
2SA 800 3000	8	30	70	8	
2SA 1000 2500	10	25	75	10	
2SA 1000 3500	10	35	80	10	
2SA 1200 3000	12	30	80	12	
2SA 1200 3500	12	35	80	12	

3날 평-알루미늄 가공용
3F Square End for Aluminum

3SA

3 | Helix 45° | M/G Carbide | Uncoated



Features
- For use on aluminum alloy and non-ferrous materials
- Provides higher metal removal rate
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Improved workpiece surface quality

특징
- AL 및 비철용으로 적합
- 보다 넓은 칩포켓으로 가공성 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
							△	◎	△	

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
3SA 100 200	1	2	45	6	
3SA 100 300	1	3	45	6	
3SA 100 500	1	5	45	6	
3SA 150 300	1.5	3	45	6	
3SA 150 500	1.5	5	45	6	
3SA 150 800	1.5	8	45	6	
3SA 200 300	2	3	45	6	
3SA 200 700	2	7	45	6	
3SA 200 1000	2	10	50	6	
3SA 200 1200	2	12	50	6	
3SA 300 400	3	4	45	6	
3SA 300 800	3	8	50	6	
3SA 300 1300	3	13	50	6	
3SA 300 1500	3	15	50	6	
3SA 300 2000	3	20	55	6	
3SA 300 2500	3	25	60	6	
3SA 400 600	4	6	45	6	
3SA 400 1100	4	11	50	6	
3SA 400 1600	4	16	50	6	
3SA 400 2000	4	20	55	6	
3SA 400 2500	4	25	60	6	
3SA 400 3000	4	30	70	6	
3SA 500 700	5	7	50	6	
3SA 500 2000	5	20	55	6	

3날 평-알루미늄 가공용
3F Square End for Aluminum

3SA

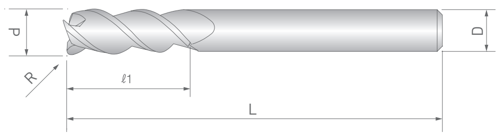
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	섕크경 Shank Dia. D	비 고
3SA 500 3000	5	30	65	6	
3SA 600 900	6	9	50	6	
3SA 600 1600	6	16	50	6	
3SA 600 2000	6	20	60	6	
3SA 600 2500	6	25	60	6	
3SA 600 3000	6	30	70	6	
3SA 800 1200	8	12	60	8	
3SA 800 2000	8	20	60	8	
3SA 800 3000	8	30	70	8	
3SA 800 4000	8	40	80	8	
3SA 800 5500	8	55	100	8	
3SA 1000 1500	10	15	70	10	
3SA 1000 2500	10	25	70	10	
3SA 1000 3500	10	35	80	10	
3SA 1000 5500	10	55	100	10	
3SA 1200 2600	12	26	75	12	
3SA 1200 3000	12	30	80	12	
3SA 1200 3500	12	35	80	12	
3SA 1400 4500	14	45	100	14	
3SA 1600 6000	16	60	110	16	
3SA 2000 7500	20	75	130	20	

3날 코너 R-알루미늄 가공용
3F Corner Radius End for Aluminum

3CA

3 | Helix 45° | M/G Carbide | Uncoated



Features
- For use on aluminum alloy and non-ferrous materials
- Provides higher metal removal rate
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Improved workpiece surface quality

특징
- AL 및 비철용으로 적합
- 보다 넓은 칩포켓으로 가공성 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

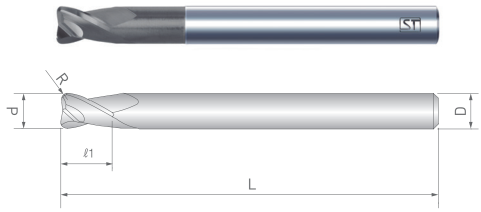
탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
							△	◎	△	

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	헤드길이 Length of Modular l2	유효장경 Neck Dia D1	비 고
3CA 300 R020 50	3.0 X R0.2	8	50	6	
3CA 300 R030 50	3.0 X R0.3	8	50	6	
3CA 300 R050 50	3.0 X R0.5	8	50	6	
3CA 400 R030 50	4.0 X R0.3	11	50	6	
3CA 400 R050 50	4.0 X R0.5	11	50	6	
3CA 400 R100 50	4.0 X R1.0	11	50	6	
3CA 600 R030 60	6.0 X R0.3	16	60	6	
3CA 600 R050 60	6.0 X R0.5	16	60	6	
3CA 600 R100 60	6.0 X R1.0	16	60	6	
3CA 800 R050 65	8.0 X R0.5	20	65	8	
3CA 800 R100 65	8.0 X R1.0	20	65	8	
3CA 1000 R050 70	10.0 X R0.5	25	70	10	
3CA 1000 R100 70	10.0 X R1.0	25	70	10	
3CA 1000 R200 70	10.0 X R2.0	25	70	10	
3CA 1200 R050 75	12.0 X R0.5	26	75	12	
3CA 1200 R100 75	12.0 X R1.0	26	75	12	
3CA 1200 R200 75	12.0 X R2.0	26	75	12	
3CA 1200 R300 75	12.0 X R3.0	26	75	12	
3CA 1600 R100 90	16.0 X R1.0	35	90	16	
3CA 1600 R200 90	16.0 X R2.0	35	90	16	
3CA 1600 R300 90	16.0 X R3.0	35	90	16	

2날 코너 R-동 가공용
2F Corner Radius for Copper

2CC



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- AlTiN coating for improved wear resistance
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- AlTiN 코팅 처리로 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
△		△				△	◎	△		

(Unit: mm)

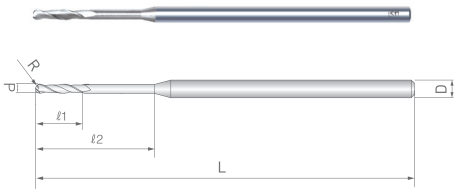
제품 번호 Product No.	날경 X 코너R Cutting Dia. X Corner R d X CR	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2CC 200 R030 S4	2.0 X R0.3	3	10	45	4	
2CC 200 R050 S4	2.0 X R0.5	3	10	45	4	
2CC 300 R050 S6	3.0 X R0.5	4.5	12	50	6	
2CC 400 R030 S6	4.0 X R0.3	6	20	60	6	
2CC 400 R050 S6	4.0 X R0.5	6	20	60	6	
2CC 600 R050 S6	6.0 X R0.5	9	20	60	6	
2CC 600 R100 S6	6.0 X R1.0	9	20	60	6	
2CC 800 R050 S8	8.0 X R0.5	12	24	65	8	
2CC 800 R100 S8	8.0 X R1.0	12	24	65	8	
2CC 1000 R050 S10	10.0 X R0.5	20	30	70	10	
2CC 1000 R100 S10	10.0 X R1.0	20	30	70	10	
2CC 1200 R050 S12	12.0 X R0.5	20	30	80	12	
2CC 1200 R100 S12	12.0 X R1.0	20	30	80	12	

2날 볼-수지 비철 가공용

2F Ball End for Synthetic Materials

2BY

2 | HX30° | M/G Carbide | Uncoated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
								△	◎	△

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose d X R	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BY 030 070 45	0.3 X R0.15	0.7	-	45	3	
2BY 030 180 45	0.3 X R0.15	1.8	-	45	3	
2BY 050 100 50	0.5 X R0.25	1	-	50	3	
2BY 050 200 50	0.5 X R0.25	2	-	50	3	
2BY 100 500 60	1.0 X R0.5	5	-	60	3	
2BY 100 1000 60	1.0 X R0.5	5	10	60	3	
2BY 100 1500 60	1.0 X R0.5	5	15	60	3	
2BY 100 2000 70	1.0 X R0.5	5	20	70	3	
2BY 150 1000 60	1.5 X R0.75	10	-	60	3	
2BY 150 1500 70	1.5 X R0.75	10	15	70	3	
2BY 150 2000 70	1.5 X R0.75	10	20	70	3	
2BY 200 1000 60	2.0 X R1.0	10	-	60	3	
2BY 200 1500 60	2.0 X R1.0	10	15	60	3	
2BY 200 2000 70	2.0 X R1.0	10	20	70	3	
2BY 250 1000 60	2.5 X R1.25	10	-	60	3	
2BY 300 1000 60	3.0 X R1.5	10	-	60	3	
2BY 300 1500 60	3.0 X R1.5	15	-	60	3	
2BY 300 2000 80	3.0 X R1.5	20	-	80	3	
2BY 400 2000 80	4.0 X R2.0	20	-	80	4	
2BY 400 2000 100	4.0 X R2.0	20	-	100	4	
2BY 400 2000 130	4.0 X R2.0	20	-	130	4	
2BY 500 3000 100	5.0 X R2.5	30	-	100	6	
2BY 600 2000 100	6.0 X R3.0	20	-	100	6	
2BY 600 3000 80	6.0 X R3.0	30	-	80	6	
2BY 600 3000 100	6.0 X R3.0	30	-	100	6	
2BY 600 4000 100	6.0 X R3.0	40	-	100	6	
2BY 600 4000 120	6.0 X R3.0	40	-	120	6	

2날 볼-수지 비철 가공용
2F Ball End for Synthetic Materials

2BY

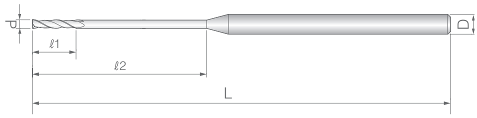
제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose d X R	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	섕크경 Shank Dia. D	비 고
2BY 600 4000 150	6.0 X R3.0	40	-	150	6	
2BY 800 4500 120	8.0 X R4.0	45	-	120	8	
2BY 800 4500 150	8.0 X R4.0	45	-	150	8	
2BY 1000 5000 120	10.0 X R5.0	50	-	120	10	
2BY 1000 5000 150	10.0 X R5.0	50	-	150	10	
2BY 1200 5000 130	12.0 X R6.0	50	-	130	12	
2BY 1200 5000 150	12.0 X R6.0	50	-	150	12	

2날 평-수지 비철 가공용

2F Square End for Synthetic Materials

2SY

2 | HX30° | M/G Carbide | Uncoated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- Improved workpiece surface quality

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
								△	◎	△

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	섕크경 Shank Dia. D	비 고
2SY 030 070 45	0.3	0.7	-	45	3	
2SY 030 180 45	0.3	1.8	-	45	3	
2SY 050 100 50	0.5	1	-	50	3	
2SY 050 500 50	0.5	1.5	5	50	3	
2SY 050 200 50	0.5	2	-	50	3	
2SY 070 500 50	0.7	1.5	5	50	3	
2SY 100 500 60	1	5	-	60	3	
2SY 100 1000 60	1	5	10	60	3	
2SY 100 1500 60	1	5	15	60	3	
2SY 100 2000 70	1	5	20	70	3	
2SY 150 1000 60	1.5	10	-	60	3	
2SY 150 1500 70	1.5	10	15	70	3	
2SY 150 2000 70	1.5	10	20	70	3	
2SY 200 1000 60	2	10	-	60	3	
2SY 200 1500 70	2	10	15	70	3	
2SY 200 2000 70	2	10	20	70	3	
2SY 250 1000 60	2.5	10	-	60	3	
2SY 300 1000 50	3	10	-	50	3	
2SY 300 1500 60	3	15	-	60	3	
2SY 300 2000 80	3	20	-	80	3	
2SY 400 2000 80	4	20	-	80	4	
2SY 500 3000 100	5	30	-	100	6	
2SY 600 3000 80	6	30	-	80	6	
2SY 600 4000 100	6	40	-	100	6	
2SY 600 4000 120	6	40	-	120	6	
2SY 600 4000 150	6	40	-	150	6	
2SY 800 4500 120	8	45	-	120	8	

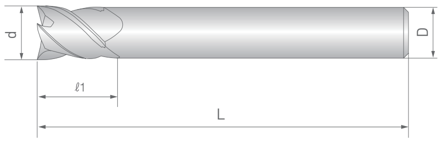
2날 평-수지 비철 가공용
2F Square End for Synthetic Materials

2SY

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SY 800 4500 150	8	45	-	150	8	
2SY 1000 3000 80	10	30	-	80	10	
2SY 1000 5000 120	10	50	-	120	10	
2SY 1000 5000 150	10	50	-	150	10	
2SY 1200 5000 130	12	50	-	130	12	
2SY 1200 5000 150	12	50	-	150	12	

4SS

4 | Helix 40° | M/G Carbide | AlTiN Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- AlTiN coating for improved wear resistance
- Improved workpiece surface quality
- Designed with 40° helix angle and variable flute spacing for use on stainless steels
- Faster cutting action and rapid chip evacuation

특징

- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- AlTiN 코팅 처리로 내마모성이 커짐
- 가공면의 조도가 우수함
- 40°의 헬릭스각과 부등분할로 설계로 SUS 가공에 적합함
- 칩 배출과 절삭성이 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

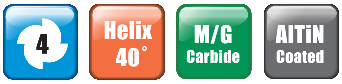
탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	◎	○		△		○	◎	○	△	

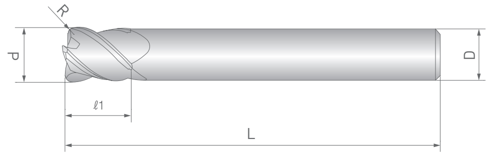
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	섕크경 Shank Dia. D	비 고
4SS 200 600 50	2	6	50	6	
4SS 300 1000 60	3	10	60	6	
4SS 400 1200 60	4	12	60	6	
4SS 600 1500 50	6	15	50	6	
4SS 600 2000 70	6	20	70	6	
4SS 800 1900 60	8	19	60	8	
4SS 1000 2200 70	10	22	70	10	
4SS 1200 2600 75	12	26	75	12	

4날 코너 R-SUS
4F Corner Radius for Stainless Steel

4CS





Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- AlTiN coating for improved wear resistance
- Improved workpiece surface quality
- Designed with 40° helix angle and variable flute spacing for use on stainless steels
- Faster cutting action and rapid chip evacuation

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- AlTiN 코팅 처리로 내마모성이 커짐
- 가공면의 조도가 우수함
- 40˚의 헬릭스각과 부등분할로 설계로 SUS 가공에 적합함
- 칩배출과 절삭성이 우수함

Tolerance :

Cutting Dia.	Corner Radius
d≤6: 0/-0.01 d>6: 0/-0.015	±0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
○	◎	○		△		○	◎	○	△	

(Unit: mm)

제품 번호 Product No.	날경 X 코너R Cutting Dia. X Corner R d X CR	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4CS 300 R020 S6	3.0 X R0.2	10	60	6	
4CS 300 R050 S6	3.0 X R0.5	10	60	6	
4CS 400 R020 S6	4.0 X R0.2	12	60	6	
4CS 400 R050 S6	4.0 X R0.5	12	60	6	
4CS 500 R020 S6	5.0 X R0.2	15	60	6	
4CS 500 R050 S6	5.0 X R0.5	15	60	6	
4CS 600 R030 S6	6.0 X R0.3	15	60	6	
4CS 600 R050 S6	6.0 X R0.5	15	60	6	
4CS 600 R100 S6	6.0 X R1.0	15	60	6	
4CS 800 R030 S8	8.0 X R0.3	20	80	8	
4CS 800 R050 S8	8.0 X R0.5	20	80	8	
4CS 800 R100 S8	8.0 X R1.0	20	80	8	
4CS 1000 R030 S10	10.0 X R0.3	25	80	10	
4CS 1000 R050 S10	10.0 X R0.5	25	80	10	
4CS 1000 R100 S10	10.0 X R1.0	25	80	10	
4CS 1200 R050 S12	12.0 X R0.5	30	80	12	
4CS 1200 R100 S12	12.0 X R1.0	30	80	12	
4CS 1200 R150 S12	12.0 X R1.5	30	80	12	

For Graphite

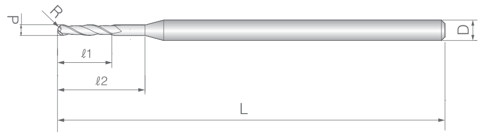
SPEED-1

ST

2날 볼-흑연 가공용
2F Ball End for Graphite

2BG

2 | HX30° | M/G Carbide | AlTiN Coated



Features

- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- AlTiN coating for improved wear resistance
- Improved workpiece surface quality

특징

- 초미립 조경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- AlTiN 코팅 처리로 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
△		△					△	△	△	◎

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BG 050 200 50	0.5 X R0.25	2	-	50	4	
2BG 050 500 50	0.5 X R0.25	2	5	50	4	
2BG 100 500 60	1.0 X R0.5	5	-	60	4	
2BG 100 1000 60	1.0 X R0.5	5	10	60	4	
2BG 100 1500 60	1.0 X R0.5	5	15	60	4	
2BG 100 2000 80	1.0 X R0.5	5	20	80	4	
2BG 100 2500 80	1.0 X R0.5	5	25	80	4	
2BG 150 1000 60	1.5 X R0.75	10	-	60	4	
2BG 150 1500 60	1.5 X R0.75	10	15	60	4	
2BG 150 2000 60	1.5 X R0.75	10	20	60	4	
2BG 200 1000 60	2.0 X R1.0	10	-	60	4	
2BG 200 2000 60	2.0 X R1.0	10	20	60	4	
2BG 200 3000 80	2.0 X R1.0	10	30	80	4	
2BG 200 3000 100	2.0 X R1.0	10	30	100	4	
2BG 200 4000 80	2.0 X R1.0	10	40	80	4	
2BG 200 4000 100	2.0 X R1.0	10	40	100	4	
2BG 250 2000 70	2.5 X R1.25	10	20	70	4	
2BG 300 2000 70	3.0 X R1.5	10	20	70	4	
2BG 300 3000 80	3.0 X R1.5	10	30	80	4	
2BG 400 2000 80	4.0 X R2.0	20	-	80	4	
2BG 400 2000 100	4.0 X R2.0	20	-	100	4	
2BG 400 2000 130	4.0 X R2.0	20	-	130	4	
2BG 500 2500 100	5.0 X R2.5	25	-	100	6	

2날 볼-흑연 가공용
2F Ball End for Graphite

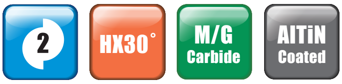
2BG

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BG 600 3000 80	6.0 X R3.0	30	-	80	6	
2BG 600 3000 100	6.0 X R3.0	30	-	100	6	
2BG 600 4000 150	6.0 X R3.0	40	-	150	6	
2BG 800 4500 120	8.0 X R4.0	45	-	120	8	
2BG 800 4500 150	8.0 X R4.0	45	-	150	8	
2BG 1000 5000 120	10.0 X R5.0	50	-	120	10	
2BG 1000 5000 150	10.0 X R5.0	50	-	150	10	
2BG 1200 5000 130	12.0 X R6.0	50	-	130	12	
2BG 1200 5000 150	12.0 X R6.0	50	-	150	12	

2날 평-흑연 가공용
2F Square End for Graphite

2SG



Features
- Used micrograin solid carbide excellent for high speed cutting
- Greater rigidity and reduced chattering through optimized geometry
- AlTiN coating for improved wear resistance
- Improved workpiece surface quality

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음
- AlTiN 코팅 처리로 내마모성이 커짐
- 가공면의 조도가 우수함

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
△		△					△	△	△	◎

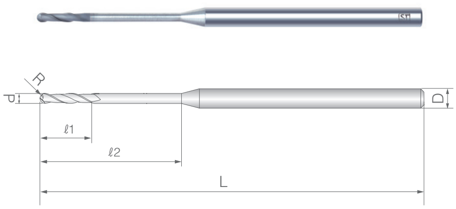
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2SG 050 100 50	0.5	1	-	50	4	
2SG 050 200 50	0.5	2	-	50	4	
2SG 050 600 50	0.5	0.7	6	50	4	
2SG 100 500 60	1	5		60	4	
2SG 100 1000 60	1	5	10	60	4	
2SG 100 1500 60	1	5	15	60	4	
2SG 100 2000 60	1	5	20	60	4	
2SG 150 1000 60	1.5	10	-	60	4	
2SG 150 1500 60	1.5	10	15	60	4	
2SG 150 2000 60	1.5	10	20	60	4	
2SG 200 1000 60	2	10	-	60	4	
2SG 200 1500 60	2	10	15	60	4	
2SG 200 2000 60	2	10	20	60	4	
2SG 200 2500 70	2	10	25	70	4	
2SG 200 3000 80	2	10	30	80	4	
2SG 300 1500 70	3	15	-	70	4	
2SG 300 2500 75	3	15	25	75	4	
2SG 300 3000 80	3	15	30	80	4	
2SG 400 2000 80	4	20	-	80	4	
2SG 400 2000 100	4	20	-	100	4	
2SG 500 3000 100	5	30	-	100	6	
2SG 600 3000 100	6	30	-	100	6	
2SG 600 4000 150	6	40	-	150	6	
2SG 800 4500 150	8	45	-	150	8	
2SG 1000 5000 150	10	50	-	150	10	
2SG 1200 6000 150	12	60	-	150	12	

2날 볼-다이아몬드 코팅
2F Ball End-Diamond Coated

2BD

2 | HX30° | M/G Carbide | Diamond Coated



Features
- Used micrograin solid carbide excellent for high speed cutting
- Diamond coated for improved abrasion resistance and higher feed rates
- Greater rigidity and reduced chattering through optimized geometry

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 고경도의 다이아몬드 코팅으로 내마모성이 커 고속가공이 가능함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
									△	◎

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BD 020 100 45	0.2 X R0.1	1	-	45	4	
2BD 030 120 45	0.3 X R0.15	1.2	-	45	4	
2BD 030 200 45	0.3 X R0.15	1.2	2	45	4	
2BD 040 150 45	0.4 X R0.2	1.5	-	45	4	
2BD 040 200 45	0.4 X R0.2	1.5	2	45	4	
2BD 040 300 45	0.4 X R0.2	1.5	3	45	4	
2BD 040 400 45	0.4 X R0.2	1.5	4	45	4	
2BD 040 500 45	0.4 X R0.2	1.5	5	45	4	
2BD 050 200 45	0.5 X R0.25	2	-	45	4	
2BD 050 300 45	0.5 X R0.25	2	3	45	4	
2BD 050 400 45	0.5 X R0.25	2	4	45	4	
2BD 050 500 45	0.5 X R0.25	2	5	45	4	
2BD 050 600 45	0.5 X R0.25	2	6	45	4	
2BD 050 800 45	0.5 X R0.25	2	8	45	4	
2BD 060 200 45	0.6 X R0.3	2	-	45	4	
2BD 060 300 45	0.6 X R0.3	2	3	45	4	
2BD 060 400 45	0.6 X R0.3	2	4	45	4	
2BD 060 500 45	0.6 X R0.3	2	5	45	4	
2BD 060 600 45	0.6 X R0.3	2	6	45	4	
2BD 060 800 45	0.6 X R0.3	2	8	45	4	
2BD 060 1000 45	0.6 X R0.3	2	10	45	4	
2BD 060 1200 45	0.6 X R0.3	2	12	45	4	
2BD 080 300 45	0.8 X R0.4	3	-	45	4	

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BD 080 400 45	0.8 X R0.4	3	4	45	4	
2BD 080 500 45	0.8 X R0.4	3	5	45	4	
2BD 080 600 45	0.8 X R0.4	3	6	45	4	
2BD 080 800 45	0.8 X R0.4	3	8	45	4	
2BD 080 1000 45	0.8 X R0.4	3	10	45	4	
2BD 080 1500 45	0.8 X R0.4	3	15	45	4	
2BD 080 2000 45	0.8 X R0.4	3	20	50	4	
2BD 100 300 60	1.0 X R0.5	3	-	60	4	
2BD 100 400 60	1.0 X R0.5	3	4	60	4	
2BD 100 500 60	1.0 X R0.5	3	5	60	4	
2BD 100 600 60	1.0 X R0.5	3	6	60	4	
2BD 100 800 60	1.0 X R0.5	3	8	60	4	
2BD 100 1000 60	1.0 X R0.5	3	10	60	4	
2BD 100 1200 60	1.0 X R0.5	3	12	60	4	
2BD 100 1500 60	1.0 X R0.5	3	15	60	4	
2BD 100 2000 60	1.0 X R0.5	3	20	60	4	
2BD 100 2500 60	1.0 X R0.5	3	25	80	4	
2BD 100 3000 60	1.0 X R0.5	3	30	80	4	
2BD 100 3500 60	1.0 X R0.5	3	35	80	4	
2BD 100 4000 60	1.0 X R0.5	3	40	80	4	
2BD 150 600 60	1.5 X R0.75	6	-	60	4	
2BD 150 800 60	1.5 X R0.75	6	8	60	4	
2BD 150 1000 60	1.5 X R0.75	6	10	60	4	
2BD 150 1200 60	1.5 X R0.75	6	12	60	4	
2BD 150 1500 60	1.5 X R0.75	6	15	60	4	
2BD 150 2000 60	1.5 X R0.75	6	20	60	4	
2BD 150 2500 80	1.5 X R0.75	6	25	80	4	
2BD 150 3000 80	1.5 X R0.75	6	30	80	4	
2BD 150 3500 80	1.5 X R0.75	6	35	80	4	
2BD 150 4000 80	1.5 X R0.75	6	40	80	4	
2BD 200 800 60	2.0 X R1.0	8	-	60	4	
2BD 200 1000 80	2.0 X R1.0	8	10	80	4	
2BD 200 1500 80	2.0 X R1.0	8	15	80	4	
2BD 200 2000 80	2.0 X R1.0	8	20	80	4	
2BD 200 2500 80	2.0 X R1.0	8	25	80	4	
2BD 200 3000 80	2.0 X R1.0	8	30	80	4	
2BD 200 3500 80	2.0 X R1.0	8	35	80	4	
2BD 200 4000 80	2.0 X R1.0	8	40	80	4	
2BD 200 4500 100	2.0 X R1.0	8	45	100	4	
2BD 200 5000 100	2.0 X R1.0	8	50	100	4	
2BD 200 6000 100	2.0 X R1.0	8	60	100	4	
2BD 300 2000 100	3.0 X R1.5	12	20	100	4	
2BD 300 2500 100	3.0 X R1.5	12	25	100	4	
2BD 300 3000 100	3.0 X R1.5	12	30	100	4	

2날 볼-다이아몬드 코팅
2F Ball End-Diamond Coated

2BD

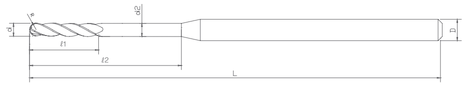
(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2BD 300 3500 100	3.0 X R1.5	12	35	100	4	
2BD 300 4000 100	3.0 X R1.5	12	40	100	4	
2BD 300 5000 100	3.0 X R1.5	12	50	100	4	
2BD 300 6000 100	3.0 X R1.5	12	60	100	4	
2BD 400 1600 60	4.0 X R2.0	16	-	60	4	
2BD 400 1600 80	4.0 X R2.0	16	-	80	4	
2BD 400 3000 80	4.0 X R2.0	16	30	80	4	
2BD 400 1600 100	4.0 X R2.0	16	-	100	4	
2BD 400 4000 100	4.0 X R2.0	16	40	100	4	
2BD 400 1600 130	4.0 X R2.0	16	-	130	4	
2BD 400 4000 130	4.0 X R2.0	16	40	130	4	
2BD 400 1600 150	4.0 X R2.0	16	-	150	4	
2BD 400 5000 150	4.0 X R2.0	16	50	150	4	
2BD 500 2000 105	5.0 X R2.5	16	20	105	6	
2BD 600 2500 80	6.0 X R3.0	25	-	80	6	
2BD 600 2500 105	6.0 X R3.0	25	-	105	6	
2BD 600 4000 105	6.0 X R3.0	25	40	105	6	
2BD 600 2500 150	6.0 X R3.0	25	-	150	6	
2BD 600 5000 150	6.0 X R3.0	25	50	150	6	
2BD 800 3000 80	8.0 X R4.0	30	-	80	8	
2BD 800 3000 105	8.0 X R4.0	30	-	105	8	
2BD 800 3500 150	8.0 X R4.0	35	-	150	8	
2BD 800 5000 150	8.0 X R4.0	35	50	150	8	
2BD 1000 3500 80	10.0 X R5.0	35	-	80	10	
2BD 1000 3500 105	10.0 X R5.0	35	-	105	10	
2BD 1000 5000 105	10.0 X R5.0	35	50	105	10	
2BD 1000 4000 150	10.0 X R5.0	40	-	150	10	
2BD 1000 5000 150	10.0 X R5.0	35	50	150	10	
2BD 1000 6000 150	10.0 X R5.0	35	60	150	10	
2BD 1200 5000 150	12.0 X R6.0	50	-	150	12	
2BD 1200 6000 200	12.0 X R6.0	60	-	200	12	

4날 볼-다이아몬드 코팅
4F Ball End-Diamond Coated

4BD

4 | HX30° | M/G Carbide | Diamond Coated



Features
- Used micrograin solid carbide excellent for high speed cutting
- Diamond coated for improved abrasion resistance and higher feed rates
- Greater rigidity and reduced chattering through optimized geometry

특징
- 초미립 초경 소재를 사용해 고속 가공성능이 우수함
- 고경도의 다이아몬드 코팅으로 내마모성이 커 고속가공이 가능함
- 최적의 설계로 날부의 강성이 크며 채터링 발생이 적음

Tolerance :

Cutting Dia.	Radius
d≤6: 0/-0.01 d>6: 0/-0.015	R≤0.25: 0/-0.005 R>0.25: 0/-0.01

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
									△	◎

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
4BD 100 300 60	1 X R0.5	3	-	60	4	
4BD 100 500 60	1 X R0.5	3	5	60	4	
4BD 100 1000 60	1 X R0.5	3	10	60	4	
4BD 100 1500 60	1 X R0.5	3	15	60	4	
4BD 100 2000 60	1 X R0.5	3	20	60	4	
4BD 100 2500 60	1 X R0.5	3	25	60	4	
4BD 150 450 60	1.5 X R0.75	4.5	-	60	4	
4BD 150 1000 60	1.5 X R0.75	4.5	10	60	4	
4BD 150 1500 60	1.5 X R0.75	4.5	15	60	4	
4BD 150 2000 60	1.5 X R0.75	4.5	20	60	4	
4BD 150 2500 60	1.5 X R0.75	4.5	25	60	4	
4BD 200 600 60	2 X R1	6	-	60	4	
4BD 200 1000 80	2 X R1	6	10	80	4	
4BD 200 2000 80	2 X R1	6	20	80	4	
4BD 200 3000 80	2 X R1	6	30	80	4	
4BD 200 4000 80	2 X R1	6	40	80	4	
4BD 300 800 60	3 X R1.5	8	-	60	4	
4BD 300 1500 100	3 X R1.5	8	15	100	4	
4BD 300 2000 100	3 X R1.5	8	20	100	4	
4BD 300 3000 100	3 X R1.5	8	30	100	4	
4BD 300 4000 100	3 X R1.5	8	40	100	4	
4BD 300 5000 100	3 X R1.5	8	50	100	4	
4BD 400 1600 60	4 X R2	16	-	60	4	

4날 볼-다이아몬드 코팅
4F Ball End-Diamond Coated

4BD

(Unit: mm)

제품 번호 Product No.	날경 X 볼반경 Cutting Dia. X Radius of Ball Nose (d X R)	날장 Length of Cut ℓ1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
4BD 400 1600 80	4 X R2	16	-	80	4	
4BD 400 1600 100	4 X R2	16	-	100	4	
4BD 400 1600 130	4 X R2	16	-	130	4	
4BD 600 2500 80	6 X R3	16	25	80	6	
4BD 600 2500 105	6 X R3	16	25	105	6	
4BD 600 3000 150	6 X R3	16	30	150	6	
4BD 800 3000 80	8 X R4	20	30	80	8	
4BD 800 3000 105	8 X R4	20	30	105	8	
4BD 800 3500 150	8 X R4	20	35	150	8	
4BD 800 4000 200	8 X R4	20	40	200	8	
4BD 1000 3500 80	10 X R5	22	35	80	10	
4BD 1000 3500 105	10 X R5	22	35	105	10	
4BD 1000 4000 160	10 X R5	22	40	160	10	
4BD 1000 5000 200	10 X R5	22	50	200	10	
4BD 1200 5000 105	12 X R6	25	50	105	12	
4BD 1200 5000 160	12 X R6	25	50	160	12	
4BD 1200 6000 200	12 X R6	25	60	200	12	

스타공구(주)
Star Tool Co., Ltd.

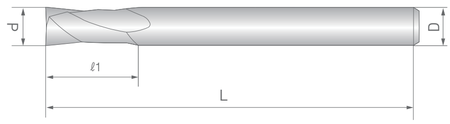
Special

SPEED-1

1날 엔드밀
1F End Mill

1FE

1 | HX30° | M/G Carbide | Uncoated



Features

- Made from micrograin solid carbide
- Flute geometry is designed for superior performance in aluminum and plastic milling applications

특징

- 초미립 초경 소재를 적용함
- 절삭날은 알루미늄과 플라스틱과 같은 비철 비금속 소재의 가공에서 최상의 성능을 내도록 설계됨

Tolerance :

Cutting Dia.
d≤5: 0/-0.02 d>5: 0/-0.003

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
△	△	△					△	◎	◎	

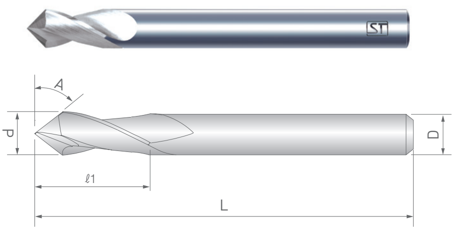
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
1FE 020 040	0.2	0.4	45	4	
1FE 050 150	0.5	1.5	45	4	
1FE 080 240	0.8	2.4	45	4	
1FE 100 300	1	3	50	6	
1FE 120 300	1.2	3	50	6	
1FE 150 400	1.5	4	50	6	
1FE 200 600	2	6	50	6	
1FE 250 600	2.5	6	50	6	
1FE 300 800	3	8	50	6	
1FE 400 1000	4	10	50	6	
1FE 600 1500	6	15	60	6	

2날 센터링
2F Centering

2CE

2 | HX30° | M/G Carbide | Uncoated



Features

- Made from micrograin solid carbide
- For centering and spot drilling applications
- 45 deg point angle

특징

- 초미립 초경 소재를 적용함
- 센터링과 스폿 드릴용
- 날각 45도

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

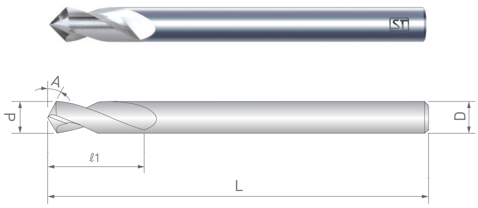
◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
△	△	△					△	○	◎	

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	각도 Angle A (°)	전장 Overall Length L	생크경 Shank Dia. D	비 고
2CE 300 600	3	6	45	50	3	
2CE 400 800	4	8	45	50	6	
2CE 600 1200	6	12	45	60	6	
2CE 800 1600	8	16	45	70	8	
2CE 1000 1800	10	18	45	70	10	
2CE 1200 2000	12	20	45	75	12	

2NCD



Features
- Made from micrograin solid carbide
- Drill & countersink with one tool

특징
- 초미립 초경 소재를 적용함
- 드릴링과 카운터 싱킹 가공용

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
△	△	△					△	○	◎	

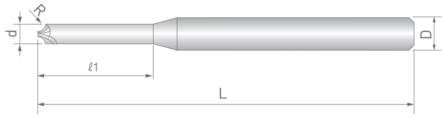
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	날장 Length of Cut ℓ1	각도 Angle A (°)	전장 Overall Length L	섕크경 Shank Dia. D	비 고
2NCD 300 1000	3	10	45	45	3	
2NCD 400 1200	4	12	45	50	4	
2NCD 600 1600	6	16	45	60	6	
2NCD 800 2400	8	24	45	80	8	
2NCD 1000 2600	10	26	45	80	10	
2NCD 1200 3000	12	30	45	80	12	

2날 역 R
2F Corner Rounding R

2CRR

2 M/G Carbide Uncoated



Features
- Made from micrograin solid carbide
- Designed with wide chip space

특징
- 초미립 초경 소재를 적용함
- 큰 칩 포켓 형상

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
△	△	△					△	○	◎	

(Unit: mm)

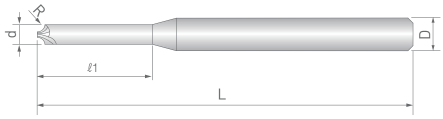
제품 번호 Product No.	R Radius R	d Dia. d	유효장 Length of Reach ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2CRR 020 100	0.2	1	2.5	45	4	
2CRR 030 120	0.3	1.2	2.5	45	4	
2CRR 050 160	0.5	1.6	2.5	45	4	
2CRR 075 300	0.75	3	5	45	4	
2CRR 100 300	1	3	5	50	6	
2CRR 150 450	1.5	4.5	8	50	6	
2CRR 200 550	1	5.5	10	50	6	
2CRR 300 800	3	8	10	60	8	
2CRR 400 1000	4	10	10	60	10	
2CRR 500 1200	5	12	10	70	12	

2날 역 R-C

2F Corner Rounding R-C

2CRRC

2 | M/G Carbide | AlTiN Coated



Features

- Made from micrograin solid carbide
- Designed with wide chip space

특징

- 초미립 초경 소재를 적용함
- 큰 칩 포켓 형상

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎		◎		◎		○	○	◎	◎	

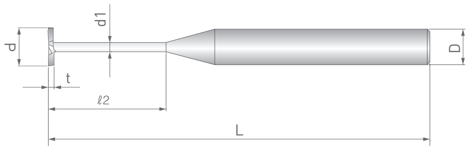
(Unit: mm)

제품 번호 Product No.	R Radius R	d Dia. d	유효장 Length of Reach ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
2CRRC 020 100	0.2	1	2.5	45	4	
2CRRC 030 120	0.3	1.2	2.5	45	4	
2CRRC 050 160	0.5	1.6	2.5	45	4	
2CRRC 075 300	0.75	3	5	45	4	
2CRRC 100 300	1	3	5	50	6	
2CRRC 150 450	1.5	4.5	8	50	6	
2CRRC 200 550	1	5.5	10	50	6	
2CRRC 300 800	3	8	10	60	8	
2CRRC 400 1000	4	10	10	60	10	
2CRRC 500 1200	5	12	10	70	12	

2날 T 커터
2F T Slot Cutter

2TC

2 | Helix 15° | M/G Carbide | Uncoated



Features
- Made from micrograin solid carbide
- High cutting edge rigidity with smaller spiral angle

특징
- 초미립 초경 소재를 적용함
- 작은 비틀림각을 적용하여 인선부의 강성이 큼

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

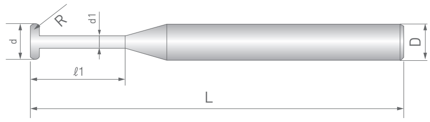
탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
△	△	△					△	○	◎	

(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	두께 Thickness t	목경 A Neck Dia. d1	유효장 Length of Reach ℓ2	전장 Overall Length L	생크경 Shank Dia. D	비 고
2TC 300 030	3	0.3	1.2	10	50	6	
2TC 300 050	3	0.5	1.2	10	50	6	
2TC 300 100	3	1	1.2	10	50	6	
2TC 400 030	4	0.3	1.5	10	50	6	
2TC 400 050	4	0.5	1.5	10	50	6	
2TC 400 100	4	1	1.5	10	50	6	
2TC 500 100	5	1	2	10	50	6	
2TC 600 050	6	0.5	2	15	54	6	
2TC 600 100	6	1	2	15	54	6	
2TC 600 150	6	1.5	2	15	54	6	
2TC 600 200	6	2	2	15	54	6	
2TC 800 100	8	1	3	15	60	8	
2TC 1000 100	10	1	4	15	60	10	
2TC 1000 200	10	2	4	15	60	10	
2TC 1200 200	12	2	4	15	70	12	
2TC 1200 300	12	3	4	15	70	12	

4날 라운드 T 커터
4F Round T Slot Cutter
4RTC

4 | Helix 15° | M/G Carbide | Uncoated



Features
- Made from micrograin solid carbide
- High cutting edge rigidity with smaller spiral angle

특징
- 초미립 초경 소재를 적용함
- 작은 비틀림각을 적용하여 인선부의 강성이 큼

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
△	△	△					△	○	◎	

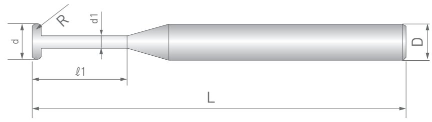
(Unit: mm)

제품 번호 Product No.	날경 Cutting Dia. d	R Radius R	목경 Neck Dia. d1	유효장 Length of Reach ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4RTC 600 050	6	0.5	3	6	54	6	
4RTC 600 075	6	0.75	3	6	54	6	
4RTC 600 100	6	1	3	6	54	6	
4RTC 800 100	8	1	4	8	60	8	
4RTC 800 150	8	1.5	4	8	60	8	
4RTC 1000 200	10	2	4.5	10	70	10	

4날 라운드 T 커터-C
4F Round T Slot Cutter-C

4RTCC

4 | Helix 15° | M/G Carbide | AlTiN Coated



Features

- Made from micrograin solid carbide
- High cutting edge rigidity with smaller spiral angle

특징

- 초미립 초경 소재를 적용함
- 작은 비틀림각을 적용하여 인선부의 강성이 큼

Tolerance :

Cutting Dia.
d≤6: 0/-0.01 d>6: 0/-0.015

Recommended workpiece Material :

◎: 최적(First choice), ○: 보통(Alternative choice), △: 제한적(Limited choice)

탄소강 / 합금강 (~HB 350) Carbon Steel / Alloy Steel / Tool Steel (up to 350 HB)	스테인리스 (~HB 240) Stainless Steel (up to 240 HB)	주철 (~HB 260) Cast Iron (up to 260 HB)	중저경도강 (~HRc 50) Prehardened Steel (up to 50 HRc)	고경도강 (HRc 45~55) Hardened Steel (45 to 55 HRc)	초고경도강 (HRc 55~68) Super Hardened Steel (55 to 68 HRc)	티타늄 합금 Titanium Alloy	동 합금 Copper Alloy	알루미늄 합금 Aluminum Alloy	수지 & 플라스틱 Resin & Plastics	흑연 Graphite
◎		◎		◎		○	○	◎	◎	

(Unit: mm)

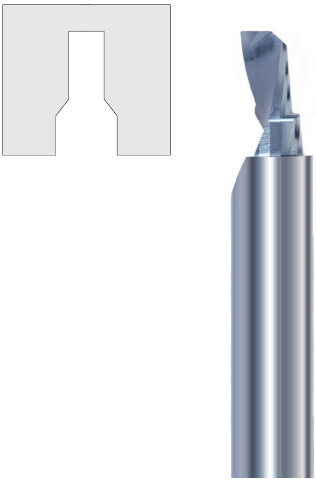
제품 번호 Product No.	날경 Cutting Dia. d1	R Radius R	목경 Neck Dia. d1	유효장 Length of Reach ℓ1	전장 Overall Length L	생크경 Shank Dia. D	비 고
4RTCC 600 050	6	0.5	3	6	54	6	
4RTCC 600 075	6	0.75	3	6	54	6	
4RTCC 600 100	6	1	3	6	54	6	
4RTCC 800 100	8	1	4	8	60	8	
4RTCC 800 150	8	1.5	4	8	60	8	
4RTCC 1000 200	10	2	4.5	10	70	10	

스타공구(주)
Star Tool Co., Ltd.

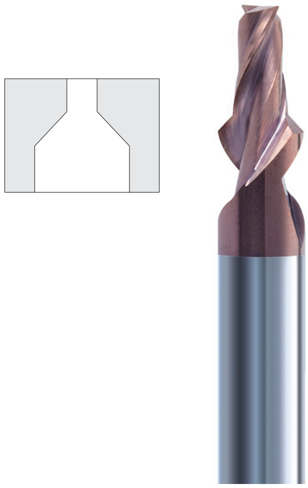
Specials-Custom Made

SPEED-1

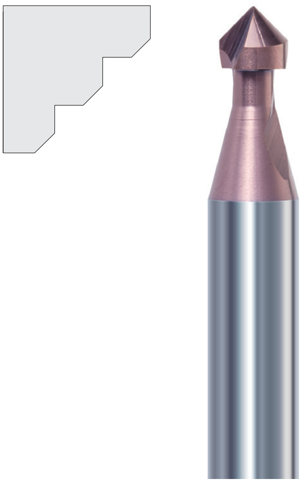
외날 스텝



테이퍼 스텝

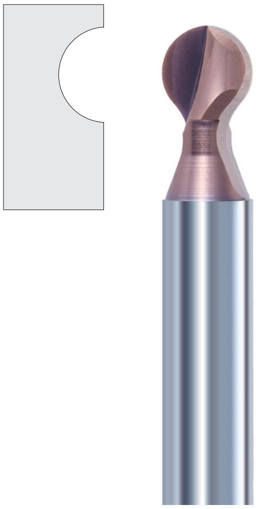


챔퍼툴

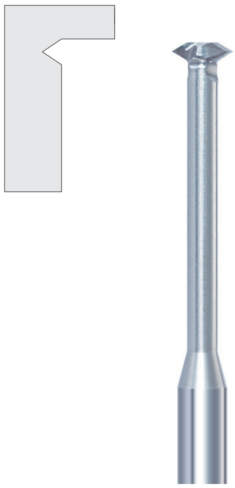


회전형 피치 가공툴

● 롤리 팝 볼



● 테이퍼 앵글 커터



● 여러날 T커터

● 면취용 버니싱

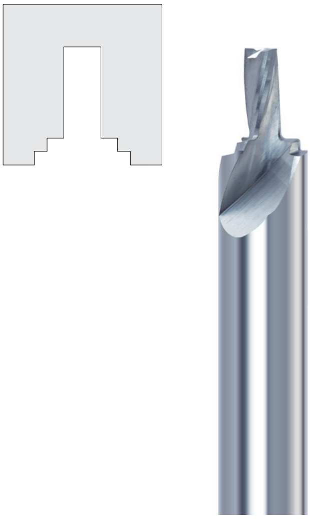
● 일자 게싱 프로파일

● 촛불형 3날 센터 볼

● 역R

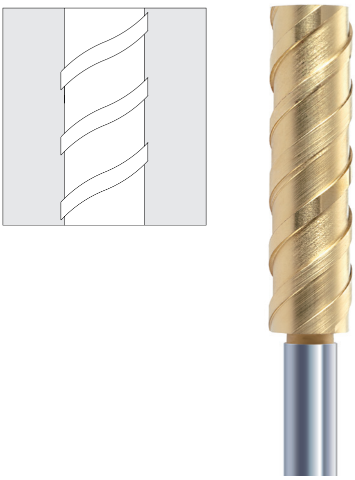
● 언더컷

● 다중스텝

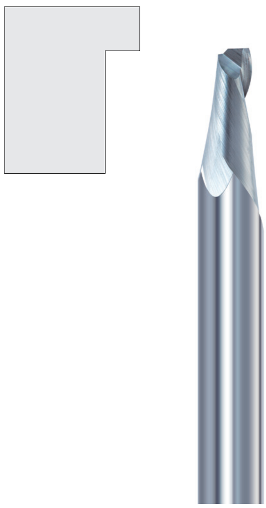


● R-T커터

● 스크류 금형

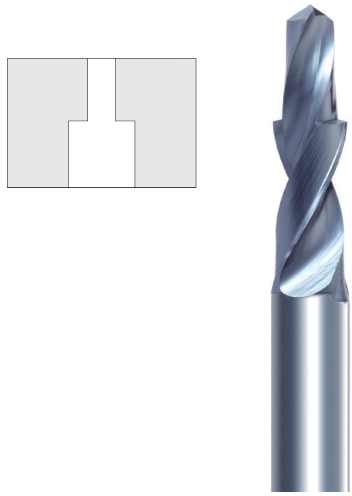


● 외날(좌날)



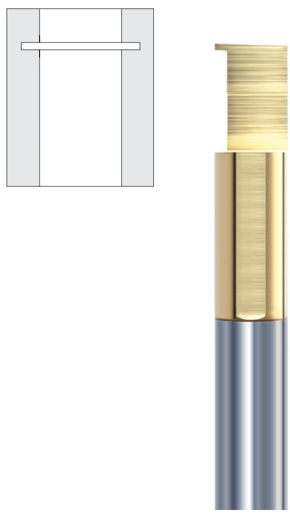
외날 테이퍼(비틀림 타입)

스텝



앵글 커터

내경 홈



● 형상 바이트

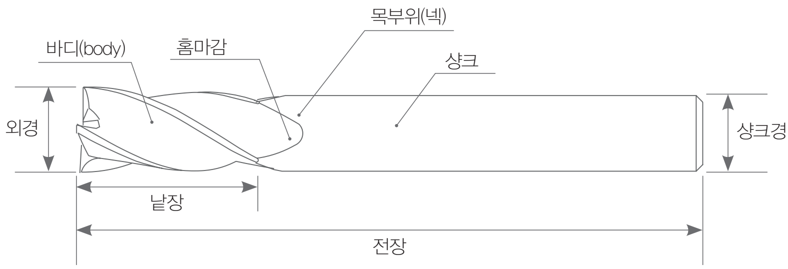
● 좌비틀 좌날 볼

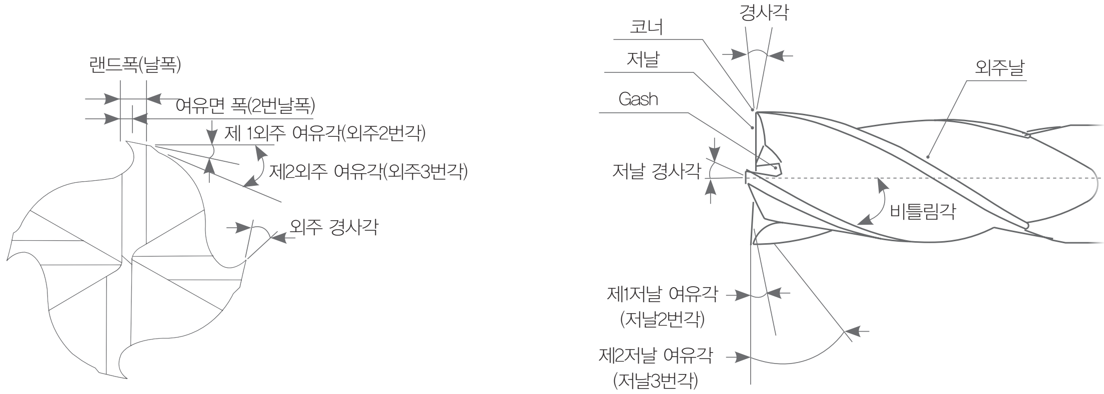
■ 엔드밀 가공의 트러블 대책

트러블 내용		요인 / 대책	공구재종의 선정	절삭조건									공구형상						기계장착					
			코팅제품으로 한다	절삭속도	이송	절입	피크피드(Pf)	절삭방향	에어블로어를 사용한다	절삭유제			비틀림각	날수	경사각	공구경	공구강성의 향상	칩포켓을 크게	공구돌출을 짧게 한다	공구체결정도의 향상	스핀들콜릿흔들림정도향상	콜렛의 점검교환	척보지력을 높인다	워크체결강성의 향상
				높인다 ↗ 낮춘다 ↘			↘ 작게			분사량을많게한다	비수용성으로한다	건식·습식의재검토	크게 ↗다 작게 ↘소											
수명 악화	외주날의 마모가 현저하다	비코팅품을 사용하고 있다	●																					
		날수가 적다												↗●										
		절삭조건의 부적정		●↘							●													
		업커터로 가공하고 있다						down Cut																
	칩핑이 많다	절산조건의 부적정																						
		인선강도가 약하다															●							
		척의 체결이 불충분																				●	●	
		체결강성이 낮다																	●	●	●	●	●	●
	가공중에 절손이 많다	절삭조건의 부적정				●↘																		
		엔드밀의 강성이 낮다														↗●	●							
		필요이상으로 돌출이 길다				●↘													●					
		칩이 막혀 있다								●								●						
정삭면 조도의 악화	가공중에 떨림이 발생한다	절삭조건의 부적정		●↘	●↘																			
		엔드밀의 강성이 낮다											↗●	↗●		↗●	●							
		체결강성이 낮다																	●	●	●	●	●	●
	벽면의 정삭면 조도가 나쁘다	절인의 마모가 크다	●																					
		절삭조건의 부적정		●↘		●↘																		
		칩이 물려든다							●	●		● 습식												
	저면의 정삭면 조도가 나쁘다	저날의 요철부 각도가 없다			●↘	●↘									↗●									
		피크피드가 크다					●↘																	
	벽면의 휨	절인의 마모가 크다	●																					
		절삭조건의 부적정			●↘	●↘																		
		엔드밀의 강성 부족											↗●	↗●		↗●	●							
	정삭치수 정도가 나쁘다	절삭조건의 부적정		●↘	●↘	●↘																		
		체결강성이 낮다																	●	●	●	●	●	●
버·가공물 마무리단계 결손	버·가공물 마무리단계 결손이 발생하고 있다	정삭조건의 부적정			●↘	●↘																		
		비틀림각이 크다											●↘											
	버 발생이 빠르다	경계마모가 발생하고 있다	●																					
		절삭조건의 부적정		●↘	↗●																			
칩처리	칩막힘이 발생하고 있다	가공량이 너무 크다			●↘	●↘																		
		칩포켓의 부족												●↘				●						

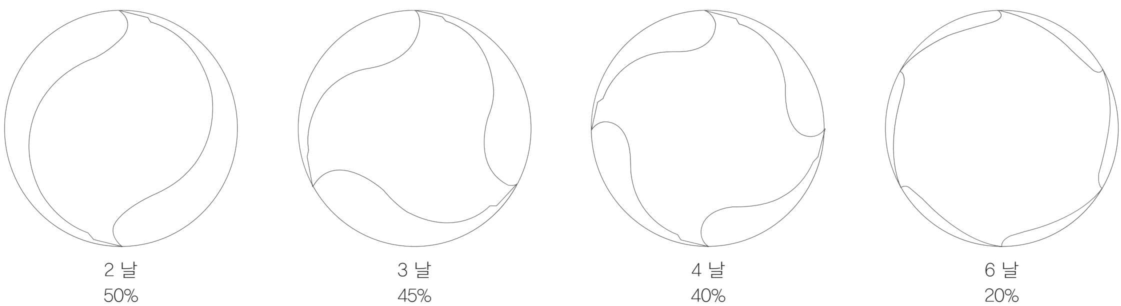
■ 엔드밀 각부 명칭 · 날수

▶ 엔드밀의 각 부 명칭





▶ 칩 포켓 단면적 비교



▶ 날 수에 따른 엔드밀의 특징과 용도

		2날	3날	4날	6날
특 징	장 점	칩배출성 양호 세로이송 가공 용이 절삭저항이 낮다	칩배출성 양호 세로이송 가공 용이	강성이 높다	강성이 높다 절인의 내구성이 우수하다
	단 점	강성이 낮다	외경 측정이 어렵다	칩배출성이 나쁘다	칩배출성이 나쁘다
용 도		홈, 측면가공 드릴가공 등 사용용도가 넓다	홈, 측면가공 중삭가공, 정삭가공	얕은 홈, 측면가공 정삭가공	고경도재 가공 얕은 홈, 측면가공

스타공구(주)
Star Tool Co., Ltd.

절삭조건표

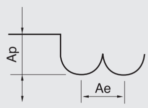
Speed and Feed Recommendations

SPEED-1

Feed: mm / min

피삭재 Material		동 Copper				고경도강/프리하든강 Prehardendd Steels / Hardened Steels				고경도강 Hardened Steels			
						NAK/SKD				SKD/SKT			
경도 Hardness						30 ~ 45HRc				45 ~ 55HRc			
반경 Radius	유효장 Length of Reach	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth
R0.1	1.5	42,000	300	0.006	0.006	42,000	230	0.003	0.004	42,000	180	0.003	0.004
R0.15	5	33,000	280	0.001	0.005	24,000	180	0.003	0.003	20,000	140	0.003	0.003
R0.2	5	33,000	390	0.008	0.016	25,000	310	0.008	0.01	22,000	240	0.006	0.01
R0.25	10	32,000	440	0.008	0.016	24,000	380	0.007	0.01	24,000	310	0.005	0.01
R0.3	10	26,000	450	0.006	0.032	20,000	300	0.005	0.02	19,000	260	0.004	0.02
R0.4	10	19,000	560	0.022	0.08	24,000	390	0.02	0.05	16,000	340	0.015	0.05
R0.5	10	25,000	970	0.024	0.086	13,600	500	0.02	0.0556	12,500	380	0.014	0.056
R0.75	18	10,100	520	0.03	0.16	10,100	420	0.022	0.11	8,000	360	0.02	0.11
R1.0	20	13,300	970	0.009	0.165	13,300	500	0.06	0.11	10,600	500	0.055	0.11
R1.5	20	11,700	1,870	0.2	0.45	10,300	1,230	0.145	0.32	7,100	940	0.12	0.31
R2.0	30	9,300	1,700	0.25	0.5	7,400	1,150	0.2	0.32	5,500	880	0.15	0.3
R2.5	25	9,000	2,000	0.38	0.8	7,000	1,150	0.3	0.55	5,000	900	0.22	0.55
R3.0	30	7,000	1,510	0.38	0.9	6,000	1,400	0.3	0.65	4,200	990	0.22	0.65
R4.0	30	6,400	1,400	0.38	1	5,800	940	0.3	0.75	4,000	720	0.16	0.6
R5.0	35	5,000	1,080	0.5	1	4,500	900	0.35	0.85	3,800	680	0.15	0.6
R6.0	40	4,100	900	0.6	1.2	3,800	8,000	0.4	0.85	3,400	650	0.2	0.003

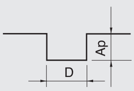
절입량 Depth of Cut



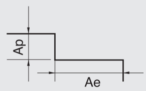
피삭재 Material		탄소강 Carbon Steels			합금강/공구강 Alloy Steels SK/SCM/SUS			고경도강/프리하든강 Hardened Steels/Prehardened Steels NAK/SKD			고경도강 Hardened Steels SKD/SKT		
경도 Hardness		(S45C/S50C)~225HB			225 ~ 325HB			35 ~ 45HRc			45 ~ 55HRc		
외경 Outer Diameter	유효장 Length of Reach	RPM	Feed (mm/min)	Ap Axial	RPM	Feed (mm/min)	Ap Axial	RPM	Feed (mm/min)	Ap Axial	RPM	Feed (mm/min)	Ae Radial Depth
0.2	1.5	45,200	220	0.003	45,200	210	0.003	45,200	180	0.002	35,500	120	0.002
0.3	3	29,800	210	0.002	29,800	200	0.002	29,800	170	0.001	22,500	110	0.001
0.4	5	36,500	350	0.003	31,200	280	0.003	28,100	220	0.002	21,100	140	0.001
0.5	6	30,400	400	0.005	26,500	300	0.005	20,700	220	0.004	17,700	150	0.002
0.8	8	21,100	490	0.011	17,300	370	0.01	15,200	270	0.008	10,800	180	0.005
1.0	10	17,200	500	0.012	14,200	370	0.01	11,800	280	0.008	10,000	190	0.006
1.5	10	14,600	650	0.04	12,800	500	0.03	10,200	350	0.025	7,800	250	0.02
2.0	20	8,700	450	0.025	7,500	360	0.022	6,000	260	0.015	5,000	170	0.012
2.5	30	6,000	420	0.018	5,300	300	0.015	4,500	230	0.012	3,700	150	0.008
3.0	30	5,900	500	0.035	4,800	370	0.03	4,200	270	0.02	3,200	180	0.015
4.0	20	5,800	800	0.1	4,800	600	0.8	3,500	400	0.065	290	280	0.05
5.0	30	4,100	610	0.12	3,200	480	0.1	2,400	320	0.07	1,800	200	0.06
6.0	40	2,800	570	0.11	2,100	390	0.1	1,600	240	0.07	1,200	150	0.05
8.0	40	2,600	600	0.12	2,000	410	0.1	1,500	250	0.8	1,100	160	0.06

절입량 Depth of Cut

Slotting
- Ap : Axial Depth
- D : Outside Diameter



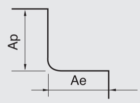
Side Milling
- Ap : Axial Depth
- Ae : Radial Depth



피삭재 Material		동 Copper				고경도강/프리하든강 Prehardendd Steels / Hardened Steels NAK/SKD				고경도강 Hardened Steels SKD/SKT			
경도 Hardness						30 ~ 45HRc				45 ~ 55HRc			
외경 Outer Diameter	유효장 Length of Reach	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth
0.8	8	11,000	260	0.026	0.085	11,000	230	0.004	0.077	9,300	160	0.003	0.077
1.0	10	7,500	330	0.041	0.268	7,500	270	0.009	0.107	6,500	230	0.011	0.107
1.5	10	7,200	760	0.128	0.482	7,200	640	0.027	0.245	6,600	550	0.036	0.245
2.0	12	8,000	830	0.158	0.612	8,000	700	0.026	0.383	7,200	630	0.037	0.383
3.0	12	9,000	1,360	0.332	0.723	9,000	980	0.089	0.536	8,500	760	0.089	0.57
4.0	20	5,900	1,000	0.326	1.152	5,900	850	0.046	0.765	5,000	730	0.068	0.765
6.0	20	5,200	1,200	0.522	1.908	5,200	1,060	0.414	1.179	3,100	900	0.162	1.179
8.0	22	4,800	1,100	0.459	2.21	4,800	940	0.364	1.32	2,800	790	0.143	1.32
10.0	24	4,000	900	0.39	2.51	3,900	800	0.31	1.43	2,400	670	0.121	1.43
12.0	26	3,300	760	0.328	2.62	3,300	670	0.26	1.76	2,000	560	0.102	1.76

측면절삭
Milling amount of side milling

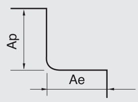
- Ap : Axial Depth
- Ae : Radial Depth

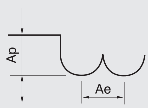


피삭재 Material		고경도강/프리하든강 Hardened Steels/Prehardened Steels NAK/SKD				고경도강 Hardened Steels SKD/SKT			
경도 Hardness		30 ~ 45HRc				45 ~ 55HRc			
외경 Outer Diameter	유효장 Length of Reach	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth
1.0	4	11,700	1,100	0.033	0.23	10,200	910	0.026	0.207
1.5	6	9,900	1,100	0.035	0.413	9,000	1,000	0.032	0.378
2.0	12	7,800	880	0.039	0.344	7,200	820	0.037	0.344
2.5	20	6,600	1,000	0.041	0.23	6,400	570	0.026	0.191
3.0	20	7,100	1,300	0.049	0.493	6,700	1,300	0.031	0.493
4.0	20	6,200	1,200	0.06	0.8	5,200	1,120	0.047	0.8
6.0	20	4,900	1,470	0.153	2.004	2,900	850	0.153	1.114
8.0	22	4,000	1,600	0.184	2.54	2,400	680	0.184	1.32
10.0	24	3,200	1,750	0.21	2.73	1,900	540	0.22	1.43
12.0	26	2,500	1,800	0.23	2.7	1,500	430	0.24	1.49

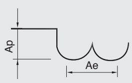
측면절삭 Milling amount of side milling

- Ap : Axial Depth
- Ae : Radial Depth

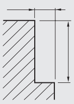
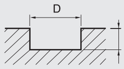
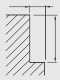
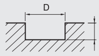


피삭재 Material		동 Copper				고경도강/프리하든강 Prehardendd Steels / Hardened Steels NAK/SKD				고경도강 Hardened Steels SKD/SKT			
경도 Hardness						30 ~ 45HRc				45 ~ 55HRc			
반경 Radius	날장 Cutting Length	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth
R0.15	0.6	50,000	680	0.01	0.01	50,000	620	0.065	0.022	41,300	530	0.045	0.02
R0.25	0.5	52,000	1,050	0.017	0.03	49,000	1,050	0.14	0.045	40,800	900	0.11	0.035
R0.5	1	32,800	1,300	0.032	0.05	36,000	1,200	0.24	0.08	29,500	1,000	0.192	0.064
R0.75	1.5	21,600	1,500	0.054	0.07	28,000	1,280	0.36	0.12	23,000	1,024	0.288	0.096
R1.0	2	16,000	1,500	0.071	0.09	24,000	1,480	0.48	0.16	20,000	1,184	0.36	0.128
R1.5	3	10,400	1,800	0.137	0.158	20,400	2,010	0.766	0.24	16,800	1,640	0.613	0.192
R2.0	4	8,000	1,700	0.166	0.213	16,800	1,960	0.88	0.32	14,000	1,560	0.88	0.256
R3.0	6	5,500	1,500	0.225	0.232	12,800	2,160	1.872	0.48	10,400	1,720	1.496	0.384
R4.0	8	4,500	800	0.14	0.32	10,000	1,840	2.48	0.65	8,200	1,400	1.984	0.512
R5.0	10	2,600	560	0.123	0.4	8,400	1,760	3	0.8	6,900	1,400	2.4	0.64
R6.0	22	3,000	480	0.127	0.48	7,200	1,400	3.53	0.96	5,900	1,180	2.224	0.768
절입량 Depth of Cut													

- 홈가공의 경우, 상기표 Feed 값을 반으로 하십시오.
- For slotting, set the feed rate in half.

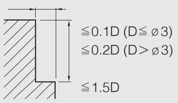
피삭재 Material		동/탄소강 Copper/Carbon Steels			고경도강/프리하든강 Hardened Steels/ Prehardened Steels			고경도강 Hardened Steels			고경도강 Hardened Steels		
경도 Hardness		30 ~ 45 HRc			30 ~ 45 HRc			45 ~ 55 HRc			55 ~ 65 HRc		
반경	유효장 Length of Reach	RPM	Feed (mm/min)	Ap Axial Depth	RPM	Feed (mm/min)	Ap Axial Depth	RPM	Feed (mm/min)	Ap Axial Depth	RPM	Feed (mm/min)	Ap Axial Depth
R1.0	25	9,000	1,200	0.045	7,000	800	0.035	7,000	780	0.03	7,000	640	0.025
R1.0	37	9,000	1,200	0.035	6,700	780	0.03	6,000	700	0.025	6,000	580	0.02
R1.25	25	9,000	1,400	0.045	6,900	850	0.045	6,000	850	0.04	6,000	680	0.03
R1.25	37	9,000	1,400	0.04	6,900	830	0.04	6,000	800	0.035	6,000	650	0.025
R1.5	25	9,000	1,800	0.075	7,000	1,050	0.06	6,000	1,000	0.05	6,000	880	0.042
R1.5	37	7,500	1,400	0.06	5,000	880	0.05	5,100	800	0.04	5,100	700	0.035
R1.5	30	9,000	1,800	0.075	7,000	1,050	0.06	6,000	1,000	0.05	6,000	880	0.042
R1.5	40	7,500	1,400	0.06	5,000	880	0.05	5,100	800	0.04	5,100	700	0.035
R2.0	45	6,000	1,200	0.078	3,500	580	0.06	3,200	510	0.045	3,200	450	0.04
Milling Amount	Roughing	Ae≤0.1D			Ae≤0.1D			Ae≤0.08D			Ae≤0.06D		
	Finishing	Ae = Vf/N											
절입량 Depth of Cut													

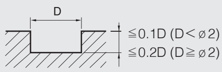
- AP: Axial Depth
- Ae : Radial Depth
- D : Outside Diameter
- n : Speed
- Vf : Feed

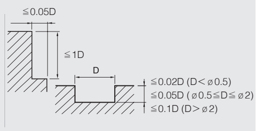
피삭재 Material	탄소강/합금강 Carbon Steels/Alloy Steels S45C/S50C/SK/SCM		고경도강/프리하든강 Hardened Steels/Prehardened Steels SKT / SKD / NAK55 / HPM1		스테인레스강 Stainless Steels SUS304/SUS316		고경도강 Hardened Steels SKD11/SKD61/SKT	
경도 Hardness	~30HRc		30 ~ 45HB				45 ~ 55HRc	
외경 Outer Diameter	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
0.3	40,000	140	40,000	130	40,000	130	40,000	80
0.5	40,000	300	40,000	280	30,000	220	40,000	100
1.0	28,000	550	18,000	350	14,000	28	30,000	140
2.0	14,000	850	90,00	550	7,000	420	14,000	140
3.0	8,000	200	5,000	130	4,200	110	7,200	55
4.0	7,000	290	4,000	180	3,400	110	3,000	60
5.0	5,600	300	3,200	180	2,400	110	2,500	65
6.0	4,900	340	2,900	190	2,200	130	2,200	80
8.0	3,600	360	2,200	190	1,600	130	1,800	95
10.0	2,800	310	1,700	150	1,300	110	1,300	80
12.0	2,400	260	1,400	130	1,000	90	1,200	70
절입량 Depth of Cut	≦0.1D (D≦ ø3) ≦0.2D (D> ø3)  ≦1.5D		 D ≦0.1D (D< ø2) ≦0.3D (ø2≦D≦ ø3) ≦0.5D (D> ø3)				≦0.05D  ≦1D	 D ≦0.05D

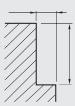
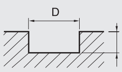
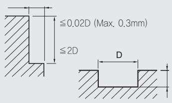
피삭재 Material	탄소강/합금강 Carbon Steels/Alloy Steels S50/SCM		합금강/공구강/프리하든강 Alloy Steels/Tool Steels /Prehardened Steels SKD/NAK		스테인레스강 Stainless Steels SUS304/SUS316		고경도강 Hardened Steels	
경도 Hardness	~30HRc		30 ~ 45HRc				45 ~ 55HRc	
외경 Outer Diameter	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
0.8	30,600	430	22,500	310	20,700	230	17,100	110
1.0	27,000	540	18,000	360	16,200	270	13,500	110
1.5	18,000	540	12,600	360	10,800	270	9,000	110
2.0	13,500	540	9,000	360	8,200	270	7,200	110
3.0	9,000	540	6,300	360	5,400	270	4,500	110
4.0	6,800	540	4,700	360	4,100	270	3,600	110
5.0	5,400	540	3,800	360	3,200	270	2,900	110
6.0	4,500	540	3,200	360	2,700	270	2,400	110
8.0	3,600	470	2,500	320	2,200	230	1,800	110
10.0	2,900	410	2,000	270	1,700	210	1,400	90
12.0	2,400	370	1,700	240	1,400	190	1,200	90

절입량 Depth of Cut







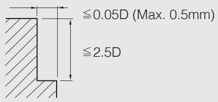
피삭재 Material	탄소강/합금강		고경도강/프리하든강		스테인레스강		고경도강	
	Carbon Steels/Alloy Steels		Hardened Steels /Prehardened Steels		Stainless Steels		Hardened Steels	
	S45C/S50C/SK/SCM		NAK/SKD		SUS304/SUS316			
경도 Hardness	~30HRc		30 ~ 45HRc				45 ~ 55HRc	
외경 Outer Diameter	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
1.0	13,000	230	7,500	140	7,200	100	5,500	50
1.5	11,000	240	7,000	150	6,000	110	5,000	55
2.0	10,000	250	6,800	160	5,800	120	4,500	60
3.0	7,500	270	4,900	180	4,000	150	3,000	75
4.0	6,800	500	4,000	300	3,400	250	2,500	100
5.0	5,600	540	3,200	320	2,800	270	2,000	110
6.0	5,000	580	3,000	320	2,500	290	1,800	120
8.0	3,700	650	2,100	320	1,800	300	1,400	150
10.0	2,800	540	1,700	260	1,400	270	1,200	130
12.0	2,700	470	1,400	220	1,200	210	1,000	120
절입량 Depth of Cut	 ≦0.05D (Max. 0.5mm) ≦2.5D		 D ≦0.05D (D=ø1) ≦0.1D (ø1<D≦ø2) ≦0.15D (ø2<D≦ø3) ≦0.3D (D>ø3) (Max. 0.5mm)				 ≦0.02D (Max. 0.3mm) ≦2D D ≦0.05D (Max. 3mm)	

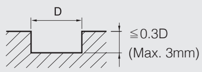
• 홈가공의 경우, 상기표 Feed 값을 반으로 하십시오. 또한 스테인레스강 홈가공의 경우에, 회전속도는 상기표의 60%, 이송속도는 40% 기준입니다.

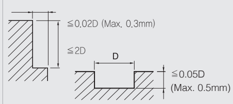
• For slotting, set the feed rate in half. In case of slotting for stainless steel, set 60% of RPM and 40% of the feed rate in the table above.

피삭재 Material	탄소강/합금강 Carbon Steels S50/SCM		합금강/공구강/프리하든강 Alloy Steels/Tool Steels /Prehardened Steels SKD/NAK		스테인레스강 Stainless Steels SUS304/SUS316		고경도강 Hardened Steels SKD61	
경도 Hardness	~30HRc		30 ~ 45HRc				45 ~ 55HRc	
외경 Outer Diameter	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
2.0	4,200	80	3,600	70	2,900	50	2,200	35
3.0	3,600	90	2,900	80	2,200	60	1,800	40
4.0	2,900	120	2,300	90	1,800	70	1,400	50
5.0	2,500	150	2,000	120	1,500	90	1,300	60
6.0	2,100	170	1,700	150	1,300	110	1,100	70
8.0	1,600	190	1,300	150	1,000	130	900	70
10.0	1,400	150	1,100	150	800	110	700	70
12.0	1,100	120	900	120	700	90	570	60

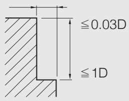
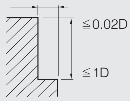
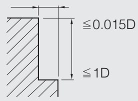
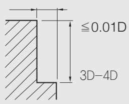
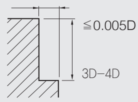
절입량
Depth of Cut





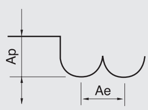


• 스테인레스강 홈가공의 경우에, 회전속도는 상기표의 60%, 이송속도는 40% 기준입니다.
• In case of slotting for stainless steel, set 60% of RPM and 40% of the feed rate in the table above.

피삭재 Material		합금강 Alloy Stells		고경도강 Hardened Steels			
경도 Hardness		~ 45HRc		45 ~ 55HRc		55 ~ 62HRc	
외경 Outer Diameter (mm)	날장 Length of Cut (mm)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
6	15	3,200	820	2,600	600	2,200	540
	25	1,700	360	1,300	260	1,100	190
8	25	2,200	730	1,800	500	1,600	480
	35	1,200	310	900	230	700	160
10	35	1,800	660	1,500	450	1,300	380
	45	1,000	330	800	230	700	180
12	40	1,400	640	1,200	450	1,000	420
	50	650	250	500	170	400	130
절입량 Depth of Cut	Short Type						
	Long Type						

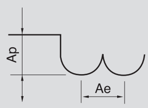
피삭재 Material		고경도강/프리하든강 Prehardened Steels/Hardened Steels NAK / STAVAX				고경도강 Hardened Steels SKD11				고경도강 Hardened Steels HAP10				고경도강 Hardened Steels HAP72			
경도 Hardness		~55HRc				55 ~ 62HRc				62 ~ 66HRc				66 ~ 70HRc			
반경 Radius	유효장 Length of Reach	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)"	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)"	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)"	Ap Axial Depth	Ae Radial Depth
R0.5	2	30,000	1,600	0.2	0.4	24,000	1,800	0.1	0.3	21,000	1,600	0.05	0.2	16,000	800	0.05	0.2
R0.5	5	30,000	1,600	0.01	0.3	24,000	1,800	0.05	0.2	21,000	1,600	0.03	0.17	16,000	800	0.03	0.17
R0.5	10	14,800	320	0.018	0.13	14,800	400	0.01	0.09	14,700	320	0.01	0.09	11,100	160	0.01	0.09
R0.75	3	30,000	2,450	0.25	0.55	17,000	1,800	0.12	0.4	15,000	1,600	0.06	0.29	11,250	850	0.06	0.29
R0.75	10	23,500	1,200	0.1	0.35	15,000	1,100	0.045	0.25	14,000	1,000	0.03	0.21	10,500	500	0.03	0.21
R1	4	28,000	2,700	0.3	0.7	14,000	2,000	0.15	0.5	12,250	1,800	0.08	0.35	9,200	800	0.08	0.35
R1	10	28,000	2,700	0.2	0.6	14,000	2,000	0.1	0.4	12,250	1,800	0.06	0.3	9,200	800	0.06	0.3
R1	20	8,650	360	0.035	0.25	8,650	450	0.02	0.19	8,560	340	0.02	0.19	6,400	170	0.02	0.19
R1.5	6	21,000	2,800	0.4	1	10,500	2,000	0.2	0.7	9,200	1,700	0.12	0.55	6,900	900	0.12	0.55
R1.5	10	21,000	2,800	0.3	0.9	10,500	2,000	0.15	0.65	9,200	1,700	0.1	0.5	6,900	900	0.1	0.5
R1.5	20	14,500	1,300	0.18	0.7	9,250	1,300	0.1	0.5	8,400	1,050	0.75	0.45	6,450	500	0.075	0.45
R2	8	18,000	3,000	0.5	1.3	9,000	2,100	0.25	0.95	7,900	1,800	0.15	0.75	5,900	900	0.15	0.75
R2	20	18,000	3,000	0.4	1.2	9,000	2,100	0.2	0.85	7,900	1,800	0.13	0.7	5,900	900	0.13	0.7
R2	30	7,000	500	0.1	0.6	7,000	600	0.06	0.45	7,000	500	0.06	0.45	5,250	240	0.06	0.45
R3	15	13,000	3,500	0.6	1.8	6,500	2,500	0.3	1.3	5,700	2,200	0.2	1	4,300	1,100	0.2	1
R4	25	9,500	2,800	0.7	2.1	5,200	2,100	0.4	1.7	4,500	1,800	0.25	1.35	3,400	900	0.25	1.35
R5	30	7,500	2,300	0.8	2.5	4,300	2,800	0.5	2.1	3,750	1,600	0.3	1.7	2,800	850	0.3	1.7
R6	30	6,200	1,800	0.9	3	3,600	1,600	0.6	2.6	3,150	1,400	0.35	2	2,350	680	0.35	2

절입량
Depth of Cut



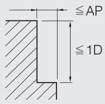
피삭재 Material	고경도강/프리하든강 Prehardened Steels/Hardened Steels NAK / STAVAX				고경도강 Hardened Steels SKD11				고경도강 Hardened Steels HAP10				고경도강 Hardened Steels HAP72			
경도 Hardness	~55HRc				55 ~ 62HRc				62 ~ 66HRc				66 ~ 70HRc			
반경 Radius	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth
R0.1	60,000	180	0.003	0.005	60,000	180	0.002	0.003	60,000	120	0.002	0.003	45,000	60	0.002	0.003
R0.15	60,000	330	0.006	0.008	45,000	300	0.004	0.007	43,500	160	0.003	0.003	32,500	80	0.003	0.005
R0.2	50,000	480	0.01	0.02	37,500	400	0.007	0.012	35,000	220	0.005	0.008	26,250	110	0.005	0.008
R0.25	44,000	630	0.015	0.04	33,000	520	0.01	0.02	30,000	280	0.007	0.01	22,500	140	0.007	0.01
R0.3	40,000	1,000	0.03	0.13	30,000	1,100	0.02	0.1	26,500	700	0.01	0.075	20,000	380	0.01	0.075
R0.4	35,000	1,500	0.06	0.21	27,000	1,500	0.04	0.17	23,500	950	0.02	0.12	17,500	480	0.02	0.12
R0.5	30,000	1,600	0.2	0.4	24,000	1,800	0.1	0.3	21,000	1600	0.05	0.2	16,000	800	0.05	0.2
R0.75	30,000	2,400	0.25	0.55	17,000	1,800	0.12	0.4	15,000	1,600	0.06	0.29	11,250	850	0.06	0.29
R1.4	28,000	2,700	0.3	0.7	14,000	2,000	0.15	0.5	12,250	1,800	0.08	0.35	9,200	800	0.08	0.35
R1.25	21,000	2,800	0.4	1	10,500	2,000	0.2	0.7	9,200	1,700	0.12	0.55	6,900	900	0.12	0.55
R2	18,000	3,000	0.5	1.3	9,000	2,100	0.25	0.95	7,900	1,800	0.15	0.75	5,900	900	0.15	0.75
R2.5	15,600	3,000	0.5	1.5	7,800	2,100	0.25	1.05	6,800	1,900	0.16	0.88	5,100	900	0.15	0.088
R3	13,000	3,300	0.6	1.8	6,500	2,300	0.3	0.3	5,700	2,000	0.2	1	4,300	1,000	0.2	1
R4	9,500	2,800	0.7	2.1	5,200	2,100	0.4	0.7	4,500	1,800	0.25	1.35	3,400	900	0.25	1.35
R5	7,500	2,300	0.8	2.5	4,300	2,800	0.5	2.1	3,750	1,600	0.3	1.7	2,800	850	0.3	1.7
R6	6,200	1,800	0.9	3	3,600	1,600	0.6	2.6	3,150	1,400	0.35	2	2,350	680	0.35	2

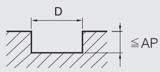
절입량 Depth of Cut



피삭재 Material	고경도강/프리하든강 Prehardened Steels/Hardened Steels			고경도강 Hardened Steels					
경도 Hardness	30 ~ 45 HRc			30 ~ 45 HRc			55 ~ 62 HRc		
외경 Outer Dia.	RPM	Feed (mm/min)	Ap Axial Depth	RPM	Feed (mm/min)"	Ap Axial Depth	RPM	Feed (mm/min)"	Ap Axial Depth
1mm	40,000	2,800	0.06	32,000	22,000	0.06	16,000	680	0.05
1.5mm	40,000	4,300	0.12	32,000	3,300	0.08	10,600	600	0.08
2mm	30,000	4,300	0.18	24,000	3,300	0.10	8,100	480	0.10
3mm	20,000	3,300	0.30	16,000	2,500	0.15	5,400	360	0.15
4mm	15,000	2,800	0.40	12,000	2,200	0.20	4,000	430	0.20
6mm	10,000	1,900	0.60	7,000	1,200	0.30	2,700	300	0.20
8mm	8,000	1,300	0.80	5,600	1,000	0.40	2,000	220	0.20
10mm	6,400	1,200	1.00	4.500	900	0.50	1,600	190	0.30
12mm	6,400	1,000	1.00	3,800	800	0.50	1,300	150	0.30

절입량 Depth of Cut





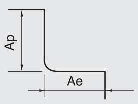
사이드밀링기준임. The above data are based on side milling.

4날 코너 R–고경도용 4F Corner Radius for Hardened Steels 4CLH

피삭재 Material		고경도강/프리하든강 Prehardened Steels/Hardened Steels NAK/SKD				고경도강 Hardened Steels SKD/SKT				고경도강 Hardened Steels SKD/SKT			
경도 Hardness		30 ~ 45HRc				45 ~ 55HRc				55 ~ 65HRc			
외경 Outer Diameter	유효장 Length of Reach	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth	RPM	Feed (mm/min)	Ap Axial Depth	Ae Radial Depth
3	10	11,500	1,800	0.082	0.595	10,700	1,800	0.051	0.595	9,100	620	0.038	0.476
4	12	9,500	1,370	0.091	1	7,900	1,330	0.071	1	9,400	740	0.043	0.7
6	15	6,000	1,470	0.153	2.004	3,500	850	0.153	1.114	3,000	650	0.06	1.114
8	20	4,800	1,600	0.184	2.54	2,900	680	0.184	1.32	2,400	650	0.087	1.32
10	25	3,840	1,750	0.21	2.73	2,300	540	0.22	1.43	1,900	460	0.094	1.45
12	26	3,000	1,800	0.23	2.7	1,800	430	0.24	1.49	1,600	450	0.11	1.5

절입량 Depth of Cut

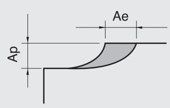
- AP : Axial Depth
- Ae : Radial Depth

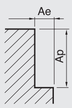


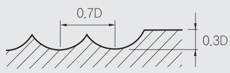
4날 코너 R–고이송용 4F Corner Radius for High Feed Rate 4CF

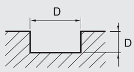
피삭재 Material	탄소강/합금강 Carbon Steels/Alloy Steels S50C/SCM				합금강/프리하든강 Alloy Steels/Prehardened Steels SKD61/SKD11/NAK				고경도강 Hardened Steels SKD61/STAVAX			
경도 Hardness	~30HRc				30 ~ 45HRc				45 ~ 55HRc			
외경 Outer Diameter	RPM	Feed (mm/min)	Ae(mm)	Ap(mm)	RPM	Feed (mm/min)	Ae(mm)	Ap(mm)	RPM	Feed (mm/min)	Ae(mm)	Ap(mm)
6.0	11,000	13,000	2.5	0.25	9,000	11,000	2	0.15	8,000	9,600	2.5	0.1
8.0	8,200	13,000	3	0.3	7,000	11,000	3	0.2	6,000	9,600	3	0.15
10.0	6,500	13,000	4.5	0.3	5,500	11,000	4.5	0.2	4,800	9,500	4.5	0.15
12.0	5,500	12,000	5.5	0.3	5,000	10,000	5.5	0.2	4,100	9,000	4.5	0.25

절입량 Depth of Cut



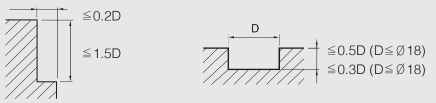
피삭재 Material	알루미늄 합금재 Aluminum Alloys Expanding Material A7075				알루미늄 합금재 Aluminum Alloys Casting <Si 13%				알루미늄 합금/동 Aluminum Alloys Steels / Copper AZ91/AZ80A/C1100			
	일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling		일반가공 Regular Milling		고속가공 High Speed Milling	
외경 Outer Diamete	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
2.0	20,600	800	37,000	1,400	20,600	800	24,000	800	9,600	230	15,200	340
3.0	16,800	900	32,000	1,700	16,800	900	19,200	1,000	6,400	260	13,600	500
4.0	12,400	1,000	25,600	2,000	12,400	1,000	15,400	1,200	4,800	290	11,400	640
6.0	8,400	1,100	21,200	2,800	8,300	1,120	12,700	1,700	3,200	320	8,500	770
8.0	6,400	1,200	16,000	3,000	6,400	1,200	9,600	1,800	2,400	370	6,400	900
10.0	5,100	1,360	12,800	3,400	5,100	1,360	7,700	2,000	1,900	380	5,100	920
12.0	4,200	1,400	10,600	3,500	4200	1,400	6,400	2,100	1,600	400	4,200	1,000
절입량 Depth of Cut	 • Ap : 1D • Ae : 0.2D		• Ap : 1D • Ae : 0.1D		• Ap : 1D • Ae : 0.2D		• Ap : 1D • Ae : 0.1D		• Ap : 1D • Ae : 0.2D		• Ap : 1D • Ae : 0.1D	

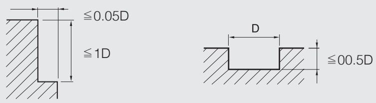
피삭재 Material	수지 Synthetic Materials	
반경 Radius	RPM	Feed (mm/min)
R0.1	37,000	50
R0.2	37,000	100
R0.3	37,000	140
R0.4	37,000	190
R0.5	32,000	210
R1.0	16,000	210
R1.5	11,000	210
R2.0	8,200	210
R2.5	6,000	250
R3.0	5,500	250
R4.0	4,100	280
R5.0	3,200	280
R6.0	2,700	330
절입량 Depth of Cut		

피삭재 Material	수지 Synthetic Materials	
외경 Outer Diameter	RPM	Feed (mm/min)
0.4	50,000	200
0.5	50,000	240
0.6	40,000	240
0.8	30,000	240
1.0	24,000	240
2.0	12,000	240
3.0	8,000	240
4.0	6,000	240
5.0	4,800	240
6.0	4,000	260
8.0	3,000	260
10.0	3,000	260
12.0	2,000	260
절입량 Depth of Cut		

피삭재 Material	탄소강/합금강 Carbon Steels/Alloy Steels		티타늄 합금/스테인레스강 Titanium Alloy/Stainless Steels		고경도강 Hardened Steels		초내열합금/인코넬 Ultra Hardened Steels/Inconel	
경도 Hardness	~45 HRc				45-55 HRc			
날직경 Cutting Dia.	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
2	6,100	120	5,300	90	3,200	40	1,500	22
3	5,300	220	4,400	100	2,400	50	1,540	28
4	4,400	220	3,700	150	2,000	80	1,300	40
6	3,200	280	2,600	200	1,500	100	1,000	50
8	2,400	300	2,000	210	1,100	110	800	45
10	1,900	2,800	1,500	210	1,000	120	700	45
12	1,500	1,500	1,300	160	800	100	550	38

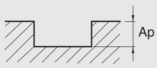
절입량 Depth of Cut

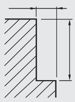
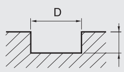
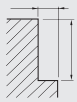
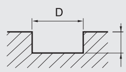


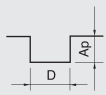
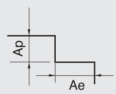


- 위의 값은 측면가공 기준임. 슬로팅 가공의 경우 RPM은 80–100%, 이송속도는 60–80%를 적용함.
- The above data are based on side milling. For slotting, apply 80-100% of the RPM and 60-80% of the feed shown on the table.

홈가공 데이터임 / Data for slot milling

피삭재 Material	합금강/공구강		고경도강/프리하든강		고경도강/스테인레스강	
	Alloy Steels/Tool Steels		Hardened Steels/Prehardened Steels		Hardened Steels/Stainless Steels	
	SKD11/SKD61/NAK		SKT/SKD/NAK55/HPM1		SUS304/SKD	
경도 Hardness	~30HRc		30 ~ 38HRc		38 ~ 45HRc	
외경 Outer Diameter	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
3.0	7,700	620	7,100	470	6,700	420
4.0	5,800	700	5,300	470	5,000	460
5.0	4,600	680	4,200	490	4,000	490
6.0	3,800	570	3,600	520	3,300	510
8.0	2,900	500	2,700	500	2,500	470
10.0	2,300	490	2,100	430	2,000	430
12.0	1,900	430	1,800	410	1,700	400
절입량 Depth of Cut	 Ap ≦1D Ap Max=12				Ap ≦0.5D	

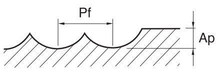
피삭재 Material	알루미늄 합금 Aluminum Alloys				알루미늄합금 주물 Aluminum Alloys			
	300m/min		240m/min		240m/min		200m/min	
	측면가공 Side Milling		홈가공 Soltting		측면가공 Side Milling		홈가공 Soltting	
외경 Outer Diamete	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
1.0	34,000	500	34000	400	34000	400	34000	300
2.0	34,000	950	32300	720	32300	720	27200	470
3.0	27,200	1,200	21300	800	21300	800	18000	510
4.0	20,400	1,300	16000	850	16000	850	14000	550
5.0	16,200	1,400	13000	850	13000	850	11000	600
6.0	13,600	1,600	11000	940	11000	940	9400	640
8.0	10,200	1,600	8000	1000	8000	1000	6800	680
10.0	8,100	1,600	6500	1000	6500	1000	5400	680
12.0	6,800	1,600	5400	1000	5400	1000	4500	680
절입량 Depth of Cut	 ≦0.2D (D< ø3) ≦0.3D (D≧ ø3) ≦1D		 D ≦1D (Max. 12mm)		 ≦0.2D (D< ø3) ≦0.5D (D≧ ø3) ≦1D		 D ≦1D (Max. 12mm)	

피삭재 Material	알루미늄 합금 Aluminum Alloys			
외경 Outer Diamete	RPM	Feed (mm/min)		
		수직 Vertical	홈절삭 Soltting	측면절삭 Side Milling
1.0	25,500	130	770	930
2.0	25,500	190	1,530	1,800
3.0	18,400	190	1,700	2,000
4.0	14,000	255	1,700	2,000
5.0	11,000	255	1,700	2,000
6.0	9,200	255	1,700	2,000
8.0	7,000	255	1,700	2,000
10.0	5,500	210	1,700	2,000
12.0	4,400	170	1,700	2,000
16.0	3,200	130	1,530	1,900
20.0	2,000	85	1,360	1,700
Milling Amount (mm)		Ap=0.75D	Ap=0.75D	Ap=0.75D / Ae=0.3D
절입량 Depth of Cut				

피삭재 Material	흑연 Graphite	
반경 Radius	RPM	Feed (mm/min)
R0.25	32,000	1,000
R0.5	32,000	1,600
R0.75	28,000	1,600
R1.0	24,000	1,600
R1.5	16,000	1,600
R2.0	12,000	1,600
R2.5	9,600	1,400
R3.0	8,000	1,200
R4.0	6,400	640
R5.0	5,200	650
R6.0	4,300	600
R5.0	3,200	280
R6.0	2,700	330

절입량 Depth of Cut

Ap	Pf
1.0D	0.3D

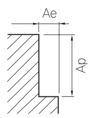


2날 평–흑연 가공용 2F Square End for Graphite 2SG

피삭재 Material	흑연 Graphite	
외경 Outer Diameter	RPM	Feed (mm/min)
2.0	8,000	250
3.0	8,000	380
4.0	8,000	510
5.0	8,000	640
6.0	8,000	770
8.0	8,000	1,000
10.0	8,000	1,250

절입량 Depth of Cut

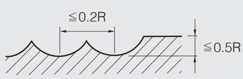
Ap	Ae
1D	0.1D

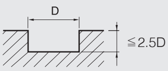


2날 볼–다이아몬드 코팅 2F Ball End-Diamond Coated 2BD

피삭재 Material	흑연 Graphite	
반경 Radius	RPM	Feed (mm/min)
R0.5	40,000	2,000
R1.0	40,000	2,200
R1.5	30,000	2,400
R2.0	24,000	2,600
R3.0	16,000	2,600
R4.0	12,000	2,800
R5.0	10,000	3,000
R6.0	8,000	3,000

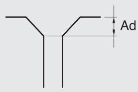
절입량 Depth of Cut



피삭재 Material	아크릴 Acrylic		합금강 Alloy Steels	
외경 Outer Diameter	RPM	Feed (mm/min)	RPM	Feed (mm/min)
1.0	32,000	2,000	23,000	1,300
1.2	32,000	2,100	23,000	1,400
1.5	32,000	2,100	23,000	1,400
2.0	32,000	2,200	23,000	1,500
2.5	28,000	2,300	21,000	1,600
3.0	25,000	2,400	18,000	1,700
4.0	20,000	2,400	15,000	1,800
6.0	13,500	2,300	10,000	1,800
절입량 Depth of Cut				

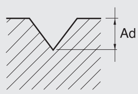
2날 센터링 2F Centering

2CE

피삭재 Material	일반구조강/탄소강 Mild Steels/Carbon Steels SS400 / SS55C		합금강/공구강 Alloy Steels/Tool Steels SKD / SCM		프리하든강 Prehardened Steels HPM/NAK(30~45HRC)		알루미늄 합금 Aluminum Alloys	
외경 Outer Diameter	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
	1,400	100	800	50	650	40	4,800	280
4	1,280	100	690	50	580	40	4,200	280
5	1,300	100	640	50	520	40	3,300	280
6	1,150	100	600	50	480	40	2,900	280
8	1,000	100	530	50	420	40	2,600	280
10	850	100	490	40	390	30	2,400	260
12	720	90	410	40	310	30	1,900	260
절입량 Depth of Cut	Ad : 0.5D~1.0D 							

2날 NC 드릴 2F NC Drill

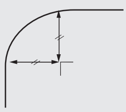
2NCD

피삭재 Material	일반구조강/탄소강 Mild Steels/Carbon Steels SS400 / SS55C		합금강/공구강 Alloy Steels/Tool Steels SKD/SUS/SCM		알루미늄 합금 Aluminum Alloys	
인선직경 Cutting Dia.	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
3.0	860	9,600	480	8,000	1,150	1,800
4.0	650	7,200	360	6,000	860	9,600
6.0	430	4,800	240	4,000	580	6,400
8.0	430	3,600	180	3,000	580	4,800
10.0	410	2,900	140	2,400	530	3,800
12.0	380	2,400	120	2,000	510	3,200
절입량 Depth of Cut	Ad < 0.3D 					

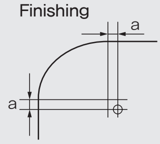
피삭재 Material	탄소강 Carbon Steels			합금강 Alloy Steels			고경도강/프리하든강 Hardened Steels/Prehardened Steels		
절삭속도 Speed	30–40m/min			20–30m/min			15–25m/min		
반경 Radius	RPM 1,400	Feed (mm/min)		RPM	Feed (mm/min)		RPM	Feed (mm/min)	
		황삭 Roughing	정삭 Finishing		황삭 Roughing	정삭 Finishing		황삭 Roughing	정삭 Finishing
0.2	12,800	50	80	9,100	40	55	7,300	30	50
0.3	11,200	50	80	8,000	40	55	6,400	30	50
0.5	8,800	50	80	6,400	40	55	5,100	30	50
0.75	7,200	50	80	5,100	40	55	4,100	30	50
1.0	5,000	50	80	3,500	40	55	3,400	30	50
1.5	3,000	50	80	2,200	40	55	2,600	30	50
2.0	2,200	50	80	1,900	40	55	2,200	30	50
3.0	2,000	50	80	1,600	40	55	1,700	30	50
4.0	1,500	50	80	1,200	40	55	1,300	30	50
5.0	1,300	50	80	960	40	55	1,000	30	50

절입량 Depth of Cut

Roughing



Finishing

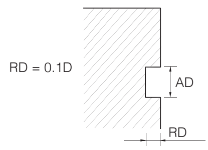


a=0.02 (R<0.5)
a=0.05 (R≧0.5)

4날 라운드 T 커터-C 4F Round T Slot Cutter-C 4RTCC

피삭재 Material	탄소강 Carbon Steels		합금강 Alloy Steels		프리하든강 Prehardened Steels	
날직경 Cutting Dia.	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
6	1430	86	950	58	720	43
8	1070	64	720	43	540	32
10	860	52	580	34	430	26

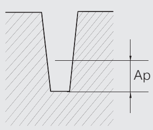
절입량 Depth of Cut



4날 테이퍼 엔드밀 4F Tapered End Mill 4TE

피삭재 Material	탄소강 Carbon Steels			합금강 Alloy Steels			고경도강/프리하든강 Hardened Steels/Prehardened Steels			고경도강/스테인레스강 Hardened Steels/Stainless Steels			고경도강 Hardened Steels		
	–750 HN/mm2			–30 HRc			30–38 HRc			39–45 HRc			46–55 HRc		
날경 Cutting Dia.	RPM	Feed (mm/min)	Ap Axial Depth	RPM	Feed (mm/min)	Ap Axial Depth	RPM	Feed (mm/min)	Ap Axial Depth	RPM	Feed (mm/min)	Ap Axial Depth	RPM	Feed (mm/min)	Ap Axial Depth
0.7	23,200	750	0.014-0.030	21,600	545	0.014-0.030	20,000	420	0.014-0.030	18,000	355	0.014-0.030	10,800	210	0.007-0.014
0.8	20,000	750	0.016-0.035	18,800	545	0.016-0.035	17,600	420	0.016-0.035	15,600	355	0.016-0.035	9,200	210	0.008-0.016
1.0	16,000	745	0.02-0.045	15,200	545	0.02-0.045	14,000	420	0.02-0.045	12,400	355	0.02-0.045	7,600	210	0.01-0.02

절입량 Depth of Cut



스타공구(주)
Star Tool Co., Ltd.

재연마 단가표

2015. 10.

SPEED-1

ST

▶ 초경 BALL E/M, 코너R E/M

	비코팅		코팅	
	2날	3, 4, 6날	2날	3, 4, 6날
6 이하	5,500	7,500	7,500	9,300
10 이하	6,000	8,500	8,600	11,300
12 이하	7,000	10,000	9,900	12,100
16 이하	9,000	11,000	12,100	13,800
20 이하	12,000	15,000	17,300	21,600
25 이하	15,000	20,000	19,000	24,000
32 이하	35,000	45,000	–	–

* 부등분할일때 가격 × 1.1 * NACO코팅 가격동일 * 특수코팅(H • C) x 1.2

▶ 초경 E/M 절단 및 밑날

	비코팅		코팅	
	2날	3, 4, 6날	2날	3, 4, 6날
6 이하	3,800	4,800	4,300	5,200
10 이하	4,300	5,300	4,700	5,700
12 이하	5,800	6,800	6,400	7,700
16 이하	7,700	9,700	9,100	11,200
20 이하	9,700	11,100	11,200	12,500
25 이하	12,600	15,500	13,800	16,500

* 다이아 × 2 * 부등분인 경우 가격 × 1.1 * 초경 ROUGHING 절단및 밑날인 경우 가격 × 1.1 * 특수코팅(H • C) x 1.2

▶ 초경 E/M (외경연삭)

LONG × 1.2 EX LONG × 1.5

날경	6 이하	12 이하	16 이하	20 이하	25 이하	30 이하
2날	4,400	5,500	7,700	11,000	16,500	23,100
4날	5,500	6,600	8,800	13,200	19,800	27,500

* 부등분할인 경우 가격 × 1.5 * 절수(=절단수리) 작업시 가격 × 1.5

▶ HSS E/M (외경연삭 또는 절단만)

LONG × 1.5 EX LONG × 2

날경	20 이하	30 이하	40 이하	50 이하
2날	3,300	4,400	7,700	13,200
4날	4,400	5,500	8,800	16,500

* 절수 작업시 가격 × 1.5 * 수리 작업시 가격 × 2 * 절단+밑날 x 1.5

A.치수 지정(맞추는 경우) = 절수가격 적용
B.수리는 골수리, 절단, 뒷니방 중 2개이상 적용시 수리청구

▶ HSS ROUGHING E/M (외경연삭)

LONG × 1.5　EX LONG × 2

날경	20 이하	30 이하	40 이하	50 이하
	4,400	5,500	7,700	9,900

* 절수작업시 가격 × 1.5　* CR추가시 +5,000　* 절단+밑날 x 1.5

▶ 초경 ROUGHING E/M (외경연삭)

LONG × 1.5　EX LONG × 2

날경	10 이하	12 이하	16 이하	20 이하
	11,000	11,000	13,200	17,600

* 절수작업시 가격 × 1.5　* CR추가시 +5,000

▶ 날붙이(BG)초경 E/M(외경연삭)

LONG × 1.5　EX LONG × 2

날경	20 이하	30 이하	40 이하	50 이하
2날	5,500	8,800	11,000	16,500
4날	6,600	9,900	13,200	22,000

뒷니방작업=절수적용　　* 절수작업시 가격 × 1.5　* 절단+밑날 x 1.5

▶ 초경 TAPER E/M (외경연삭)

LONG × 1.5

TAPER	TAPER 생크경(∅)							
	∅6	∅8	∅10	∅12	∅16	∅20	∅25	∅32
2° 미만	9,900	11,000	12,100	13,200	16,500	22,000	27,500	33,000
2° 이상	9,900	11,000	13,200	15,400	19,800	26,400	30,800	35,200
30° 이상	6,600	7,700	8,800	9,900	12,100	16,500	20,900	27,500

** 소치수없는 45°이상 **　* 30°미만 NC수리제작 × 2　* 30°이상 45°미만 x 1.5　* 역 × 1.5　* 역제작수리 × 2.5

▶ HSS TAPER E/M

LONG × 1.5

TAPER	TAPER 생크경(∅)				
	16 이하	20 이하	25 이하	32 이하	35이상
2° 이하	7,700	8,800	9,900	13,200	16,500
2° 이상	8,800	11,000	13,200	16,500	19,800
30° 이상	6,600	7,700	8,800	11,000	13,200

* 수리제작 작업시 가격 × 2　* 역 작업시 가격 × 1.5

▶ 히다찌 BALL & 코너R 인서트

	비코팅시	코팅시
R6 × 12, 13	6,000	10,000
R8 × 16, 17	7,000	12,000
R10 × 20, 21	8,000	13,000
R12.5 × 25, 26	9,000	14,000
R15 × 30	12,000	17,000

▶ 중간원통

초경		HSS	
6 이하	2,000	20 이하	2,000
12 이하	3,000	25 이하	2,500
20 이하	8,000	30 이하	3,000
32 이하	10,000	40 이하	5,000
		50 이하	8,000

▶ HSS DRILL(NC DRILL)

규격	6 이하	10 이하	15 이하	20 이하	25 이하
단가	2,500	3,000	4,000	6,000	7,000
규격	30 이하	35 이하	40 이하	45 이하	50 이하
단가	8,000	10,000	15,000	20,000	25,000

* 수리 X 2

▶ 초경 DRILL(초경 NC DRILL)

규격	4 이하	6 이하	8 이하	10 이하	12 이하
단가	3,000	3,500	5,000	6,000	7,000
규격	14 이하	16 이하	20 이하	25 이하	
단가	9,000	12,000	15,000	20,000	

* 수리 X 2

▶ 초경 DRILL(연마+코팅)

규격	5 이하	6 이하	7 이하	8 이하	10 이하	12 이하	13 이하	14 이하
단가	4,300	5,000	6,000	7,000	9,000	11,000	12,000	13,000
규격	15 이하	16 이하	17 이하	18 이하	20 이하	22 이하	25 이하	30 이하
단가	14,000	16,000	17,000	18,000	20,000	22,000	25,000	30,000

▶ 카운터 싱크

날경	10 이하	20 이하	30 이하	40 이하	50 이하
연마	7,000	9,000	12,000	15,000	20,000
연마 + 코팅	10,000	13,000	16,000	20,000	27,000

▶ BG 초경 B/E(BG초경 볼엔드밀)

	2날	3, 4, 6날
6 이하	7,900	10,700
10 이하	8,600	12,200
12 이하	10,000	14,300
16 이하	12,900	15,700
20 이하	17,200	21,500
25 이하	21,500	28,600

▶ HSS BALL

	2날	3, 4, 6날
10 이하	5,000	6,000
16 이하	6,000	7,000
20 이하	8,000	10,000
25 이하	10,000	13,000
32 이하	15,000	18,000
40 이하	20,000	25,000
50 이하	30,000	40,000

▶ T–C수리

10 이하	12 이하	16 이하	20 이하	25 이하	32 이하
10,000	12,000	16,000	20,000	25,000	32,000

▶ 초경 ROUGHING 래디우스(밑날)

날경	10 이하	12 이하	16 이하	20 이하
2날	7,000	8,000	11,000	14,000
4날	8,000	9,000	13,000	18,000

▶ 초경 하이 헬릭스 H–E/M (외경연삭)

LONG × 1.2 EX LONG × 1.5

날경	10 이하	12 이하	16 이하	20 이하	25 이하	32 이하
6날	11,000	13,200	16,500	19,800	30,800	36,300

* 절수 작업시 가격 × 1.5

▶ 역R E/M

규격	–R1 ~ –R5	–R6	–R7	–R8	–R10	–R15
2날	10,000	12,000	15,000	18,000	20,000	25,000
4날	12,000	15,000	20,000	25,000	30,000	35,000

▶ HSS 래디우스

날경	10 이하	16 이하	20 이하	25 이하	32 이하	42 이하	50 이하
2날	7,000	8,000	10,000	12,000	20,000	30,000	40,000
4날	8,000	10,000	12,000	15,000	25,000	40,000	50,000

* 수리(외경연마) X 1.5

▶ 초경 베르밀(CR)

날경	10 이하	12 이하	16 이하	20 이하
2날	7,000	8,000	10,000	14,000
4날	8,000	9,000	12,000	18,000

▶ 초경 E/M 수리제작(코팅포함)

초경 E/M 수리제작 *4F X 1.2		초경 B/E 수리제작	
4*11L	8,000	R3*12L	10,000
5*13L	8,000	R4*14L	12,000
6*15L	8,000	R5*18L	15,000
8*20L	10,500	R6*22L	18,000
10*22L	13,000	R8*30L	38,000
12*25L	16,000	R10*40L	63,000
14*30L	22,000		
16*30L	30,000		

▶ 초경 B/E 수리제작(흑연용)–코팅포함

R3*20L	R4*25L	R5*30L	R6*30L	R8*30L	R10*40L
12,500	18,500	23,000	25,000	38,000	68,000

▶ 초경 E/M 코팅단가(NACO, AlTiN 코팅)

6 이하	8 이하	10 이하	12 이하	16 이하	20 이하	25 이하	32 이하
1,800	2,200	3,000	4,000	7,500	9,000	13,000	18,000
1,440	1,760	2,400	3,200	6,000	7,200	10,400	14,400

[×0.8]

▶ 초경 E/M 코팅단가(HARD 코팅)

6 이하	8 이하	10 이하	12 이하	16 이하	20 이하	25 이하	32 이하
2,160	2,640	3,600	4,800	9,000	10,800	15,600	21,600
1,700	2,100	2,800	3,800	7,200	8,600	12,400	17,200

[×0.8]

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